

TEMPLATE

MONITORING REPORT

PUBLICATION DATE **14.10.2020**

VERSION **v. 1.1**

RELATED SUPPORT – **TEMPLATE GUIDE Monitoring Report v. 1.1**

This document contains the following Sections

Key Project Information

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KEY PROJECT INFORMATION

GS ID (s) of Project (s)	GS11207
Title of the project (s) covered by monitoring report	Multi-Layer Household Water Filtration System in Kenya
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	06
Version number of the monitoring report	05
Completion date of the monitoring report	10/02/2022
Date of project design certification	17/11/2021
Date of Last Annual Report	N/A
Monitoring period number	1 st
Duration of this monitoring period	The 1 st monitoring period, first and last days included (10/10/2020 to 31/07/2021)
Project Representative	The official focal point and developer: Profit Carbon Environmental Energy Technology (Shanghai) Co., Ltd. Project owner: Climate Neutral Kenya Limited
Host Country	Republic of Kenya
Activity Requirements applied	<input checked="" type="checkbox"/> Community Services Activities <input type="checkbox"/> Renewable Energy Activities <input type="checkbox"/> Land Use and Forestry Activities/Risks & Capacities <input type="checkbox"/> N/A
Methodology (ies) applied and version number	<i>Methodology for Emission Reductions from Safe Drinking Water Supply (Version 1.0)</i>
Product Requirements applied	<input checked="" type="checkbox"/> GHG Emissions Reduction & Sequestration <input type="checkbox"/> Renewable Energy Label <input type="checkbox"/> N/A

TABLE 1 - SUSTAINABLE DEVELOPMENT CONTRIBUTIONS ACHIEVED

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
SDG13 Climate Action (mandatory)	Emissions Reductions	282,570	tCO ₂ e
SDG6 Clean Water and Sanitation	Total number of person.days served with satisfactory level of safe water	439,983,061	Person.days
SDG7 Affordable and Clean Energy	Number of water purifiers sold each year	467,123	Units
SDG8 Decent Work and Economic Growth	Number of males and females employed by the project	12 jobs created including 6 males and 6 females	
SDG8 Decent Work and Economic Growth	Percentage of employees with salaries paid at par with the average wage of Kenya ¹ .	100	%

TABLE 2 – PRODUCT VINTAGES

SDG13		Amount Achieved
Start Dates	End Dates	VERs(tCO ₂ e)
10/10/2020	31/12/2020	59,586
01/01/2021	31/07/2021	222,984

SDG7		Amount Achieved
Start Dates	End Dates	Number of water purifiers sold (Units)
10/10/2020	31/12/2020	467,123
01/01/2021	31/07/2021	0

¹ <http://www.salaryexplorer.com/salary-survey.php?loc=111&loctype=1#:~:text=A%20person%20working%20in%20Kenya%20typically%20earns%20around%20147%2C000%20KES,%2C%20transport%2C%20and%20other%20benefits.>

The average salary is 147,000KES, the average salary of employee in proposed project is 235,000 KES which higher than 147,000KES, so the Percentage of employees with salaries paid at par with the average wage of Kenya is 100%.

SDG6		Amount Achieved
Start Dates	End Dates	Total number of person.days served with satisfactory level of safe water(person.days)
10/10/2020	31/12/2020	92,724,201
01/01/2021	31/07/2021	347,258,860

SDG8		Amount Achieved
Start Dates	End Dates	Number of males and females employed by the project
10/10/2020	31/12/2020	12 jobs created including 6 males and 6 females
01/01/2021	31/07/2021	12 jobs created including 6 males and 6 females

SDG8		Amount Achieved
Start Dates	End Dates	Percentage of employees with salaries paid at par with the average wage of Kenya
10/10/2020	31/12/2020	100%
01/01/2021	31/07/2021	100%

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SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

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The Multi-Layer Household Water Filtration System in Kenya (hereinafter referred to as “the project”) is implement in Kenya. The project will be sold 644,850 water purifiers to residents in Makueni County, Trans Nzoia County, Kirinyaga County, Bungoma County and Nakuru County of Kenya. The water purifiers of the project will offer an affordable, long-term and zero emission solution for households that generally consume unsafe drinking water. It will not only dramatically increase access to safe drinking water but also reduce consumption for woody fuels previously required to treat drinking water, which will decrease environmental degradation and greenhouse gas emissions.

It is estimated that about 644,850 water purifiers will be sold and about 2.5149 million people would have access to clean water during the first crediting period. 459,638 tCO₂e emission reductions will be produced annually and the total emission reductions during the first crediting period is 2,298,193 tCO₂e.

This monitoring period for the project is 10/10/2020²-31/07/2021, which is the first monitoring period. In this monitoring period, the total number of water purifiers sold is 467,123. The total emission reductions achieved in this monitoring period is 282,570 tCO₂e.

A.2. Location of project

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The project crosses five counties of Kenya (Kenya has a latitude of 0.0236° S, and longitude of 37.9062° E³), including Makueni County (1°48’S and 37°37’E), Trans Nzoia County (1°6’N and 34°57’E), Kirinyaga County (0°30’S and 37°17’E), Bungoma County (0°34’S and 34°34’E) and Nakuru County (0°18’S and 36°4’E). The location of the project is illustrated in Figure 1.

² The start date of crediting period is the start date of project or two years prior to the date of Project Design Certification, whichever is later. The Start date of project is 09/10/2020, the date of Project Design Certification is 17/11/2021, so the Start date of crediting period should be the start date of project, i.e., 09/10/2020. However, although the project start date is 09/10/2020, and according to “summary table of Usage rate survey”, among the users surveyed, there are users who used it on the day of purchase. While, based on conservative considerations, in the calculation of emission reductions, it is considered that the water purifiers are used on the second day of purchase, so the start date of credit period is 10/10/2020.

³ <https://worldpopulationreview.com/country-locations/where-is-kenya>

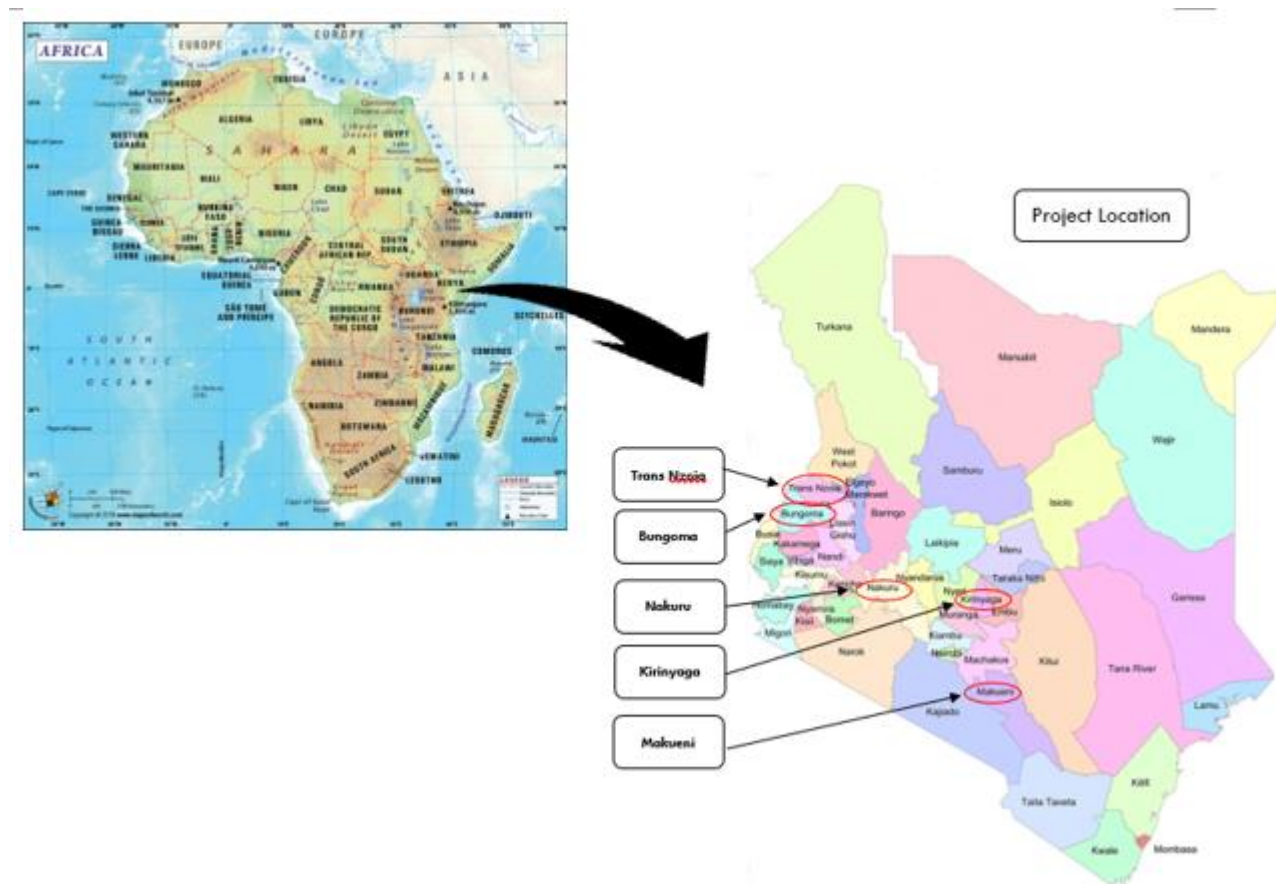


Figure 1 The Geographic Location of the project

A.3. Reference of applied methodology

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Methodology for Emission Reductions from Safe Drinking Water Supply (Version 1.0) is applicable to the project. The methodology can be obtained from the following URL:

<https://globalgoals.goldstandard.org/429-ee-sws-emission-reductions-from-safe-drinking-water-supply/>

A.4. Crediting period of project

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Start date of crediting period: 10/10/2020

End date of crediting period: 09/10/2025

Total length of crediting period: 5 years renewable (two renewal cycles and in total 15 years).

Expected operational lifetime of the project: 15 years⁴.

⁴ According to the technical manual of the Water Purifier, the Technical life of equipment is no less than 15 years.

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

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The project owner (Climate Neutral Kenya Limited) invested in purchasing the Multi-Layer water purifiers produced by Zhejiang Duanqi Renewable Energy Co., Ltd., and sold the Multi-Layer water purifiers in Makueni County, Trans Nzoia County, Kirinyaga County, Bungoma County and Nakuru County of Kenya. For this project, the sold of water purifiers started on 09/10/2020 which is the date of Sales contract signed between the project and the End-user and the date of implementation of the first water purifiers. The sales plan for the first year was completed within two months. So, all water purifiers involved in this monitoring period have the same age. The current monitoring period is the first monitoring period.

The main action made for the project implementation during this motoring period are generalized in the following:

Table 1 The main action made for the project implementation

Time	Milestone
07/08/2020	Completion of the project proposal (Including sales plan for the water purifiers and prior consideration of carbon revenue).
25/08/2020	Conducted business management meeting determining to apply for Gold Standard certification of this project.
09/10/2020	Start date of the project (first purchase receipt for the water purifier sold to an end-user).
15/10/2020	The Monitor staff training time
25/05/2021	The Monitor staff training time

The proposed project involves in sold Multi-Layer water purifiers in Makueni County, Trans Nzoia County, Kirinyaga County, Bungoma County and Nakuru County of Kenya. The Multi-Layer water purifiers will displace the use of woody fuels traditionally used to treat drinking water. The water filtration system requires no energy input or consumables, so, the Multi-Layer water purifiers is not only dramatically increase access to safe drinking water but also reduce consumption for woody fuels previously required to treat drinking water, which will decrease environmental degradation and greenhouse gas emissions. For this project, the sold of Multi-Layer water purifiers started on 09/10/2020 and the sales plan of the first year was completed within two months, so all Multi-Layer water purifiers involved in this monitoring periods have the same age.

The Multi-Layer water purifiers involve in this project consist of 8 step filtration system and can purify water 3 liter/hour. The lifespan of the water purifiers are over 15 years and the dome ceramic, carbon cartridge and mineral stone should be changed when purify every 10,000 L

water. A whole set of the alternative dome ceramic, carbon cartridge and mineral stone will be supplied to the end-users together with the water purifiers. All the alternative filtration system can be changed easily and will not affect the usage of the water purifiers on that day. Considering carbon revenue of the project, some alternative materials needed will be provided by the project owner for free, such as Dome ceramic filter, Mineral stone, Granular activated carbon, Silica sand, Zeolite, Magnetic Water Tap.

The Step Filtration System in the project are listed below:

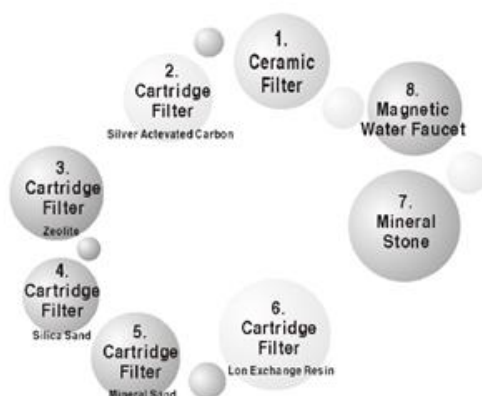


Figure 2 Step Filtration System

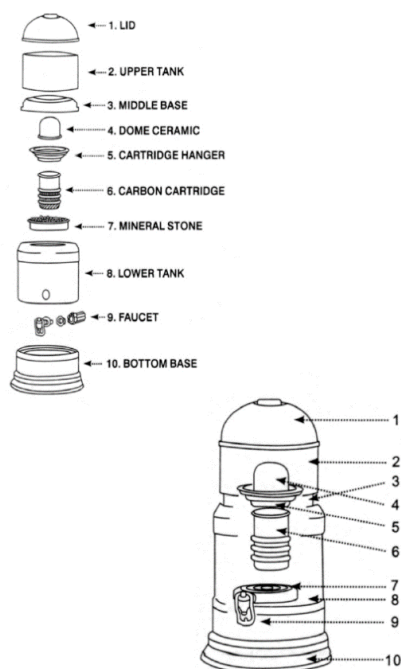


Figure 3 Components of the Water Purifier



Figure 4 Examples of the Water Purifier engaged in the project

The water purifier sold in this project has a unique number, and during use, due to the quality of the water purifier itself, the project owner is responsible for the replacement of parts and other alternative materials to maintain the normal use of the water purifier. The actual operation situation of this monitoring period has no change comparing with the PDD.

B.1.1. Forward Action Requests

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As this monitoring period is the 1st monitoring period, so this part should describe the "Declare any Forward Action Requests from Design certification". The specific description is as follows:

FAR#1: During verification, the PP must demonstrate that the project area does not overlap with that of another Gold Standard or other voluntary or compliance standard programme of a similar nature. E.g., if the household use water from boreholes which the clean water is claimed by existing carbon project, that same amount of water will be double counted under this project activity.

Reply: In order to avoid the double counting and the overlap with that of another Gold Standard or other voluntary or compliance standard programme of a similar nature. When the water purifier was sold, the user's related information (include the date of sale, Geographic area of sale, Model/type of project technology sold and unique water purifier serial number, Mode of use: commercial, institutional, domestic and other, Number of water purifiers sold, Name, telephone number and address) will be recorded, see the "Database of Sales Record" for details. For the water purifiers sold by the project, the cross-serial number is not allowed between different projects and each project has a unique serial number naming rule. Furthermore, each water purifier also has its unique serial number, if there are other water purifier that don't belong to the proposed project was used within the project boundary, these water purifiers will not have the unique serial number and will not be taken into account.

Also, from the project survey, the end users are Investigated whether to participant in another Gold Standard or other voluntary or compliance standard programme of a similar nature and the source of drinking water that is usually collected. The results showed that project users did not participate in another Gold Standard or other voluntary or compliance standard programme of a similar nature, and the water source is a nearby river, so the end users involved in this project will not overlap with that of another Gold Standard or other voluntary or compliance standard programme of a similar nature.

FAR#2: The VVB shall verify the replacement for the core filters after their lifetime and the availability of the spare filter at user premises.

Reply: The full original version of technical manual of water filter manufacturer has been provided to VVB, and from this document, it can be confirmed that the technology of the water purifier involved in this project is over 15 years.

FAR#3: The VVB shall randomly visit and interview the retailers from the list of retailers that provided by PP during Design Certification to verify the date, number of sales, procedure of recording the sales to PP's database.

Reply: For this project, Climate Neutral Kenya Limited took advantage of the sales network that TRIOPT AFRICA LIMITED had built and delegated the sales work to TRIOPT AFRICA LIMITED, with their help, achieved gratifying sales performance. The specific sales model of this project is

as follows: In areas with relatively prosperous economy, such as main urban areas and counties, TRIOPT has set up special sales points to sell products directly. In relatively remote townships and rural areas where the economy is slightly underdeveloped, the sales work was conducted by using the distribution network (for example, township convenient stores, rural shops) established by TRIOPT, i.e., using the local resellers developed by TRIOPT to sell the water purifiers.

For the specific assignments, TRIOPT designated its five staff with professional sales experience as sales manager to respectively take charge of the sales of water purifiers in above five counties by means of the distribution network and connections established and obtained by Triopt in telecom industries over the years. The retailer instructions and the reseller list has been provided to VVB and all the information has been verified by the VVB.

B.2. Post-Design Certification changes

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B.2.1. Temporary deviations from the approved Monitoring & Reporting Plan, methodology or standardized baseline

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None.

B.2.2. Corrections

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None.

B.2.3. Changes to start date of crediting period

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None.

B.2.4. Permanent changes from the Design Certified monitoring plan, applied methodology or applied standardized baseline

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None.

B.2.5. Changes to project design of approved project

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None.

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

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According to section B.7.1 of the PDD, there are fourteen parameters to be monitored:

- (1) Water hygiene education campaigns.
- (2) Number of water purifiers sold in year y .
- (3) Ongoing water quality indicated as the fraction of the samples that pass microbial quality standard requirements specified in relevant microbial quality standard for drinking water of the host country (KS EAS 153: 2018 East African Standard Specification for Packaged Drinking Water), $M_{q,y}$;
- (4) Number of individuals per premises type p in the project boundary in year y , $HN_{p,y}$;
- (5) Accumulated number of premises type p with at least one individual project technology in year y , $N_{p,y}$.
- (6) Average days the project technology is present for end-users in the premises p in year y , $DP_{p,y}$.
- (7) Usage rate of the project technology by premises type p during year y , $U_{p,y}$.
- (8) Volume of drinking water per person per day for premises type p , QPW_p .
- (9) Average number of individual project technologies in each project premises type p in year y , $DN_{p,y}$.
- (10) Usage time of the project technology by premises type p in year y , $t_{p,y}$.
- (11) Proportion of project households that boil safe (treated, or from safe supply) water after installation of project technology in year y , $X_{cleanboil,y}$.
- (12) Leakage emissions during year y , LE_y .
- (13) Number of males and females employed.
- (14) Percentage of employees with salaries paid at par with the average wage of Kenya.

For parameter 2 and parameter 5: Number of water purifiers sold in year y and Accumulated number of premises type p with at least one individual project technology in year y . According to sales database, PP can obtain those two parameters.

For parameter 6: Average days the project technology is present for end-users in the premises p in year y . According to sales database, PP can know the sales date of the water purifier equipment, and then get the actual operating days of every equipment during the monitoring period. The average days the project technology is present for end-users can be calculated by the sum of the actual operating days of each water purifier divided by the total number of water purifiers.

For parameter 9: Average number of individual project technologies in each project premises type p in year y . As description in PDD, to cover more households with high-quality water purifiers at a lower price, it is restricted in the project that each household can only buy one set of water purifier. Also, according to sales database, Average number of individual project technologies in each project premises is 1.

For parameter 10: Usage time of the project technology by premises type p in year y , according to applied methodology and PDD, value(s) applied of this parameter is default of 5 hours.

For parameter 12: Leakage emissions during year y , according to the applied methodology, If the ex-ante evaluation shows that leakage emissions are less than 5% of total emission reductions, then no monitoring is needed, and emission reductions simply shall be adjusted 5% down. In the PDD, the leakage emissions are less than 5% of total emission reductions, so, the leakage emissions in this monitoring period are 5% of the total emission reduction.

For parameter 13: the number of males and females employed by this project, according to employment records or labor contract signed with employee, 12 jobs (including 6 females and 6 males) for local people were created in the 1st monitoring period.

For parameter 14: the percentage of employees with salaries paid at par with the average wage of Kenya, according to the employment records or Payroll, the salary of all employees is higher than or equal to the Kenyan average salary.

Above all, the monitoring system only need to address the monitoring of Water hygiene education campaigns, $M_{q,y}$, $HN_{p,y}$, $U_{p,y}$, QPW_p and $X_{cleanboil,y}$. Below is the organization structure of the monitoring system for the related parameters.

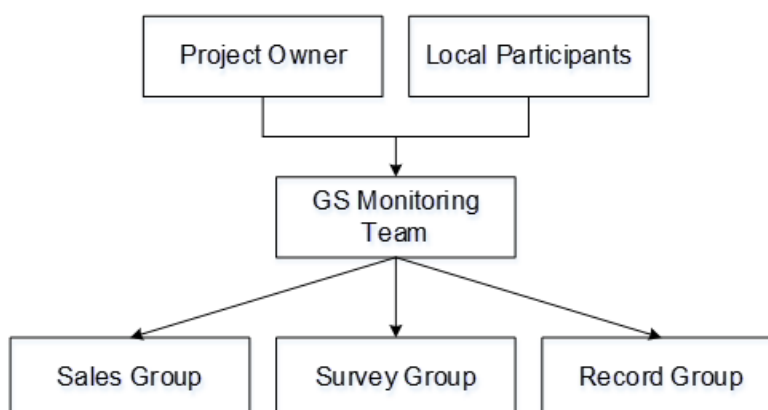


Figure 5 The organization of the project monitoring

Responsibility of each group are summarized as follows:

Local participants: For this project, the local participant is-TRIOPT AFRICA LIMITED⁵, which is a subsidiary of TAL HOLDING LIMITED (one of the funders of the project owner CNKL). Based on the trend of common interests and trust, a better internal communication mechanism will be more conducive to the development of sales and develop the project as an emission reduction project under the GS mechanism.

TRIOPT AFRICA LIMITED is a subsidiary under TAL HOLDING LIMITED, which is an independent, ambitious and fast growing in African telecom sector. It has years of professional distribution experiences in telecom industry within East Africa across Kenya, Tanzania, Uganda, Rwanda and Mozambique. TAL HOLDING LIMITED had cooperated with ROTOR ENERGY TECHNOLOGY CORPORATION LIMITED to carry out Akon Lighting Africa Initiative, which covered 25 African counties, provided solutions to the energy poverty in rural areas in Africa through innovative, clean and accessible solar solutions. The shareholding structure is as follows:

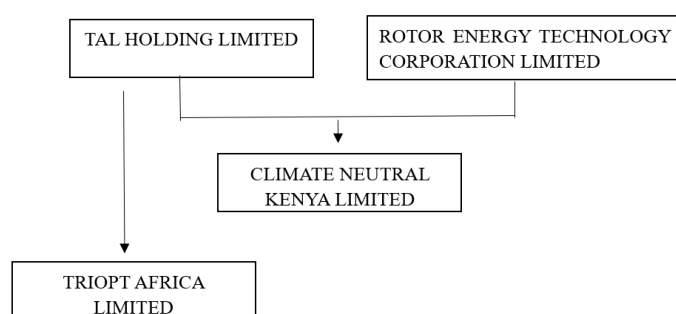


Figure 6 The shareholding structure of the project owner and local participant

For this project, Climate Neutral Kenya Limited took advantage of the sales network that TRIOPT AFRICA LIMITED had built and delegated the sales work to TRIOPT AFRICA LIMITED, with their help, achieved gratifying sales performance. The specific sales model of this project is as follows: In areas with relatively prosperous economy, such as main urban areas and counties, TRIOPT has set up special sales points to sell products directly. In relatively remote townships and rural areas where the economy is slightly underdeveloped, the sales work was conducted by using the distribution network (for example, township convenient stores, rural shops) established by TRIOPT, i.e., using the local resellers developed by TRIOPT to sell the water purifiers. At the same time, each county will establish a sales management center to be responsible for statistics and analysis of sales in each county, and to solve various problems from the sales process.

No matter what kind of sales model, at a time of water purifier pick up, the end user signs a sales contract with the project owner to give up carbon emission ownership and get a receipt issued by the seller. The contract and a copy of this receipt are kept by project owner. The sales

⁵ TRIOPT AFRICA LIMITED is a subsidiary of TAL HOLDING LIMITED, the project owner CNKL is established by TAL HOLDING LIMITED cooperated with ROTOR ENERGY TECHNOLOGY CORPORATION LIMITED, so the TRIOPT AFRICA LIMITED and the project owner CNKL has the same investor.

management center picks up the sales contract and summarizes the information of end users on the contracts weekly.

In addition, when the product is sold, the salesperson will record the buyer's information (such as name, gender, age, address etc.) and the water purifier serial number. The project record adopts a sales management system, which can perform real-time numbering according to the order of sales of water purifiers and can generate the excel sheet of Sales Record Database.

Sales group: Maintain and updated the sales database in a timely manner. The project proponent must maintain an accurate and complete electronic database for enabling the unique identification of the project water purifiers. It is envisaged that the database will include at least the following information:

- Date of sale
- Geographic area of sale
- Model/type of project technology sold and unique water purifier serial number
- Mode of use: commercial, institutional, domestic and other
- Number of water purifiers sold
- Name, telephone number and address.

Survey group: To carry out project survey, usage survey, water quality survey test and hygiene practices assessment.

Record group: Data verification and filing and managing the project documents.

Specifically, there were monitoring teams for the monitoring of Water hygiene education campaigns, $M_{q,y}$, $HN_{p,y}$, $U_{p,y}$, QPW_p and $X_{cleanboil,y}$. For the details monitoring process implemented of the monitoring parameters please refer to the table below.

Table 2 The details Monitoring Process of the monitoring parameters engaged in the project

Monitoring Plan in PDD	Monitoring Process Implemented
<p>For water hygiene education campaigns:</p> <p>B.7.3.4 of PDD: The drinking water and hygiene practices will be assessed using the WHO/UNICEF Joint Monitoring Programme guidelines (JMP 2018). In-person or telephone or by messaging based survey including all the JMP core questions for drinking water and core questions for hygiene will be conducted.</p> <p>B.7.2.5 of PDD:</p>	<p>For water hygiene education campaigns:</p> <p>A serial number was put on each of Multi-Layer water purifiers sold to the users. A list of all the users and the corresponding serial numbers of their Multi-Layer water purifiers was kept.</p> <p>The sold of Multi-Layer water purifiers started on 09/10/2020 and sales plan for the first year was completed within two months and completed on 30/11/2020. So, all water purifiers involved in</p>

<p>This parameter can be conducted with water Quality Testing using the same sample and the calculation of the sample size for the monitoring shall be based upon a 0.6 Coefficient of Variation (COV) under a 90/10 approach as provided in Table 3 of Annex 4 of TPDDTEC (Version 3.1).</p>	<p>this monitoring period have the same age. As the calculation of the sample size in PDD. The sample size for water hygiene education campaigns is 101. 101 samples were randomly selected from 467,123 water purifiers users using MS Excel software by the Survey Group at the beginning of 2021⁶.</p> <p>The monitoring of this parameter was conducted by GS monitoring team, which consisted of sales group, survey group and record group. All the team members were properly trained on 15/10/2020 and 25/05/2021, so that they were fully aware of the monitoring procedures and the conservative principle.</p> <p>The hygiene education campaigns, and water Quality Testing have been conducted together on 02/06/2021-11/06/2021 during the monitoring team member visiting to end-user' homes to take water quality samples for water Quality Testing. The monitoring team member conducted in-person survey including all the JMP core questions for drinking water and core questions for hygiene and ask them to fill the questionnaires.</p> <p>Samples of survey questionnaires, photos of in-person survey and hygiene education campaigns have been taken as evidence.</p> <p>The result from the Hygiene survey in this monitoring period is: the fraction of the households where safe water is found to fulfill "safely managed" is 100%, i.e., All the project users have access to safe water because they have water purifiers; The fraction of the households where Hygiene practices are found to fulfill basic requirements is 7.92%, i.e.,</p>
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⁶ Since the monitoring period of this project covers only 3 months in 2020, and all the water purifiers put into operation on 01/12/2020. Also, this monitoring period is only 10 months, less than a year, so the 101 samples in 2021 can be representative the entire monitoring period. In addition, the water hygiene campaign and water Quality Testing can be conducted together, and the date requirement of the water Quality Testing is at least six months after the project start date, so the water hygiene campaign conducted in June 2021 is reasonable.

	Among the 101 sample users surveyed, 8 users can get soap when washing their hands at home.
<p>For ongoing water quality indicated as the fraction of the samples that pass microbial quality standard requirements specified in relevant microbial quality standard for drinking water of the host country (KS EAS 153: 2018 East African Standard Specification for Packaged Drinking Water), $M_{q,y}$:</p> <p>B.7.3.4 of PDD:</p> <p>The quality of the treated water will be assessed to ensure that it is fit for human consumption. Water quality test will be conducted based on section E of Annex 3 of TPDDTEC (Version 3.1). Accredited laboratory will be used to conduct the water quality test based on WHO standard of less than 1 Colony Forming Unit (CFU) of E.Coli/100 ml and the Quality Standards for Sources of Domestic Water of The Environmental Management And Co-Ordination (Water Quality) Regulations, 2006 .</p> <p>The laboratory used must demonstrate that it has an adequate quality management plan in place which addresses both quality assurance and quality control test procedures. Field testing kits also are eligible, e.g., based on Colony Forming Unit method or Most Probable Number method. To use the field testing kits the project shall meet the following requirements: Testing kits must be approved by national agency or meet standards set by relevant international organization e.g., US-EPA, or testing kits shall be tested for its accuracy and robustness prior to application for project level monitoring. Local or accredited laboratory shall conduct water quality tests</p>	<p>For ongoing water quality indicated as the fraction of the samples that pass microbial quality standard requirements specified in relevant microbial quality standard for drinking water of the host country (KS EAS 153: 2018 East African Standard Specification for Packaged Drinking Water), $M_{q,y}$:</p> <p>A serial number was put on each of Multi-Layer water purifiers sold to the users. A list of all the users and the corresponding serial numbers of their Multi-Layer water purifiers was kept.</p> <p>The sold of Multi-Layer water purifiers started on 09/10/2020 and sales plan for the first year was completed within two months. So, all water purifiers involved in this monitoring period have the same age. As the calculation of the sample size in PDD. The sample size for water hygiene education campaigns is 101. 101 samples were randomly selected from 467,123 water purifiers users using MS Excel software by the Survey Group at the beginning of 2021⁷.</p> <p>The monitoring of this parameter was conducted by GS monitoring team, which consisted of sales group, survey group and record group. All the team members were properly trained on 15/10/2020 and 25/05/2021, so that they were fully aware of the monitoring procedures and the conservative principle.</p>

⁷ Since the monitoring period of this project covers only 3 months in 2020, and all the water purifiers put into operation on 01/12/2020. Also, this monitoring period is only 10 months, less than a year, so the 101 samples in 2021 can be representative the entire monitoring period. In addition, the water hygiene campaign and water Quality Testing can be conducted together, and the date requirement of the water Quality Testing is at least six months after the project start date, so the monitoring activities conducted in 2021 is reasonable.

<p>using testing kits and a relevant ISO standard or an equivalent standard, in parallel with field testing kits. The water test results will be compared against values provided for different parameters under the manufacturer's specifications of the project technologies.</p> <p>The water quality must be tested annually, and the first round of testing shall be conducted at least after six months from the start date. The monitoring report may include:</p> <ul style="list-style-type: none"> -A full description of the water quality process which may be conducted either in the field or by transportation to laboratories. -Endorsement by third parties of the testing. -Justification of the appropriateness of the testing approach. <p>B.7.2.4 of PDD:</p> <p>The sample size is following 90/10 precision rule and the water sample is taken at water outlet randomly from project database. The calculation of the sample size for the test shall be based upon a 0.6 Coefficient of Variation (COV) under a 90/10 approach as provided in Table 3 of Annex 4 of TPDDTEC (Version 3.1).</p>	<p>The water Quality Testing have been conducted on 02/06/2021-11/06/2021⁸⁹ by the monitoring team member with Water sampler visiting to end-user' homes to take water quality samples for water Quality Testing.</p> <p>The specific sampling process are:</p> <p>Fill a numbered (which can identify the source of the sample) sterilized sampling bottle with water from outlet of the water purifier. Avoid contamination of the mouth with fingers and other objects during sampling. After sampling, the samples were stored at low temperature (0~4℃) and protected from light. Water quality samples have been sent to the laboratory for water quality monitoring and analysis immediately after the completion of water quality collection.</p> <p>Entrust a qualified third-party testing agency-a microbiology laboratory affiliated with the Kenya Bureau of Standards (KEBS) ¹⁰to test the water quality, which is official organization with the ability to issue qualifications to other institution. so, the KEBS has the undoubted accreditation.</p> <p>Sampling photos and test results report have been taken as evidence.</p>
<p>For number of individuals per premises type p in the project boundary in year y, $HN_{p,y}$:</p> <p>B.7.1 of PDD:</p> <p>The source of this parameter is project survey. So, the monitoring method of this parameter is consistent with project survey.</p>	<p>For number of individuals per premises type p in the project boundary in year y, $HN_{p,y}$:</p> <p>A serial number was put on each of Multi-Layer water purifiers sold to the users. A list of all the users and the corresponding serial numbers of their Multi-Layer water purifiers was kept.</p>

⁸ As the requirement of approved methodology, the first round of testing shall be conducted at least after six months from the start date. The start date of the project is 09/10/2020, so the survey time 02/06/2021-11/06/2021 meet methodological requirements.

⁹ The monitoring team consist of 12 team members, each team member is responsible for 8-10 water samples.

¹⁰ https://www.kebs.org/index.php?option=com_content&view=article&id=94:microbiology-laboratory&catid=30&Itemid=161

<p>B7.2.1 of PDD:</p> <p>The safe water project survey is conducted with end user's representative of the project scenario target population and currently using the safe water project technology. The project survey will be carried out using representative and random sampling following the GS guidelines for minimum sample size:</p> <p>Group size <300: Minimum sample size 30 Group 300 to minimum to 1,000: Minimum sample size 10% of group size Group size >1,000: Minimum sample size 100</p> <p>The project survey will likely have a minimum sample size of 100 as the number of water purifier sold is estimated to be greater than 1,000.</p> <p>End users for the project survey will be selected using representative sampling techniques to ensure adequate representation of users with technologies of different ages. Common sampling approach such as clustered random sampling is allowed, and geographic distribution will be factored into selection criteria. End users can be surveyed at any time throughout the year with care taken to collect information pertaining to seasonal variations in technology and fuel use patterns.</p> <p>B.7.3.2 of PDD:</p> <p>The project survey provides critical information on year-to-year trends in end user characteristics such as technology use, fuel consumption and seasonal variations. Questionnaire which is similar to the baseline survey (Refer to Table B4.1 of PDD for sample questionnaire) will be adapted. It will be conducted with end-user's representative of the project scenario target population and currently using</p>	<p>The sold of Multi-Layer water purifiers started on 09/10/2020 and sales plan for the first year was completed within two months and completed on 30/11/2020. So, all water purifiers involved in this monitoring period have the same age.</p> <p>As the Project Survey and the WCFT can be conducted concurrently using the same sample, As the description of the sample size in PDD. For project survey, the minimum sample size is 100, for WCFT, the sample size is 101. So, the final sample size is 101, 101 samples were randomly selected from 467,123 water purifiers users using MS Excel software by the Survey Group at the beginning of 2021¹¹.</p> <p>The project survey was conducted by GS monitoring team, which consisted of sales group, survey group and record group. All the team members were properly trained on 15/10/2020 and 25/05/2021, so that they were fully aware of the monitoring procedures and the conservative principle.</p> <p>The monitoring team member conducted the in-person paper survey on 18/01/2021-28/01/2021. During the project survey, the monitoring team member ask the End-user to fill the questionnaire, the questionnaire which is similar to the baseline survey (Refer to Table B4.1 of PDD for sample questionnaire) was adapted. The critical information including end user basic characteristics, family size, technology use, fuel consumption and seasonal variations, etc.</p> <p>After the project survey, the questionnaires</p>
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¹¹ Since the monitoring period of this project covers only 3 months in 2020, and all the water purifiers put into operation on 01/12/2020. Also, this monitoring period is only 10 months, less than a year. In addition, the project survey can be conducted with WCFT together, the monitoring of WCFT lasts for 4 days and cannot be done on weekends and holidays. There are many holidays in December 2020, so it is not suitable for monitoring activities of WCFT. so, the 101 samples in 2021 can be representative the entire monitoring period.

<p>the safe water project technology. Related data and information will be collected through in-person paper surveys, which will be then entered into an excel file to be used to analyze the data.</p> <p>In the guidance on data collected, questions about end user characteristics and baseline technology and fuels should be treated as specific to safe water supply and boiling. These questions should be asked twice, first in regard to the baseline scenario water supply and water treatment, including boiling technologies, and second in regard to the project scenario clean water supply, including treatment and boiling technologies.</p> <p>The Project Survey and the WCFT can be conducted concurrently using the same sample.</p>	<p>were collected, and the results were summarized.</p> <p>Samples of project survey questionnaires, project survey summary table and photos can be taken as evidence.</p> <p>From project survey questionnaires, the average number of individuals per premises in this monitoring period is 3.94 (398/101) number.</p>
<p>For proportion of project households that boil safe (treated, or from safe supply) water after installation of project technology in year y, $X_{cleanboil,y}$:</p> <p>B.7.1 of PDD: The source of this parameter is project survey. So, the monitoring method of this parameter is consistent with project survey.</p> <p>B7.2.1 of PDD: The safe water project survey is conducted with end user's representative of the project scenario target population and currently using the safe water project technology. The project survey will be carried out using representative and random sampling following the GS guidelines for minimum sample size:</p> <p>Group size <300: Minimum sample size 30 Group 300 to minimum to 1,000: Minimum sample size 10% of group size Group size >1,000: Minimum sample size 100</p> <p>The project survey will likely have a minimum sample size of 100 as the number of water purifier sold is estimated to be greater than 1,000.</p>	<p>For proportion of project households that boil safe (treated, or from safe supply) water after installation of project technology in year y, $X_{cleanboil,y}$:</p> <p>A serial number was put on each of Multi-Layer water purifiers sold to the users. A list of all the users and the corresponding serial numbers of their Multi-Layer water purifiers was kept.</p> <p>The sold of Multi-Layer water purifiers started on 09/10/2020 and sales plan for the first year was completed within two months. So, all water purifiers involved in this monitoring period have the same age.</p> <p>As the Project Survey and the WCFT can be conducted concurrently using the same sample, As the description of the sample size in PDD. For project survey, the minimum sample size is 100, for WCFT, the sample size is 101. So, the final sample size is 101, 101 samples were randomly selected from 467,123 water purifiers users using MS Excel software by the Survey Group at</p>

<p>End users for the project survey will be selected using representative sampling techniques to ensure adequate representation of users with technologies of different ages. Common sampling approach such as clustered random sampling is allowed, and geographic distribution will be factored into selection criteria. End users can be surveyed at any time throughout the year with care taken to collect information pertaining to seasonal variations in technology and fuel use patterns.</p> <p>B.7.3.2 of PDD:</p> <p>The project survey provides critical information on year-to-year trends in end user characteristics such as technology use, fuel consumption and seasonal variations. Questionnaire which is similar to the baseline survey (Refer to Table B4.1 of PDD for sample questionnaire) will be adapted. It will be conducted with end-user's representative of the project scenario target population and currently using the safe water project technology. Related data and information will be collected through in-person paper surveys, which will be then entered into an excel file to be used to analyze the data.</p> <p>In the guidance on data collected, questions about end user characteristics and baseline technology and fuels should be treated as specific to safe water supply and boiling. These questions should be asked twice, first in regard to the baseline scenario water supply and water treatment, including boiling technologies, and second in regard to the project scenario clean water supply, including treatment and boiling technologies.</p> <p>The Project Survey and the WCFT can be conducted concurrently using the same sample.</p>	<p>the beginning of 2021¹².</p> <p>The project survey was conducted by GS monitoring team, which consisted of sales group, survey group and record group. All the team members were properly trained on 15/10/2020 and 25/05/2021, so that they were fully aware of the monitoring procedures and the conservative principle.</p> <p>The monitoring team member conducted the in-person paper survey on 18/01/2021-28/01/2021. During the project survey, the monitoring team member ask the End-user to fill the questionnaire, the questionnaire which is similar to the baseline survey (Refer to Table B4.1 of PDD for sample questionnaire) was adapted. The critical information including end user basic characteristics, family size, technology use, fuel consumption, do you boil safe water and seasonal variations, etc.</p> <p>After the project survey, the questionnaires were collected, and the results were summarized.</p> <p>Samples of project survey questionnaires, project survey summary table and photos have been taken as evidence.</p> <p>From project survey questionnaires, the proportion of project households that boil safe (treated, or from safe supply) water after installation of project technology in this monitoring period is 0.</p>
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¹² Since the monitoring period of this project covers only 3 months in 2020, and all the water purifiers put into operation on 01/12/2020. Also, this monitoring period is only 10 months, less than a year. In addition, the project survey can be conducted with WCFT together, the monitoring of WCFT lasts for 4 days and cannot be done on weekends and holidays. There are many holidays in December 2020, so it is not suitable for monitoring activities of WCFT. so, the 101 samples in 2021 can be representative the entire monitoring period.

<p>Volume of drinking water per person per day for premises type p, QPW_p:</p> <p>B.7.2.2 of PDD: For WCFT statistical analysis, 90/10 precision level will be selected. The survey will be a single sample for establishing project scenario water consumption. The calculation of the sample size for the survey shall be based upon a 0.6 Coefficient of Variation (COV) under a 90/10 approach as provided in Table 3 of Annex 4 of TPDDTEC (Version 3.1).</p> <p>B.7.3.3 of PDD The water consumption field test (WCFT) measures project-supplied clean water consumption volumes. The WCFT is conducted with end user's representative of the project scenario target population and currently using the project technology. The WCFT must be designed to ensure that monitoring is representative of typical technology use practices and that:</p> <ul style="list-style-type: none"> - it is transparent and can easily be replicated, - it is evidently conservative, - the sample is randomly selected so as to not introduce a material bias, and - the impact of daily and seasonal variations on the expected average water consumption is accounted for. <p>The WCFT must be conducted over 3 days, not including weekends, and averaged value (L/person/day) value should be determined after excluding outliers. It must be made explicit to the households/institutions that they must behave and consume water normally, reflecting typical daily water consumption pattern. WCFT protocol are designed for the project based on the Kitchen Project Test (KPT) guidelines in Annex 4 of TPDDTEC (Version 3.1). The</p>	<p>Volume of drinking water per person per day for premises type p, QPW_p:</p> <p>A serial number was put on each of Multi-Layer water purifiers sold to the users. A list of all the users and the corresponding serial numbers of their Multi-Layer water purifiers was kept.</p> <p>The sold of Multi-Layer water purifiers started on 09/10/2020 and sales plan for the first year was completed within two months. So, all water purifiers involved in this monitoring period have the same age.</p> <p>As the Project Survey and the WCFT can be conducted concurrently using the same sample, As the description of the sample size in PDD. For project survey, the minimum sample size is 100, for WCFT, the sample size is 101. So, the final sample size is 101, 101 samples were randomly selected from 467,123 water purifiers users using MS Excel software by the Survey Group at the beginning of 2021¹³.</p> <p>The WCFT was conducted by GS monitoring team, which consisted of sales group, survey group and record group. All the team members were properly trained on 15/10/2020 and 25/05/2021, so that they were fully aware of the monitoring procedures and the conservative principle. The monitoring team consists of 12 people, each of whom is responsible for the monitoring of 8-10 samples. The monitoring activity lasted 4 days and was completed in two weeks. Each monitoring member was responsible for 4-5 households every week. The monitoring activity of this parameter was</p>
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¹³ Since the monitoring period of this project covers only 3 months in 2020, and all the water purifiers put into operation on 01/12/2020. Also, this monitoring period is only 10 months, less than a year. As applied methodology, the monitoring of WCFT lasts for 4 days and cannot be done on weekends and holidays. There are many holidays in December 2020, so it is not suitable for monitoring activities of WCFT. So, the 101 samples in 2021 can be representative the entire monitoring period.

<p>protocol will be executed over a four-day period with the first day targeted at questionnaires and surveys with the remaining three left dedicated to WCFT exercises. The four-day period shall not be carried out over a holiday period to ensure conservative quantification of water consumption per end user.</p> <p>Day 0: Training of field enumerators</p> <p>The PP will carry out training exercise with the enumerators who would then proceed to carry out the WCFT. The PP will go over the survey questions to be asked during WCFT exercise as well as did mock examples of real WCFT with the enumerators to ensure they understood what would take place in a real-world situation in the field. Calibrated buckets are issued to each of the enumerators which they would use in the field in measuring the water volume consumed in a day per household. Enumerators are expressly told to ensure maximum accuracy in measuring water using the buckets.</p> <p>Day 1: Surveys and Introduction</p> <p>The project proponent will inform the end-users of the 3-day WCFT exercise that them that they should treat water as usual. Households will report on the times at which they treat water every day. The times reported shall be recorded to allow enumerators to go to the end-user's residence the following day before raw water is treated. Distribute calibration flasks for measurement to users.</p> <p>Day 2 – 4: WCFT exercise</p> <p>Distribute a Water consumption survey record form to users every morning before the user's beginning to use water. When users want to use water, use a volumetric flask to collect water from the water purifier and record the amount of water received. Daily Water consumption by the end users will be measured in these flasks filtered through the water filter. In every evening the Water consumption survey record form will be collected.</p> <p>The mean value of the total water consumption (the</p>	<p>completed successively on 18/01/2021 to 21/01/2021 and 25/01/2021 to 28/01/2021, which is not the weekends and holidays.</p> <p>The specific monitoring process are:</p> <p>Day 0: Training of field enumerators</p> <p>PP organized a training for the monitoring staff. The training mainly included the problems to be investigated and simulation of real WCFT. In addition, the measurement tools (standard volumetric flasks) were distributed to Monitoring staff and explain and train the measurement methods and accuracy to ensure that the monitoring activity can be carried out in an orderly manner. The standard volumetric flasks (Range: 1.5L) were used to measure the water consume volume every day.</p> <p>Day 1: Surveys and Introduction</p> <p>As the Project Survey and the WCFT can be conducted concurrently using the same sample, the monitoring staff conducted the project survey on the sample users on this day. In addition, the monitoring staff investigated the user's daily water consumption time and whether the water consumption level for the next 3 days represented the usual water consumption level and notified the sample users to conduct a water consumption survey for the next 3 days and distribute standard volumetric flasks to the users.</p> <p>Day2-4: WCFT exercise</p> <p>According to the start time and end time of the sample user's water use recorded on Day 1. In every morning of Day 2-4, The staff came to distribute a Water consumption survey record form to users before the user's beginning to use</p>
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<p>total water consumption per day aggregated over a three-day period) will establish the value QPW_p per end user. Which will then be aggregated (after elimination of outliers) to determine the value used to calculate Emission Reductions for the whole project per technology.</p> <p>The end user will then be asked if at all they boil any of the clean water or if they consume any raw water without boiling.</p> <p>Water consumption for the water filter will be capped at 5.5 litres per person per day in accordance with the applied GS methodology.</p>	<p>water ¹⁴ and in the evening¹⁵ the staff came to collect the Water consumption survey record form after the day's water consumption was over.</p> <p>When users want to use water, use a volumetric flask to collect water from the water purifier and record the amount of water received in Water consumption survey record form. After the three-day activity have finished, the monitoring staff took back the calibration bucket.</p> <p>Sum each water consumption record can get the daily water consumption.</p> <p>The mean value of the total water consumption (the total water consumption per day aggregated over a three-day period) have been establish the value QPW_p per end user.</p> <p>Samples of water consumption survey record form of WCFT and water consumption survey summary table have been taken as evidence.</p>
<p>For usage rate of the project technology by premises type p during year y, $U_{p,y}$:</p> <p>As B.7.3.4 of PDD, the monitoring of the parameter is according to Annex 1 of applied methodology. The guidelines outline six topics which must be successfully completed for the survey respondent to be classed as a user. Additionally, other topics relevant to specific technology types and project conditions are required to provide accurate estimates of the usage of the water purifiers. If all six topics outlined are successfully completed the survey respondent can be classed as a user. If failure occurs</p>	<p>For usage rate of the project technology by premises type p during year y, $U_{p,y}$:</p> <p>A serial number was put on each of Multi-Layer water purifiers sold to the users. A list of all the users and the corresponding serial numbers of their Multi-Layer water purifiers was kept.</p> <p>The sold of Multi-Layer water purifiers started on 09/10/2020 and sales plan for the first year was completed within two months and completed on 30/11/2020. So, all water purifiers involved in this monitoring period have the same age. As</p>

¹⁴ Before the sample user starts to use water. During the monitoring activities on Day 1, the monitoring staff informed the users that it is best not to use water before they come to the door for measurement records. In order not to affect the normal life of the sample users, the monitoring staff carried out the measurement 1-0.5 hours before starting to use water.

¹⁵ After the sample user no longer uses water. During the evening survey, the monitoring staff asked the sample user whether the day's water consumption was over. After the sample user confirmed that the water use was over, the monitoring staff carried out measurement activities.

<p>in one or more of the topics, then the respondent is classed as a non-user. The project proponent needs to clearly define what is deemed a success or a failure for each topic area as part of its usage plan.</p> <p>It is required that sufficient precautions are taken by enumerators to ensure that there is no bias while conducting the usage surveys. For example:</p> <ul style="list-style-type: none"> - The survey should not be conducted immediately after capacity building/awareness programs in the target households. - Surveyors should not wear clothes with logos of their employers, etc. <p>B.7.2.3 of PDD:</p> <p>The minimum total sample size for Usage Survey is 100, with at least 30 samples for project technologies of each age being credited. The majority of interviews in a usage survey must be conducted in person. Thus, if technologies of age 1-5 are credited, the usage survey must include 30 representative samples from each age for total of 150 samples. The resulting usage parameter should be weighted based on the proportion of technologies in the borehole database of each age.</p> <p>In line with the applied GS methodology, any sampling methods can be used, provided that the sample is selected randomly. If sampling approach other than simple random sampling is applied, CDM Guideline: Sampling and surveys for CDM project activities and programmes of activities (Version 04.0) must be followed.</p>	<p>the description of the sample size in PDD, the sample size for usage rate survey is 100. 100 samples were randomly selected from 467,123 water purifiers users using MS Excel software at the beginning of 2021¹⁶.</p> <p>The Usage rate survey was conducted by GS monitoring team, which consisted of sales group, survey group and record group. All the team members were properly trained on 15/10/2020 and 25/05/2021, so that they were fully aware of the monitoring procedures and the conservative principle. The monitoring activity of this parameter was completed successively on 01/02/2021¹⁷.</p> <p>According to Annex 1 of applied methodology. The guidelines outline six topics which must be successfully completed for the survey respondent to be classed as a user. Additionally, other topics relevant to specific technology types and project conditions are required to provide accurate estimates of the usage of the water purifiers.</p> <p>During the usage rate survey, End users were invited to fill out the questionnaire. The questionnaire contains the following six topics according to Annex 1 of applied methodology:</p> <p>Topic 1: Introductory question and water treatment.</p> <p>Q1: Are you the main user /operator of the water purifier in the household?</p> <p>Q2: Did you do anything to make your water safer to drink?</p> <p>Q3: How did you make this water safer to drink?</p>
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¹⁶ Since the monitoring period of this project covers only 3 months in 2020, and all the water purifiers put into operation on 01/12/2020. This monitoring period is only 10 months, less than a year, so the 101 samples in 2021 can be representative the entire monitoring period.

¹⁷ The monitoring team consists of 12 people, each of whom is responsible for the monitoring of 8-10 samples.

	<p>The first question can confirm that all respondents were the main user /operator of the water purifier in their households.</p> <p>Topic 2: Rate of usage.</p> <p>Q1: How often do you filter water?</p> <p>Q2: When was the last time you filtered water using the project water purifier?</p> <p>Q3: Have you used the project water purifier in the last two days?</p> <p>As description in PDD, the households that show at least once-in-two-days use may be counted as users.</p> <p>Topic 3: Water storage</p> <p>Q1. Is there a safe storage container that contains filtered water in it?</p> <p>Q2: If 'no', when was the last time there was filtered water in it?</p> <p>Topic 4: Physical signs of usage</p> <p>Q1: Observe to see if the project water purifier shows signs of usage?</p> <p>Topic 5: Demonstration & knowledge</p> <p>Q1: Can you please show us how you filter water?</p> <p>Q2: Can you please give us a cup of drinking water?</p> <p>Topic 6: Functionality</p> <p>Q1: Observe whether the HWT unit is currently functional.</p> <p>After the Usage rate survey, the questionnaires were collected, and the results were summarized.</p> <p>Samples of Usage survey questionnaires, Usage survey summary table and photos have been taken as evidence.</p> <p>From the completion of six topics questionnaires</p>
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	and the survey of Topic 2, the usage rate of the water purifier in this monitoring period is 89% (89/100*100%).
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Due to the non-industrial nature of the project, emergency procedures are not applicable to the project. For QA/QC procedure, please refer to QA/QC procedures in section D.2.

Avoiding Double Counting

The Avoiding Double Counting of this project is detailed below:

The project owner is the overall data management department and all the data collected should be submitted to the project owner for the purpose of effective management. To avoiding double counting, the following measures will be taken:

(i) In order to cover more households with high-quality water purifiers at a lower price, it is restricted in the project that each household can only buy one set of water purifier. After the project put into operation, the project owner will arrange for relevant personnel to conduct irregular surveys on the use of the water purifier, the survey member inform the End-user that if the water purifier is damaged or parts need to be replaced, the project owner can be notified in time, and the project owner will repair and replace parts free of charge in time to ensure the water purifier in normal use. Also, each water purifier sold has a unique number with a unique naming rule¹⁸. If the project owner uses other types of water purifiers that are not within the project boundary, these water purifiers will not have a unique serial number that complies with this naming rule and will not be included in the calculation of emission reductions.

Therefore, only one water purifier per household is considered in the emission reduction calculation and only calculated once.

(ii) Declaration of No Double Counting by the project owner was signed by project owner.

SECTION D. DATA AND PARAMETERS

D.1. Data and parameters fixed ex ante or at renewal of crediting period

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Related to water quality

¹⁸ The name of water purifier consists of project name (KWFP), sales region (K, N, M, T, B) and sales serial number, such as KWFP-B-1 means the first water purifier sold in Bungoma county of this project.

Parameter ID	SDWS 2
Data/parameter	<i>Project technology description</i>
Unit	N/A
Description	<p>The Multi-Layer water purifiers are produced by Zhejiang Duanqi Renewable Energy Co., Ltd., which consist of 8 step filtration system and can purify water 3 liter/hour. The lifespan of the water purifiers are over 15 years and the dome ceramic, carbon cartridge and mineral stone should be changed when purify every 10,000 L water. The project equipment provides safe drinking water that are free from pathogens and elevated levels of toxic substances.</p> <p>In addition, the water purifier involved in this project obtain the pre-export verification of conformity by KEBS (Kenya bureau of standards). Moreover, according to the water quality test report by the KEBS, the purified water quality of the product meets the standards of KS EAS 153: 2018 East African Standard Specification for Packaged Drinking Water.</p>
Source of data	Manufacturer specifications and the pre-export verification of conformity.
Value(s) applied	N/A
Choice of data or Measurement methods and procedures	<p>The manufacturer specifications, the pre-export verification of conformity and the water quality test report provide an accurate evidence of compliance with relevant standards. It also can be known from the sales contract that the water purifier is also presented with a filter element as a spare when it is sold. When the water purifier has been used for less than 22 months, when the user needs to replace the filter element, a request can be sent to the project owner, and the user can use a spare filter element during the time period when the project owner comes to replace it. Of course, after receiving the request, the project owner will immediately go to the user's home to replace the core filter. When the water purifier has been used for 22 months, the project owner will replace the alternative materials of all the water purifier sold.</p>
Purpose of data	The Project technology of the water purifier involved in this project meet the relevant standard and the product is eligible products.
Additional comment	N/A

Parameter ID	<i>SDWS 4</i>
Data/parameter	<i>Regulatory framework for safe water supply</i>
Unit	N/A
Description	Water scarcity in various regions of Kenya has been an issue for decades. The government has issued some water resources related policies and regulations. The <i>Water Act 2016</i> provides for the regulation, management and development of water resources and water and sewerage services in line with the Constitution. The <i>National Water Quality Management Strategy (NWQMS)</i> issued by the Ministry of Water and Irrigation to improve water quality. The <i>Kenya National Water Master Plan 2030</i> developed by Ministry of Environment, Water and Natural Resources recognizes water as an enabler in socio-economic development and aims to improve water and sanitation availability and access to all by 2030. The implementation of the project is fully in line with the relevant water resources policies of Kenya.
Source of data	National authorities
Value(s) applied	N/A
Choice of data or Measurement methods and procedures	National authorities provide the powerful regulatory framework for safe water supply
Purpose of data	The Kenyan government attaches great importance to the issue of water resources. This project could bring water benefits to the Kenyan people. So, the implementation of the project is fully in line with the relevant water resources policies of Kenya.
Additional comment	N/A

Parameter ID	<i>SDWS 5</i>
Data/parameter	<i>Water sources in the project boundary</i>
Unit	N/A
Description	The water source in the project boundary and whether they are used for drinking water, and for all that are used for drinking water, classify them as improved and unimproved water source.
Source of data	Baseline study conducted from 10/10/2020 to 20/12/2020.

Value(s) applied	0.59% (3HH/505HH) of the households are available of piped water. 6.7% (34HH/505HH) of the households take water from boreholes or protected wells. As per Annex 2 of the applied GS methodology, piped water and water from boreholes or protected wells belong to improved sources of drinking water. For the rest of 92.7% (468HH/505HH) households, the most common sources of water are from unprotected well, unprotected spring and surface water, which belong to unimproved sources of drinking water.
Choice of data or Measurement methods and procedures	The baseline study conducted from 10/10/2020 to 20/12/2020 provided the water source in project boundary.
Purpose of data	From the baseline survey, the most people in Kenya can't obtained the safety water from improved water source, so the implementation of this project is important for the safety of drinking water for Kenyans. Demonstrated the reasonableness of project implementation.
Additional comment	N/A

SDG13

Parameter ID	<i>SDWS 6</i>
Data/parameter	<i>Stove technologies used in the project boundary</i>
Unit	N/A
Description	The proportion of different stove types used in premises in the geographical area of the project.
Source of data	Baseline survey conducted from 10/10/2020 to 20/12/2020.
Value(s) applied	The stove used to boil water in baseline scenario is three-stone stoves (67.2%, 223HH/332HH), Conventional stoves (19.3%, 64HH/332HH), improved stoves (6.3%, 21HH/332HH) and LPG stoves (7.2%, 24HH/332HH). The project is implemented in Makueni, Trans Nzoia, Kirinyaga, Bungoma and Nakuru Counties of Kenya, the proportion of different stove types are defined for each county. Refer to section B.4.1 of the PDD for more details.
Choice of data or Measurement methods and procedures	The baseline study conducted from 10/10/2020 to 20/12/2020 provided the proportion of different stove types used in premises in the geographical area of the project.
Purpose of data	To calculate the baseline emissions.

Additional comment	N/A
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Parameter ID	SDWS 7
Data/parameter	Expected technical life of project technology
Unit	Operational lifespan of the water purifiers are more than 15 years
Description	As per manufacturer specifications of the water purifiers, the dome ceramic should be cleaned every 7 days with toothbrush, the outside of carbon cartridge should be cleaned every 10 days and the dome ceramic, carbon cartridge and mineral stone should be changed when purify every 10,000 L water (about 22 months).
Source of data	Manufacturer specifications
Value(s) applied	More than 15 years
Choice of data or Measurement methods and procedures	The manufacturer specifications provided the accuracy information of expected technical life of an individual project technology and the details include both technology/device life and filter life. Consider conservatively, it is believed that the water purifier Involved in this project began to use on 10/10/2020. In this monitoring, the using time is less than one year. As per the technical manual of the water purifier, the frequency of replacement is every 10,000 L water (about 22 months), so in this monitoring period, there is no core filter replacement happened.
Purpose of data	The expected technical life of project technology meets the total length of crediting period.
Additional comment	N/A

Parameter ID	SDWS 8			
Data/parameter	$X_{firewood}/X_{charcoal}/X_{LPG}$			
Unit	Percentage of firewood, charcoal and LPG			
Description	The proportion of each different household cooking fuel (firewood, charcoal and LPG) used in the project boundary			
Source of data	Baseline survey conducted from 10/10/2020-20/12/2020.			
Value(s) applied	County	$X_{firewood}$	$X_{charcoal}$	X_{LPG}
	Makueni	81.3	18.8	0
	Trans Nzoia	78.3	19.6	2.2
	Kirinyaga	93.1	6.9	0

	<table><tr><td>Bungoma</td><td>79.7</td><td>17.4</td><td>2.9</td></tr><tr><td>Nakuru</td><td>56.7</td><td>21.6</td><td>21.6</td></tr><tr><td>Total</td><td>75.9</td><td>16.9</td><td>7.2</td></tr></table>	Bungoma	79.7	17.4	2.9	Nakuru	56.7	21.6	21.6	Total	75.9	16.9	7.2
Bungoma	79.7	17.4	2.9										
Nakuru	56.7	21.6	21.6										
Total	75.9	16.9	7.2										
Choice of data or Measurement methods and procedures	505 households participated the baseline survey (101 households for each County). 332 households (Makueni 48, Trans Nzoia 46, Kirinyaga 72, Bungoma 69 and Nakuru 97) treat unsafe drinking water by boiling. The questionnaire shown in Table B4.1 of PDD are adapted to capture the information of fuel types and stove types used to boil water. The data was collected through paper surveys, which were then entered into an excel file to be used to analyze the data. Refer to section B4.1 of PDD for more details.												
Purpose of data	To demonstrate contribution to SDG 13.												
Additional comment	The proportion of different fuel types are defined for each County. According to applied methodology, the percentages applied shall be cross-checked against at least one other source on the list. For cross-check purposes, sources applied may be up to 5 years old. In this project the cross-check document is <i>Water Survey Report</i> approved by National Environment Management Authority , which belongs to credible published literature for project region. According to <i>Water Survey Report</i> approved by National Environment Management Authority, in Turkana, Makueni, Kirinyaga, Mandera, Tran Nzoia, Bungoma and Nakuru County, the main fuel used for boiling water were firewood and products of wood 77.1%, charcoal 17.1% and LPG 5.8%. So, consider conservative principles, the percentage of firewood, charcoal and LPG is 75.9%, 16.9% and 7.2% in the calculation of baseline emissions.												

Parameter ID	SDWS 9
Data/parameter	$EF_{b, firewood, CO_2}$
Unit	tCO ₂ /TJ
Description	CO ₂ emissions factor of the fuel (firewood) that it substituted or reduced
Source of data	IPCC 2006 default value (Table 1.4 of Chapter 1 Introduction)
Value(s) applied	112

Choice of data or Measurement methods and procedures	IPCC default values provide an accurate and conservative estimate of emissions reduction from various fuel sources.
Purpose of data	To demonstrate contribution to SDG 13.
Additional comment	N/A

Parameter ID	<i>SDWS 9</i>
Data/parameter	<i>EF_{b, charcoal, CO2}</i>
Unit	tCO ₂ /TJ
Description	CO ₂ emissions factor of the fuel (charcoal) that it substituted or reduced
Source of data	<i>Methodology for Emission reductions from safe drinking water supply (Version 1.0)</i>
Value(s) applied	165.22 (includes charcoal production emissions)
Choice of data or Measurement methods and procedures	IPCC default values provide an accurate and conservative estimate of emissions reduction from various fuel sources.
Purpose of data	To demonstrate contribution to SDG 13.
Additional comment	N/A

Parameter ID	<i>SDWS 9</i>
Data/parameter	<i>EF_{b, LPG, CO2}</i>
Unit	tCO ₂ /TJ
Description	CO ₂ emissions factor of the fuel (LPG) that it substituted or reduced
Source of data	IPCC 2006 default value (Table 1.4 of Chapter 1 Introduction)
Value(s) applied	63.1
Choice of data or Measurement methods and procedures	IPCC default values provide an accurate and conservative estimate of emissions reduction from various fuel sources.
Purpose of data	To demonstrate contribution to SDG 13.
Additional comment	N/A

Parameter ID	<i>SDWS 10</i>
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Data/parameter	$EF_{b, \text{firewood}, \text{nonCO2}}$
Unit	t/TJ
Description	Non CO ₂ emissions factor of the firewood that is substituted or reduced
Source of data	Table 2.5 of Chapter 2 Stationary Combustion (IPCC 2006) and Table 8.7 of 2013 Climate Change 2013 The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).
Value(s) applied	9.46 (0.3t/TJ*28+ 0.004t/TJ*265)
Choice of data or Measurement methods and procedures	Determined as per IPCC default figures.
Purpose of data	To demonstrate contribution to SDG 13.
Additional comment	N/A

Parameter ID	<i>SDWS 10</i>
Data/parameter	$EF_{b, \text{charcoal}, \text{nonCO2}}$
Unit	t/TJ
Description	Non CO ₂ emissions factor of the firewood that is substituted or reduced
Source of data	<i>Methodology for Emission reductions from safe drinking water supply (Version 1.0)</i>
Value(s) applied	44.83 (includes production emissions of CH ₄ and N ₂ O)
Choice of data or Measurement methods and procedures	Determined as per IPCC default figures.
Purpose of data	To demonstrate contribution to SDG 13.
Additional comment	N/A

Parameter ID	<i>SDWS 10</i>
Data/parameter	$EF_{b, \text{LPG}, \text{nonCO2}}$
Unit	t/TJ
Description	Non CO ₂ emissions factor of the LPG that is substituted or reduced

Source of data	Table 2.5 of Chapter 2 Stationary Combustion (IPCC 2006) and Table 8.7 of 2013 Climate Change 2013 The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).
Value(s) applied	0.1665 (0.005t/TJ*28+ 0.0001t/TJ*265)
Choice of data or Measurement methods and procedures	Determined as per IPCC default figures.
Purpose of data	To demonstrate contribution to SDG 13.
Additional comment	N/A

Parameter ID	SDWS 11													
Data/parameter	η_{wb}													
Unit	%													
Description	Weighted average efficiency of the baseline water boiling. Calculate the weighted average of the water boiling efficiency in the project boundary using the proportion of different stove types used and the stove efficiencies.													
Source of data	Baseline Survey conducted from 10/10/2020-20/12/2020.													
Value(s) applied	<table><tr><td>County</td><td>η_{wb}</td></tr><tr><td>Makueni</td><td>12.9</td></tr><tr><td>Trans Nzoia</td><td>14.8</td></tr><tr><td>Kirinyaga</td><td>11.3</td></tr><tr><td>Bungoma</td><td>14.6</td></tr><tr><td>Nakuru</td><td>22.9</td></tr></table>		County	η_{wb}	Makueni	12.9	Trans Nzoia	14.8	Kirinyaga	11.3	Bungoma	14.6	Nakuru	22.9
County	η_{wb}													
Makueni	12.9													
Trans Nzoia	14.8													
Kirinyaga	11.3													
Bungoma	14.6													
Nakuru	22.9													
Choice of data or Measurement methods and procedures	<p>505 households participated the baseline survey (101 households for each County). 332 households (Makueni 48, Trans Nzoia 46, Kirinyaga 32, Bungoma 69 and Nakuru 137) treat unsafe drinking water by boiling. The questionnaire shown in Table B4.1 of PDD are adapted to capture the information of fuel types and stove types used to boil water. The data was collected through paper surveys, which were then entered into an excel file to be used to analyze the data. Refer to section B4.1 of this PDD for more details.</p> <p>Default efficiency values for different type of stoves: three-stone stoves 10%, conventional stoves 20%, improved stoves 30%. As</p>													

	per manufacturer specifications of the baseline LPG stoves, the highest efficiency is 50%.
Purpose of data	To demonstrate contribution to SDG 13.
Additional comment	N/A

Parameter ID	SDWS 12
Data/parameter	C_b
Unit	%
Description	Proportion of project households who in the baseline were already using a safe water supply that did not require boiling.
Source of data	Baseline Survey conducted from 10/10/2020-20/12/2020.
Value(s) applied	20.0
Choice of data or Measurement methods and procedures	The percentage of households who are available of safe drinking water before project activity is 7.3% (37HH/505HH). 78.4% (396HH/505HH) treat unsafe water before drinking and 14.3% (72HH/505HH) drink unsafe water directly without any treatment. Data and information collected from the questionnaires show that all the households surveyed are involved in water treatment for domestic consumption. Among those who treat water, 83.8% (332HH/396HH) of them boil water before drinking and 16.2% (64HH/396HH) use gravity household water filters, ultraviolet radiation treatment, reverse osmosis, chlorine tablets and other technologies. Therefore, C_b can be calculated as $7.3\% + 78.4\% \times 16.2\% = 20.0\%$.
Purpose of data	To demonstrate contribution to SDG 13.
Additional comment	According to applied methodology, the percentages applied shall be cross-checked against at least one other source on the list. For cross-check purposes, sources applied may be up to 5 years old. In this project the cross-check document is <i>Water Survey Report</i> approved by National Environment Management Authority, which belongs to Credible published literature for project region. According to <i>Water Survey Report</i> approved by National Environment Management Authority, in Turkana, Makueni, Kirinyaga, Mandera, Tran Nzoia, Bungoma and Nakuru County, 0.43% (2HH/462HH) of the households were available of piped water or bottled water. 5.8% (27HH/462HH) of the households got

	<p>water from boreholes or protected wells. Piped water, bottled water and water from boreholes or protected wells were improved sources for drinking (6.3%, 29HH/462HH). Among those who were not available of safe water (93.7%, 433HH/462HH), 12.9% (56HH/433HH) will treat unsafe water before drinking by chlorine tablets, water filters or similar technologies, 75.5% (327HH/433HH) will drink boiled water and the rest of them (18.2%, 79HH/433HH) will drink unsafe water directly. Therefore, the proportion of households who were already using a safe water supply that did not require boiling it can be calculated as $6.3\% + 12.9\% \times 93.7\% = 18.4\%$, which is less than 20.0%.</p>
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Parameter ID	SDWS 13
Data/parameter	q_i
Unit	Liters per hour
Description	Capacity of the household water treatment technology
Source of data	Manufacturer specifications
Value(s) applied	3
Choice of data or Measurement methods and procedures	Manufacturer specifications provides the capacity, lifetime and water quality of the household water treatment technology.
Purpose of data	To demonstrate contribution to SDG 13.
Additional comment	N/A

Parameter ID	SDWS 21
Data/parameter	$f_{NRB,f,y}$
Unit	%
Description	Fractional non-renewability status of woody biomass fuel during year y , in case the baseline fuel is biomass or charcoal
Source of data	Determined by CDM Tool 30 Calculation of the fraction of non-renewable biomass (Version 03.0)
Value(s) applied	66.4

Choice of data or Measurement methods and procedures	<p>Since it is difficult to estimate the locations and extent of areas from which woody biomass fuel used by the project is collected, the project proponent aggregates all reachable woody biomass fuel collection areas within Kenya and apply a single fraction derived from all collection areas in the country. According to <i>East African Civil Society for Sustainable Energy and Climate Action</i> (EASE & CA) published on August 2020¹⁹, biomass fuels consumption in Kenya in 2017 was 724 PJ²⁰, in which sustainable potential of solid biomass was 243 PJ. Therefore, <i>RB</i> is 243 PJ, <i>NRB</i> equals to 724-243=481 PJ.</p> $f_{NRB}=481/(481+243)=66.4\%$ <p>The f_{NRB} of 66.4% is fixed based on the results of the <i>NRB</i> assessment for the first crediting period.</p>
Purpose of data	To demonstrate contribution to SDG 13.
Additional comment	N/A

D.2. Data and parameters monitored

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Related to water quality

Parameter ID	SDWS 20
Data / Parameter	Water hygiene education campaigns
Unit	N/A
Description	Hygiene campaigns carried out among project technology users. The drinking water and hygiene practices will be assessed using the WHO/UNICEF Joint Monitoring Programme guidelines ²¹ (JMP 2018). In-person or telephone or by messaging based survey will be conducted including all the JMP core questions for drinking water and core questions for hygiene. Refer to section B.7.3 of the PDD for more details.
Source of data	Hygiene practices assessment
Value(s) applied	In this monitoring period, the fraction of the households where safe water are found to fulfill "safely managed" is 100%,i.e., All the project users have access to safe water because they have water purifiers.

¹⁹ https://www.inforse.org/africa/pdfs/Pub_100-Renewable-Energy-Plan-for-Kenya-by-2050-12-08-2020.pdf

²⁰ 1PJ=10¹⁵J.

²¹ <https://washdata.org/report/jmp-2018-core-questions-household-surveys>

	The fraction of the households where Hygiene practices are found to fulfill basic requirements is 7.92%, i.e., Among the 101 sample users surveyed, 8 users can get soap when washing their hands at home.
Measurement methods and procedures	<p>According to section 7.2 sample plan in PDD, 101 samples is sufficient to represent the entire population of 467,123 and the 101 samples were randomly selected from 467,123 water purifiers users using MS Excel software by the Survey Group at the beginning of 2021. So, there are 101 samples in this monitoring period for monitoring this parameter.</p> <p>The hygiene education campaigns have been conducted together on 02/06/2021-11/06/2021 during the monitoring team member visiting to end-user' homes and the monitoring team member conducted in-person survey including all the JMP core questions for drinking water and core questions for hygiene and ask them to fill the questionnaires.</p>
Monitoring frequency	Annually
QA/QC procedures	The fraction of the households where Safe water and Hygiene practices are found to fulfill "safely managed" or "basic" requirements is expected to increase over time as a result of the hygiene campaigns.
Purpose of data	
Additional comment	N/A

SDG 7

Parameter ID	SDWS 19																										
Data / Parameter	Number of water purifiers sold in year y																										
Unit	Sets																										
Description	Number of water purifiers sold in year y																										
Source of data	Sales database																										
Value(s) applied	According to the sales database in this monitoring period, the number of water purifiers sold in this monitoring period are shown as the following table.																										
	<table><tr><th rowspan="2">Year</th><th colspan="6">The number of water purifiers sold in year y (sets)</th></tr><tr><th>Makueni</th><th>Trans Nzoia</th><th>Kirinyaga</th><th>Bungoma</th><th>Nakuru</th><th>Total</th></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>							Year	The number of water purifiers sold in year y (sets)						Makueni	Trans Nzoia	Kirinyaga	Bungoma	Nakuru	Total							
Year	The number of water purifiers sold in year y (sets)																										
	Makueni	Trans Nzoia	Kirinyaga	Bungoma	Nakuru	Total																					

	09/10/2020-31/10/2020	39,176	37,965	32,398	44,426	61,272	215,237
	01/11/2020-30/11/2020	45,162	41,737	35,218	47,576	82,193	251,886
	01/12/2020-31/12/2020	0	0	0	0	0	0
	01/01/2021-31/01/2021	0	0	0	0	0	0
	01/02/2021-28/02/2021	0	0	0	0	0	0
	01/03/2021-31/03/2021	0	0	0	0	0	0
	01/04/2021-30/04/2021	0	0	0	0	0	0
	01/05/2021-31/05/2021	0	0	0	0	0	0
	01/06/2021-30/06/2021	0	0	0	0	0	0
	01/07/2021-31/07/2021	0	0	0	0	0	0
	Total	84,338	79,702	67,616	92,002	143,465	467,123
Measurement methods and procedures	The water purifiers involved in the project are sold at the sales point in each region. For each water purifier sold, the sales personnel signed a sales contract with the buyer and filled the buyer's name, gender, water purifier number, sales time, sold region and other information in the sales record system. GS monitoring team exported the sales information in the system and summarized the sales record table into excel.						
Monitoring frequency	Yearly						
QA/QC procedures	The number of water purifiers sold was based on the sale database and cross checked by the purchase receipt.						
Purpose of data	To demonstrate contribution to SDG 7.						
Additional comment	N/A						

SDG 6/SDG 13

Parameter ID	SDWS 18
Data / Parameter	$M_{q,y}$
Unit	%
Description	Ongoing water quality indicated as the fraction of the samples that pass microbial quality standard requirements specified in relevant microbial quality standard for drinking water of the host country

	(KS EAS 153: 2018 East African Standard Specification for Packaged Drinking Water).												
Source of data	Testing of the water that exits the treatment technology.												
Value(s) applied	100%. From the summary table of WQT, the quality of all the filtered water samples meets the standards of "KS EAS 153: 2018 East African Standard Specification for Packaged Drinking Water", so the modifier for the water quality used to calculate emission reductions in this monitoring period is 100%.												
Measurement methods and procedures	<p>The water quality test applied the bacterial quality standard <1 cfu/100ml, and the sampling determines the proportion of pass and fail results. The sample size is following 90/10 precision rule and a minimum sample size of 30 must be selected. The calculation of the sample size for the test was based upon a 0.6 Coefficient of Variation (COV) under a 90/10 approach as provided in Table 3 of Annex 4 of TPDDTEC (Version 3.1). So, the sample size is 101 and 101 samples were selected from 467,123 water purifier at the beginning of 2021 using MS Excel Software in this monitoring period.</p> <p>The water sample is taken at water outlet of the project water purifiers from the 101 samples and project owner Entrust a third-party testing agency - a microbiology laboratory affiliated with the Kenya Bureau of Standards (KEBS) to test the water quality. Refer to Section C for the specific execution process.</p> <p>From the laboratory test report, the monitoring parameters and monitoring methods are shown in the following table:</p> <table border="1"> <thead> <tr> <th>Parameters</th><th>Test Method No.</th></tr> </thead> <tbody> <tr> <td>E.Coli</td><td>TES/MIC/TM/14</td></tr> <tr> <td>Pseudomonas aeruginosa fluorescence</td><td>TES/MIC/TM/12B</td></tr> <tr> <td>Salmonella</td><td>TES/MIC/TM/15</td></tr> <tr> <td>Staphylococcus aureus</td><td>TES/MIC/TM/27*</td></tr> <tr> <td>Streptococcus Faecalis</td><td>TES/MIC/TM/21B</td></tr> </tbody> </table>	Parameters	Test Method No.	E.Coli	TES/MIC/TM/14	Pseudomonas aeruginosa fluorescence	TES/MIC/TM/12B	Salmonella	TES/MIC/TM/15	Staphylococcus aureus	TES/MIC/TM/27*	Streptococcus Faecalis	TES/MIC/TM/21B
Parameters	Test Method No.												
E.Coli	TES/MIC/TM/14												
Pseudomonas aeruginosa fluorescence	TES/MIC/TM/12B												
Salmonella	TES/MIC/TM/15												
Staphylococcus aureus	TES/MIC/TM/27*												
Streptococcus Faecalis	TES/MIC/TM/21B												
Monitoring frequency	<p>Annual sampling, and the first round of testing shall be conducted at least after six months from the start date.</p> <p>For this project, the start date is 09/10/2020 and sales plan for the first year was completed within two months, the water quality test conducted on 02/06/2021-11/06/2021, therefore, the date of first round of testing meets the requirements of at least after six months from the start date.</p>												

QA/QC procedures	<ol style="list-style-type: none"> 1. Laboratories used for water quality testing must be approved by local health authorities and/or have quality accreditation; and 2. The laboratory used must demonstrate that it has an adequate quality management plan in place which addresses both quality assurance and quality control test procedures. 3. Field testing kits also are eligible, e.g., based on Colony Forming Unit method or Most Probable Number method. To use the field testing kits the project shall meet the following requirements: <ol style="list-style-type: none"> a. Testing kits must be approved by national agency or meet standards set by relevant international organization e.g., US-EPA, and b. Testing kits shall be tested for its accuracy and robustness prior to application for project level monitoring, whereby local or accredited laboratory shall conduct water quality tests using testing kits and a relevant ISO standard or an equivalent standard, in parallel with field testing kits.
Purpose of data	To demonstrate contribution to SDG 6 and SDG 13.
Additional comment	<p>If the proportion of samples not meeting Safe Drinking Water Quality Standards exceeds a threshold, no emission reductions can be claimed for the corresponding monitoring period.</p> <p>Thresholds:</p> <ul style="list-style-type: none"> - Project or VPA year 1: 20% - Project or VPA year 2: 15% - Project or VPA year 3 or above: 10% <p>When the crediting period is renewed, the year number count continues, i.e., the second crediting period would encompass year 6, year 7, year 8, etc.</p> <p>Additionally, when the threshold is exceeded, the project shall provide an explanation for why this occurred and provide a remediation plan.</p>

Parameter ID	SDWS 25
Data/parameter	$HN_{p,y}$
Unit	Number

Description	Number of individuals per premises type p in the project boundary in year y
Source of data	Project Survey
Value(s) applied	3.94
Measurement methods and procedures	<p>The project survey can be conducted carried out together with WCFT. 101 samples are sufficient to represent the entire end-user of 467,123 in this monitoring period and 101 samples were selected from 467,123 End-user by stratified sampling method.</p> <p>The project was conducted on 18/01/2021-28/01/2021 and the project questionnaires were filled by the 101 samples, and then summarize the survey results into an Excel table.</p> <p>This project survey contained 101 sample users, including 398 individuals. So, $HN_{p,y}$ can be calculated as $398/101=3.94$.</p>
Monitoring frequency	Annually
QA/QC procedures	The value applied shall be cross-checked against at least one other source on the list. For cross-check purposes, sources applied may be up to 5 years old. Further, cross-check with older sources may be used provided they provide conservative results.
Purpose of data	To demonstrate contribution to SDG 13.
Additional comment	As per <i>2019 Kenya Population and Housing Census Volume I: Population by County and Sub-county</i> ²² , there are 1,647,507 households and 6,421,177 people in Makueni County, Trans Nzoia County, Kirinyaga County, Bungoma County and Nakuru County of Kenya. Number of individuals per household can be calculated as $6,421,177/1,647,507=3.9$, which is consistent with the project survey result.

Parameter ID	SDWS 28
Data / Parameter	$N_{p,y}$
Unit	Number
Description	Accumulated number of premises type p with at least one individual project technology in year y

²² <https://www.knbs.or.ke/?wpdmpromo=2019-kenya-population-and-housing-census-volume-i-population-by-county-and-sub-county>

Source of data	Sales database																																			
Value(s) applied	<p>In order to cover more households with high-quality water purifiers at a lower price, it is restricted in the project that each household can only buy one set of water purifier. According to the sales database, the number of water purifiers sold in this monitoring period, the results of the parameter are:</p> <table><tr><th>Year</th><th>The water purifiers sold in year y (Sets)</th><th>$N_{d,y}$ (Sets)</th></tr><tr><td>09/10/2020-31/10/2020</td><td>215,237</td><td>215,237</td></tr><tr><td>01/11/2020-30/11/2020</td><td>251,886</td><td>467,123</td></tr><tr><td>01/12/2020-31/12/2020</td><td>0</td><td>467,123</td></tr><tr><td>01/01/2021-31/01/2021</td><td>0</td><td>467,123</td></tr><tr><td>01/02/2021-28/02/2021</td><td>0</td><td>467,123</td></tr><tr><td>01/03/2021-31/03/2021</td><td>0</td><td>467,123</td></tr><tr><td>01/04/2021-30/04/2021</td><td>0</td><td>467,123</td></tr><tr><td>01/05/2021-31/05/2021</td><td>0</td><td>467,123</td></tr><tr><td>01/06/2021-30/06/2021</td><td>0</td><td>467,123</td></tr><tr><td>01/07/2021-31/07/2021</td><td>0</td><td>467,123</td></tr></table>			Year	The water purifiers sold in year y (Sets)	$N_{d,y}$ (Sets)	09/10/2020-31/10/2020	215,237	215,237	01/11/2020-30/11/2020	251,886	467,123	01/12/2020-31/12/2020	0	467,123	01/01/2021-31/01/2021	0	467,123	01/02/2021-28/02/2021	0	467,123	01/03/2021-31/03/2021	0	467,123	01/04/2021-30/04/2021	0	467,123	01/05/2021-31/05/2021	0	467,123	01/06/2021-30/06/2021	0	467,123	01/07/2021-31/07/2021	0	467,123
Year	The water purifiers sold in year y (Sets)	$N_{d,y}$ (Sets)																																		
09/10/2020-31/10/2020	215,237	215,237																																		
01/11/2020-30/11/2020	251,886	467,123																																		
01/12/2020-31/12/2020	0	467,123																																		
01/01/2021-31/01/2021	0	467,123																																		
01/02/2021-28/02/2021	0	467,123																																		
01/03/2021-31/03/2021	0	467,123																																		
01/04/2021-30/04/2021	0	467,123																																		
01/05/2021-31/05/2021	0	467,123																																		
01/06/2021-30/06/2021	0	467,123																																		
01/07/2021-31/07/2021	0	467,123																																		
Measurement methods and procedures	Sale database will be recorded and maintained according to the monitoring plan.																																			
Monitoring frequency	Annually																																			
QA/QC procedures	The number of water purifiers sold will be cross checked by the purchase receipt. The water purifier in this monitoring period was sold on 09/10/2020-30/11/2020 and all the water purifiers were put into operation on 01/12/2020 which is within the normal technical lifetime (the technical lifetime of the equipment shall not be less than 15 years), so the 467,123 water purifiers were counted in $N_{p,y}$.																																			
Purpose of data	To demonstrate contribution to SDG 6 and SDG 13.																																			
Additional comment	Units shall not be counted in $N_{d,y}$ after the end of their technical life, unless this is addressed by the measures to manage the cases where the expected technical life of the project technology is shorter than the crediting period.																																			

Parameter ID	SDWS 31
Data / Parameter	$DP_{p,y}$
Unit	Days

Description	Average days the project technology is present for end-users in the premises p in year y																						
Source of data	Sales database																						
Value(s) applied	<p>According to the sales database, the average days the project technology is present for end-users in the premises shown in the following table:</p> <table> <tr> <th>Year</th><th>Average days the project technology is present for end-users in the premises</th></tr> <tr> <td>10/10/2020²³-31/10/2020</td><td>10</td></tr> <tr> <td>01/11/2020-30/11/2020</td><td>21</td></tr> <tr> <td>01/12/2020-31/12/2020</td><td>31²⁴</td></tr> <tr> <td>01/01/2021-31/01/2021</td><td>31</td></tr> <tr> <td>01/02/2021-28/02/2021</td><td>28</td></tr> <tr> <td>01/03/2021-31/03/2021</td><td>31</td></tr> <tr> <td>01/04/2021-30/04/2021</td><td>30</td></tr> <tr> <td>01/05/2021-31/05/2021</td><td>31</td></tr> <tr> <td>01/06/2021-30/06/2021</td><td>30</td></tr> <tr> <td>01/07/2021-31/07/2021</td><td>31</td></tr> </table>	Year	Average days the project technology is present for end-users in the premises	10/10/2020 ²³ -31/10/2020	10	01/11/2020-30/11/2020	21	01/12/2020-31/12/2020	31 ²⁴	01/01/2021-31/01/2021	31	01/02/2021-28/02/2021	28	01/03/2021-31/03/2021	31	01/04/2021-30/04/2021	30	01/05/2021-31/05/2021	31	01/06/2021-30/06/2021	30	01/07/2021-31/07/2021	31
Year	Average days the project technology is present for end-users in the premises																						
10/10/2020 ²³ -31/10/2020	10																						
01/11/2020-30/11/2020	21																						
01/12/2020-31/12/2020	31 ²⁴																						
01/01/2021-31/01/2021	31																						
01/02/2021-28/02/2021	28																						
01/03/2021-31/03/2021	31																						
01/04/2021-30/04/2021	30																						
01/05/2021-31/05/2021	31																						
01/06/2021-30/06/2021	30																						
01/07/2021-31/07/2021	31																						
Measurement methods and procedures	<p>Based on the records of "Date of sale", the number of present days for end user of each water purifier per month is determined. The specific calculation formula is:</p> <p>Sum up the present days for end user of each water purifier / the total number of water purifier.</p>																						
Monitoring frequency	Annually																						
QA/QC procedures	N/A																						
Purpose of data	To demonstrate contribution to SDG 6 and SDG 13.																						
Additional comment	N/A																						

²³ According to usage rate survey, among the users surveyed, there are users who used it on the day of purchase. While, based on conservative considerations, in the calculation of emission reductions, it is considered that the water purifiers are used on the second day of purchase, i.e., 10/10/2020.

²⁴ As sales plan for the first year was completed within two months (09/10/2020-30/11/2020), so from December 2020 to July 2021, the number of present days for end user of each water purifier in this month is equal to the number of days in this month.

Parameter ID	SDWS 29
Data / Parameter	$U_{p,y}$
Unit	%
Description	Usage rate of the project technology by premises type p during year y
Source of data	Annex 1: Usage Surveys Guidelines – HWT Technologies. For this monitoring period, this parameter was from the Usage rate survey.
Value(s) applied	89
Measurement methods and procedures	<p>In-person survey of project households following Annex 1 of the applied GS methodology. Households that show at least once-in-two-days use may be counted as users. The resulting fraction is multiplied by 100% to get $U_{p,y}$. The minimum total sample size is 100, with at least 30 samples for project technologies of each age being credited.</p> <p>For this project, the sold of Multi-Layer water purifiers started on 09/10/2020 and sales plan for the first year was completed within two months. So, all water purifiers involved in this monitoring period have the same age. 100 samples were selected from the 467,123 End-users by random survey method using MS Microsoft Excel at the beginning of 2021. The monitoring activities has been conducted on 01/02/2021²⁵.</p> <p>Also, in line with the usage survey guideline of Annex 1 of the applied GS methodology, the usage rate monitoring cover six topics: Introductory question and water treatment, Rate of usage, Water storage, Physical signs of usage, Demonstration & knowledge and Functionality.</p> <p>The usage rate of this monitoring period is $89/100 \times 100\% = 89\%$.</p>
Monitoring frequency	Annually
QA/QC procedures	Water Consumption Field Test (WCFT) may be used to cross check the usage percentage. In this monitoring period, the results of WCFT show that users consumed the filtered water from the water purifier every day. Therefore, from the perspective of WCFT, the

²⁵ Since the monitoring period of this project covers only 3 months in 2020, and all the water purifiers put into operation on 01/12/2020. This monitoring period is only 10 months, less than a year, so the 101 samples in 2021 can be representative the entire monitoring period.

	usage rate of the water purifier is 100%. However, we also conducted a usage survey and defined that the households at least once-in-two-days use may be counted as users. The usage survey results show that the usage rate of the project is 89%. Considering the conservative principle, the usage rate used to calculate emission reductions is 89%.
Purpose of data	To demonstrate contribution to SDG 6 and SDG 13.
Additional comment	The usage survey provides a single usage parameter that is representative for project technologies in the total sales record.

SDG 13

Parameter ID	<i>SDWS 24</i>
Data / Parameter	QPW_p
Unit	Liters/person/day
Description	Volume of drinking water per person per day for premises type p
Source of data	Water Consumption Field Test (WCFT)
Value(s) applied	For this monitoring period, the result of 3.78 L/person/day from WCFT was used which meet the requirement of methodology-capped at 5.5L per person per day.
Measurement methods and procedures	<p>The WCFT has been conducted with end user's representative of the project scenario target population and currently using the project technology. The WCFT must be designed to ensure that monitoring is representative of typical technology use practices and that:</p> <ul style="list-style-type: none"> - it is transparent and can easily be replicated, - it is evidently conservative, - the sample is randomly selected so as to not introduce a material bias, and - the impact of daily and seasonal variations on the expected average water consumption is accounted for <p>The WCFT must be conducted over 3 days, not including weekends, and averaged value (L/person/day) value should be determined after excluding outliers.</p> <p>It must be made explicit to the households that they must behave and consume water normally, reflecting typical daily</p>

	<p>water consumption pattern. Minimum sample size is 30. Any sampling methods can be used, provided that the sample is selected randomly.</p> <p>For this project, the sold of Multi-Layer water purifiers started on 09/10/2020 and sales plan for the first year was completed within two months. So, all water purifiers involved in this monitoring period have the same age. 101 samples were selected from the 467,123 End-users by random survey method using MS Microsoft Excel at the beginning of 2021. The monitoring activities has been conducted on 18/01/2021 to 21/01/2021(four days) and 25/01/2021 to 28/01/2021(four days), which is not the weekends and holidays²⁶.</p> <p>The daily water consumption survey record forms²⁷ have been filled by end-user. Sum each water consumption record can get the daily water consumption.</p> <p>The mean value of the total water consumption (the total water filtered per day aggregated over a three-day period) was the final value QPW_p per end user.</p> <p>The volume of drinking water per person per day of this monitoring period is 3.78 L/person/day.</p>
Monitoring frequency	Every two years
QA/QC procedures	-
Purpose of data	To demonstrate contribution to SDG 13.
Additional comment	The value is capped at 5.5 L/person/day, which is determined based on WHO recommendations (Domestic Water Quantity,

²⁶ Since the monitoring period of this project covers only 3 months in 2020, and all the water purifiers put into operation on 01/12/2020. Also, this monitoring period is only 10 months, less than a year. As applied methodology, the monitoring of WCFT lasts for 4 days and cannot be done on weekends and holidays. There are many holidays in December 2020, so it is not suitable for monitoring activities of WCFT. So, the 101 samples in 2021 can be representative the entire monitoring period.

²⁷ The form contains the basic information of the sample users, the start time of water use, the end time of water use, the daily safe water volume in water purifier, the raw water volume in calibration bucket.

	Service Level and Health, Table 2: Volumes of water required for hydration, WHO (2003). https://www.who.int/water_sanitation_health/diseases/WSH03.02.pdf .
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Parameter ID	SDWS 32
Data / Parameter	$DN_{p,y}$
Unit	Number
Description	Average number of individual project technologies in each project premises type p in year y
Source of data	Sales database
Value(s) applied	In order to cover more households with high-quality water purifiers at a lower price, it is restricted in the project that each household can only buy one set of water purifier.
Measurement methods and procedures	Based on the sales records of "Quantity of project technologies sold" and identifying information of buyer/recipient, calculate the average number of project devices per household.
Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	To demonstrate contribution to SDG 13.
Additional comment	N/A

Parameter ID	SDWS 30
Data / Parameter	$t_{p,y}$
Unit	Hours per day
Description	Usage time of the project technology by premises type p in year y
Source of data	<i>Methodology for Emission Reductions from Safe Drinking Water Supply</i> (Version 1.0)
Value(s) applied	5 hours.
Measurement methods and procedures	Option 3. Default of 5 hours.
Monitoring frequency	Annually
QA/QC procedures	-

Purpose of data	To demonstrate contribution to SDG 13.
Additional comment	N/A

Parameter ID	SDWS 22
Data / Parameter	$X_{cleanboil,y}$
Unit	%
Description	Proportion of project households that boil safe (treated, or from safe supply) water after installation of project technology in year y
Source of data	Project survey
Value(s) applied	0% from project survey was be taken.
Measurement methods and procedures	<p>The project survey can be conducted carried out together with WCFT. 101 samples are sufficient to represent the entire end-user of 467,123 in this monitoring period and 101 samples were selected from 467,123 End-user by stratified sampling method.</p> <p>The project was conducted on 18/01/2021-28/01/2021 and the project questionnaires were filled by the 101 samples, and then summarize the survey results into an Excel table.</p> <p>This project survey contained 101 sample users, including 0 individuals that boil safe (treated, or from safe supply) water after installation of water purifier. So, $X_{cleanboil,y}$ is 0%.</p>
Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	To demonstrate contribution to SDG 13.
Additional comment	N/A

Parameter ID	SDWS 35
Data / Parameter	LE_y
Unit	tCO ₂ e per year
Description	Leakage emissions during year y
Source of data	Sources established by following Leakage emissions section

Value(s) applied	<p>The leakage emissions for this monitoring period as shown in the table below:</p> <table> <tr> <th>Time</th><th>Leakage emissions (tCO₂e)</th></tr> <tr> <td>10/10/2020-31/10/2020</td><td>245</td></tr> <tr> <td>01/11/2020-30/11/2020</td><td>1,105</td></tr> <tr> <td>01/12/2020-31/12/2020</td><td>1,631</td></tr> <tr> <td>01/01/2021-31/01/2021</td><td>1,631</td></tr> <tr> <td>01/02/2021-28/02/2021</td><td>1,473</td></tr> <tr> <td>01/03/2021-31/03/2021</td><td>1,631</td></tr> <tr> <td>01/04/2021-30/04/2021</td><td>1,578</td></tr> <tr> <td>01/05/2021-31/05/2021</td><td>1,631</td></tr> <tr> <td>01/06/2021-30/06/2021</td><td>1,578</td></tr> <tr> <td>01/07/2021-31/07/2021</td><td>1,631</td></tr> <tr> <td>total</td><td>14,134</td></tr> </table>	Time	Leakage emissions (tCO ₂ e)	10/10/2020-31/10/2020	245	01/11/2020-30/11/2020	1,105	01/12/2020-31/12/2020	1,631	01/01/2021-31/01/2021	1,631	01/02/2021-28/02/2021	1,473	01/03/2021-31/03/2021	1,631	01/04/2021-30/04/2021	1,578	01/05/2021-31/05/2021	1,631	01/06/2021-30/06/2021	1,578	01/07/2021-31/07/2021	1,631	total	14,134
Time	Leakage emissions (tCO ₂ e)																								
10/10/2020-31/10/2020	245																								
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01/06/2021-30/06/2021	1,578																								
01/07/2021-31/07/2021	1,631																								
total	14,134																								
Measurement methods and procedures	<p>As per section 3.8 of the applied GS methodology: If the ex-ante evaluation shows that leakage emissions are less than 5% of total emission reductions, then no monitoring is needed, and emission reductions simply shall be adjusted 5% down of the total emission reductions.</p> <p>According to PDD, the leakage emissions in ex-ante evaluation are less than 5% of total emission reductions, so, the leakage emissions for this monitoring period is 5% of the total emission reductions.</p>																								
Monitoring frequency	Every two years.																								
QA/QC procedures	Compliance with the general requirements for sampling and general requirements for data and information sources																								
Purpose of data	To demonstrate contribution to SDG 13.																								
Additional comment	N/A																								

SDG 8

Parameter ID	<i>SDWS 19</i>
Data / Parameter	<i>Number of males and females employed</i>
Unit	Number
Description	Jobs created for both men and women.
Source of data	Employment records
Value(s) applied	12 jobs are created including 6 males and 6 females.

Measurement methods and procedures	The number of persons employed was calculated based on the employment records and cross checked by the labor contracts.
Monitoring frequency	Once for each monitoring period.
QA/QC procedures	Data was collected using the standard procedures and was stored for the crediting period and an additional two years after the end of the crediting period or the last issuance of GS VERs for this project activity, whichever occurs later.
Purpose of data	To demonstrate contribution to SDG 8.
Additional comment	N/A

Parameter ID	<i>SDWS 19</i>
Data / Parameter	Percentage of employees with salaries paid at par with the average wage of Kenya.
Unit	%
Description	This parameter will be collected to indicate the project provides decent work for both men and women.
Source of data	Employment Payroll and average wages in Kenya based on most recent information available.
Value(s) applied	Kenya's Average monthly Wage Earnings data was reported at 147,000 KES in 2021 ²⁸ . The actual average monthly wage of the employees was 235,000KES which higher than that of Kenya in 2021. Therefore, 100% is taken.
Measurement methods and procedures	The number of employees that are paid at par with the average wage of Kenya/The number of jobs created*100%.
Monitoring frequency	Once for each monitoring period.
QA/QC procedures	Data was collected using the standard procedures and was stored for the crediting period and an additional two years after the end of the crediting period or the last issuance of GS VERs for this project activity, whichever occurs later.

²⁸

<http://www.salaryexplorer.com/salary-survey.php?loc=111&loctype=1#:~:text=A%20person%20working%20in%20Kenya%20typically%20earns%20around%20147%2C000%20KES,%2C%20transport%2C%20and%20other%20benefits.>

The average salary is 147,000KES, the average salary of employee in proposed project is 235,000 KES which higher than 147,000KES, so the Percentage of employees with salaries paid at par with the average wage of Kenya is 100%.

Purpose of data	To demonstrate contribution to SDG 8.
Additional comment	N/A

D.3. Comparison of monitored parameters with last monitoring period

This monitoring period for the project is 10/10/2020-31/07/2021, which is the first monitoring period, and the parameters are monitored for the first time, and there is no other data to compare.

D.4. Implementation of sampling plan

>>

The sampling approach is to be used for following surveys and tests as summarized below:

D.4.1. Project Survey and WCFT

According to PDD, the project survey and WCFT can be conducted together. For project survey, as the number of water purifier End-user is greater than 1000, so the minimum sample size for project survey is 100. For WCFT statistical analysis, 90/10 precision level was selected and the calculation of the sample size for the survey was based upon a 0.6 Coefficient of Variation (COV) under a 90/10 approach as provided in Table 3 of Annex 4 of TPDDTEC (Version 3.1), i.e., the sample size for WCFT is 101. So, the sample size for project survey and WCFT is 101.

The sampling process started as soon as the target population is determined and finished before the beginning of monitoring activities. 101 sample users were selected from the 467,123 End-user at the beginning of 2021²⁹ according to the random sampling method for project survey and WCFT.

The monitoring team implemented the sampling investigation strictly follow the monitoring plan. The project survey questionnaires and the Water consumption survey record form were collected. According to the TPDDTEC (Version 3.1), confidence/precision for water consumption volume have been calculated and checked using the method of the endpoints of the 90% confidence interval lie within +/- 10% of the estimated mean. The specific formula is as follows:

²⁹ Since the monitoring period of this project covers only 3 months in 2020, and all the water purifier put into operation on 01/12/2020. Also, this monitoring period is only 10 months, less than a year. As applied methodology, the monitoring of WCFT lasts for 4 days and cannot be done on weekends and holidays. There are many holidays in December 2020, so it is not suitable for monitoring activities of WCFT. So, the 101 samples in 2021 can be representative the entire monitoring period.

1.The endpoints of the 90% confidence interval is calculated with the equation below:

$$\text{The endpoints of the 90\% confidence interval} = \bar{X} \pm Z_{\alpha/2} * \frac{\sigma}{\sqrt{n}} \quad (1)$$

\bar{X}	Mean value of the water consumption(L/person/day)
Z	1.65
σ	Standard deviation of the water consumption
n	Sample size

2. The +/- 10% of the estimated mean is shown in the table below:

Table 3 The +/- 10% of the estimated mean

Category/Time	Day 2	Day 3	Day 4
Water consumption (L/person/day)	3.79	3.76	3.80
Average Water consumption (L/person/day)	3.78		
+10% of the Average Water consumption (L/person/day)	4.16		
-10% the Average Water consumption (L/person/day)	3.41		

After calculation, the endpoint of the 90% confidence interval is [3.78,3.79], +/- 10% of the estimated mean is [3.41, 4.16]. so, the 101 sample survey of WCFT are sufficient to satisfy the desired confidence and precision.

D.4.2. Usage Survey

According to PDD, the minimum total sample size for Usage Survey is 100, with at least 30 samples for project technologies of each age being credited. The majority of interviews in a usage survey must be conducted in person. Thus, if technologies of age 1-5 are credited, the usage survey must include 30 representative samples from each age for total of 150 samples. The resulting usage parameter should be weighted based on the proportion of technologies in the borehole database of each age. As the sold time of Multi-Layer water purifiers started on 09/10/2020 and sales plan for the first year was completed within two months. So, all water purifiers involved in this monitoring period have the same age, so the sample size is 100 for this monitoring period.

The sampling process started as soon as the target population is determined and finished before the beginning of monitoring activities. 100 sample users were selected from the 467,123 End-

user at the beginning of 2021³⁰ according to the random sampling method by Microsoft Excel. The data was stored in the Excel database.

D.4.3. Water Quality Testing and Water Hygiene Education Campaigns

According to PDD, the water quality testing and water hygiene education campaigns can be conducted together. 90/10 precision rule was selected and the calculation of the sample size for water quality testing and water hygiene education campaigns was based upon a 0.6 Coefficient of Variation (COV) under a 90/10 approach as provided in Table 3 of Annex 4 of TPDDTEC (Version 3.1), i.e., the sample size for water quality testing and water hygiene education campaigns is 101.

The sampling process started as soon as the target population is determined and finished before the beginning of monitoring activities. 101 sample users were selected from the 467,123 End-user at the beginning of 2021 according to the random sampling method for water quality testing and water hygiene education campaigns.

SECTION E. CALCULATION OF SDG IMPACTS

E.1. Calculation of baseline value or estimation of baseline situation of each SDG Impact

>>

Baseline impact of SDG 13 Climate Action

As per section 3.6 of the applied GS methodology, baseline emissions can be calculated as follows:

$$EF_b = SE_{w,b,y} * \sum_f (x_f * (EF_{b,f,CO2} * f_{NRB,f,y} + EF_{b,f,nonCO2})) \div 10^9 \quad (2)$$

As per results of baseline survey, among those who treat drinking water by boiling, the main fuel used are non-renewable biomass of firewood, charcoal and LPG. EF_b can be calculated as the following equation.

$$EF_b = SE_{w,b,y} * (x_{firewood} * (EF_{b,firewood,CO2} * f_{NRB} + EF_{b,firewood,nonCO2}) + x_{charcoal} * (EF_{b,charcoal,CO2} * f_{NRB} + EF_{b,firewood,nonCO2}) + x_{LPG} * (EF_{b,LPG,CO2} + EF_{b,LPG,nonCO2})) \div 10^9 \quad (3)$$

³⁰ Since the monitoring period of this project covers only 3 months in 2020, and all the water purifiers put into operation on 01/12/2020. This monitoring period is only 10 months, less than a year, so the 101 samples in 2021 can be representative the entire monitoring period.

Where:

Parameters	Description	Source/value
EF_b	Emission factor for the use of fuel to obtain safe water in the baseline (tCO ₂ e/L)	Calculated as Equation (3), Makueni (2.713*10 ⁻⁴), Trans Nzoia (2.374*10 ⁻⁴), Kirinyaga (2.848*10 ⁻⁴). Bungoma (2.356*10 ⁻⁴) and Nakuru (1.493*10 ⁻⁴)
$SE_{w,b,y}$	Specific energy required to boil water (kJ/L)	Calculated as Equation (4), Makueni (2,793.52), Trans Nzoia (2,440.91), Kirinyaga (3,207.38). Bungoma (2,465.08) and Nakuru (1,576.60)
$x_{firewood}$	Proportion of firewood used in the baseline (fraction)	Baseline survey, Makueni (81.3%), Trans Nzoia (78.3%), Kirinyaga (93.1%). Bungoma (79.7%) and Nakuru (56.7%)
$x_{charcoal}$	Proportion of charcoal used in the baseline (fraction)	Baseline survey, Makueni (18.8%), Trans Nzoia (19.6%), Kirinyaga (6.9%). Bungoma (17.4%) and Nakuru (21.6%)
x_{LPG}	Proportion of LPG used in the baseline (fraction)	Baseline survey, Makueni (0%), Trans Nzoia (2.2%), Kirinyaga (0%). Bungoma (2.9%) and Nakuru (21.6%)
$EF_{b,firewood,CO2}$	CO ₂ emission factor from use of firewood (tCO ₂ /TJ)	IPCC 2006 default value for wood (Table 1.4 of Chapter 1 Introduction), 112 tCO ₂ /TJ
$EF_{b,firewood,nonCO2}$	Non-CO ₂ emission factor arising from use of firewood (tCO ₂ e/TJ)	<i>Methodology for Emission Reductions from Safe Drinking Water Supply</i> (Version 1.0), 9.46t/TJ
$EF_{b,charcoal,CO2}$	CO ₂ emission factor from use of charcoal (tCO ₂ /TJ)	<i>Methodology for Emission Reductions from Safe Drinking Water Supply</i> (Version 1.0), 165.22 tCO ₂ /TJ (includes charcoal production emissions)
$EF_{b,charcoal,nonCO2}$	Non-CO ₂ emission factor arising from use of charcoal (tCO ₂ e/TJ)	<i>Methodology for Emission Reductions from Safe Drinking Water Supply</i> (Version 1.0), 44.83t/TJ (includes production emissions of CH ₄ and N ₂ O)
$EF_{b,LPG,CO2}$	CO ₂ emission factor from use of LPG (tCO ₂ /TJ)	IPCC 2006 default value for wood (Table 1.4 of Chapter 1 Introduction), 63.1 tCO ₂ /TJ
$EF_{b,LPG,nonCO2}$	Non-CO ₂ emission factor arising from use of LPG (tCO ₂ e/TJ)	Calculated as Equation (5), 0.1665t/TJ
$f_{NRB,f,y}$	Fractional non-renewability status of woody biomass fuel during year y, in case the baseline fuel is biomass or charcoal	Baseline survey, 66.4% and fixed for the first crediting period.
f	Index for baseline fuel types	Baseline survey, the baseline fuel types are firewood, charcoal and LPG.

The specific energy required to boil water using the baseline technology ($SE_{w,b,y}$) is determined as follows, by calculating the energy input required to obtain 1 L of boiling water, including boiling and vaporization losses.

$$SE_{w,b,y} = 360.83/\eta_{wb} \quad (4)$$

Where:

- 360.83 Default amount of energy required to boil 1 L of water from a first principles approach
Efficiency of the baseline water boiling (%). Weighted average of baseline stove types. Default efficiency: 10% for three-stone stove, 20% for conventional stove, 30% for improved stove.
- η_{wb} 50% for LPG stove based on manufacturer specification. Based on the results of baseline survey, η_{wb} of each County: Makueni (12.9%), Trans Nzoia (14.8%), Kirinyaga (11.3%). Bungoma (14.6%) and Nakuru (22.9%)

$$EF_{b,LPG,nonCO2} = LPG \text{ Emission } CH_4 \text{ Conversion Factor} * GWP_{CH4} + LPG \text{ Emission } N_2O \text{ Conversion Factor} * GWP_{N2O} \quad (5)$$

As per Table 2.5 of Chapter 2 Stationary Combustion of IPCC 2006, *LPG Emission CH₄ Conversion Factor* is 0.005t/TJ, *LPG Emission N₂O Conversion Factor* is 0.0001t/TJ.

As per Table 8.7 of *2013 Climate Change 2013 The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (IPCC)³¹, GWP₁₀₀ of CH₄ is 28 (no climate-carbon feedbacks, cc fb) and GWP₁₀₀ of N₂O is 265 (no climate-carbon feedbacks, cc fb).

Based on Equation (5), $EF_{b,LPG,nonCO2} = 0.005t/TJ * 28 + 0.0001t/TJ * 265 = 0.1665t/TJ$

Next, calculate the baseline emissions.

$$BE_y = EF_b * (1 - C_b - X_{cleanboil,y}) * Q_y * M_{q,y} \quad (6)$$

Where:

Parameters	Description	Source/value
BE_y	Baseline emissions from the use of fuel to obtain safe water in the baseline (tCO ₂ e)	Calculated as Equation (6)
C_b	Proportion of project households who in the baseline were already using a safe water supply that did not require boiling it (%)	Baseline survey, 20.0%

³¹ <https://www.ipcc.ch/report/ar5/wg1/>

$X_{cleanboil,y}$	Proportion of project households that boil safe water in the project year y (%)	project survey, 0% applied for this monitoring period.
Q_y	Quantity of safe drinking water provided by the project in year y (L)	Calculated based on Method 2 for household water treatment technologies, Calculated as Equation (7)
$M_{q,y}$	Modifier for the water quality in year y	Based on water quality test conducted in this monitoring period, the actual value is 100%.

The quantity of safe drinking water provided by the project (Q_y) can be calculated using Method 2, which applies to projects using household water treatment technologies.

$$Q_y = \sum_p N_{p,y} * U_{p,y} * QPW_{hh,p,y} * DP_{p,y} \quad (7)$$

Where:

Parameters	Description	Source/value
$N_{p,y}$	Number of premises type p with at least one project technology in year y	Sales database, in this monitoring period, this parameter is 467,123
$U_{p,y}$	Usage rate of the project technology by premises type p during year y (%)	Usage rate survey. 89/100=89% is applied in this monitoring period.
$QPW_{hh,p,y}$	Volume of drinking water per premises p per day in year y (L)	Calculated as Equation (8), 15
$DP_{p,y}$	Days the project technology is present for end-users in the premises p in year y	The actual value was determined based on the sales database. 1 is applied.

The volume of drinking water per household per day is determined by considering whether the capacity of the project device is sufficient to provide at least the default amount of drinking water, as follows.

$$QPW_{hh,p,y} = \min((q_i * t_{p,y} * DN_{p,y}), (QPW_p * HN_{p,y})) \quad (8)$$

Where:

Parameters	Description	Source/value
q_i	Capacity of the household water treatment technology (L/h)	Manufacturer specifications, 3
$t_{p,y}$	Usage time of the project technology by premises type p in year y (h/day)	Option 3 Default value of 5 hours will be used.
$DN_{p,y}$	Average number of individual project technologies in each project premises type p in year y	The actual value was determined based on sales database in this monitoring period. 1 was applied.

$HN_{p,y}$	Number of individuals per premises type p in year y	The actual value was determined based on project survey. result of 3.98 from project survey was used.
QPW_p	Volume of drinking water per person per day for premises type p (L)	The actual value was determined based on Water Consumption Field Tests. The result of 3.78 L/person/day from project survey was used.

The calculation of baseline emissions:

The result is summarized in the table below:

Table 4 The calculation results of baseline emission in this monitoring periods

Date	Proportion of project households who in the baseline were already using a safe water supply that did not require boiling it (%)	Proportion of project households that boil safe water in the project year y (%)	The quantity of safe drinking water provided by the project	Modifier for the water quality	Baseline Emission in this month
	C_b	$X_{cleanboil,y}$	$Q_y(L)$	$M_{q,y}$	BE_y (tCO _{2e})
10/10/2020-31/10/2020	20%	0%	28,529,552	100%	5,139
01/11/2020-30/11/2020	20%	0%	130,025,513	100%	23,191
01/12/2020-31/12/2020	20%	0%	191,942,423	100%	34,237
10/10/2020-31/12/2020	-	-	350,497,488	-	62,567
01/01/2021-31/01/2021	20%	0%	191,942,423	100%	34,237
01/02/2021-28/02/2021	20%	0%	173,367,350	100%	30,923
01/03/2021-31/03/2021	20%	0%	191,942,423	100%	34,237
01/04/2021-30/04/2021	20%	0%	185,750,732	100%	33,133
01/05/2021-31/05/2021	20%	0%	191,942,423	100%	34,237
01/06/2021-30/06/2021	20%	0%	185,750,732	100%	33,133
01/07/2021-31/07/2021	20%	0%	191,942,423	100%	34,237

01/01/2021-31/07/2021	-	-	1,663,135,996	-	234,137
Total: 10/10/2020-31/07/2021					296,704

Total baseline impact of SDG13 in the 1st monitoring period (10/10/2020-31/07/2021) is 296,704 tCO₂e.

Table 5 Baseline impact of SDG6, SDG7 and SDG8

Target	Baseline impact
SDG6	In the absence of the project activity, no project water purifiers would be sold, so, the total number of person.days served with satisfactory level of safe water is 0,i.e., the baseline outcome benefit of SDG6 is 0.
SDG7	In the absence of the project activity, no project water purifiers would be sold. Therefore, the baseline outcome benefit is 0.
SDG8	In baseline scenario, this project did not exist, so the number of males and females employed by the project is 0, the Percentage of employees with salaries paid at par with the average wage of Kenya is 0. Therefore, the baseline outcome benefit is 0.

E.2. Calculation of project value or estimation of project situation of each SDG Impact

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SDG 6 Clean Water and Sanitation

Total number of person.days served with satisfactory level of safe water can be calculated as follows:

$$\text{Project outcome of SDG6} = N_{p,y} * HN_{p,y} * DP_{p,y} * U_{p,y} * M_{q,y} \quad (9)$$

Where,

Parameters	Description	Source/Value
$N_{p,y}$	Number of premises type p with at least one project technology in year y	Sales database
$HN_{p,y}$	Number of individuals per premises type p in year y	3.94=398/101 from Project survey shall be used.
$DP_{p,y}$	Days the project technology is present for end-users in the premises p in year y	The value of this parameter please refer to Table 4 above.
$U_{p,y}$	Usage rate of the project technology by premises type p during year y .	Usage survey, 89/100=89% was applied.
$M_{q,y}$	Ongoing water quality indicated as the fraction of the samples that pass microbial quality standard requirements specified in relevant microbial quality standard for drinking water of Kenya.	$M_{q,y}$ =100% based on Water quality test

The calculation results are shown in the table below:

Table 6 Project outcome of SDG6

Date	Number of premises type p with at least one project technology	Number of individuals per premises type	Usage rate of the project technology by premises
	$N_{p,y}$ (number)	$HN_{p,y}$	$U_{p,y}$
09/10/2020-31/10/2020	215,237	3.94	89%
01/11/2020-30/11/2020	467,123	3.94	89%
01/12/2020-31/12/2020	467,123	3.94	89%
01/01/2021-31/01/2021	467,123	3.94	89%
01/02/2021-28/02/2021	467,123	3.94	89%
01/03/2021-31/03/2021	467,123	3.94	89%
01/04/2021-30/04/2021	467,123	3.94	89%
01/05/2021-31/05/2021	467,123	3.94	89%
01/06/2021-30/06/2021	467,123	3.94	89%
01/07/2021-31/07/2021	467,123	3.94	89%

Date	Days the project technology is present for end-users	Modifier for the water quality	Total number of person.days served with satisfactory level of safe water
	$DP_{p,y}$ (days)	$M_{q,y}$	Project outcome of SDG6
10/10/2020-31/10/2020	10	100%	7,547,500
01/11/2020-30/11/2020	21	100%	34,398,283
01/12/2020-31/12/2020	31	100%	50,778,418
01/01/2021-31/01/2021	31	100%	50,778,418
01/02/2021-28/02/2021	28	100%	45,864,378
01/03/2021-31/03/2021	31	100%	50,778,418
01/04/2021-30/04/2021	30	100%	49,140,405
01/05/2021-31/05/2021	31	100%	50,778,418
01/06/2021-30/06/2021	30	100%	49,140,405
01/07/2021-31/07/2021	31	100%	50,778,418

Above all, from 10/10/2020 to 31/12/2020, the total number of person.days served with satisfactory level of safe water is 92,724,201. Form 01/01/2021 to 31/07/2021, the total number of person.days served with satisfactory level of safe water is 347,258,860.

For the 1st monitoring period from 10/10/2020 to 31/07/2021, the total number of person.days served with satisfactory level of safe water is 439,983,061.

SDG 7 Affordable and Clean Energy

The number of water purifiers sold will be based on the sales database and cross checked by the purchase receipts. In this monitoring period, the sold of Multi-Layer water purifiers started on 09/10/2020³² and sales plan for the first year was completed within two months and the total number of water purifier sold by the project owner is 467,123.

According to the monitoring results, in year 2020, the number of water purifiers sold is 467,123. From 01/01/2021 to 31/07/2021, the number of water purifiers sold is 0. So, the actual number of water purifiers sold engaged in the 1st monitoring period was 467,123.

SDG 8 Decent Work and Economic Growth Project Impact

From 10/10/2020 to 31/12/2020, 12 jobs for local people created (including 6 females and 6 males), the percentage of employees with salaries paid at par with the average wage of Kenya is 100%.

From 01/01/2021 to 31/07/2021, 12 jobs for local people created (including 6 females and 6 males), the percentage of employees with salaries paid at par with the average wage of Kenya is 100%.

For the 1st monitoring period from 10/10/2020 to 31/07/2021, 12 jobs for local people created (including 6 females and 6 males), the percentage of employees with salaries paid at par with the average wage of Kenya is 100%.

SDG 13 Climate Action Project Impact

As the section B.6.2 in PDD, the Multi-Layer water purifiers introduced by the project require no energy input or consumables, which will offer an affordable, long-term and zero emission solution for households that generally consume unsafe drinking water. No fossil fuel or electricity will be used in the project activity, project emissions (PE_y) is 0 tCO₂e.

E.3. Calculation of leakage

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As per section 3.8 of the applied GS methodology and the section B.6.1 in PDD of this project. The leakage emission is 5% of the total emission reductions, i.e., the leakage emission = 5%*total emission reductions=5%*(Baseline emission-leakage emission), so the leakage

³² In the calculation of emission reductions, based on the conservative considerations, it is believed that the water purifiers sold on the same day will start to be used in the next day, so the crediting period start date is 10/10/2020, which is one day behind the project start date. Thus, the water purifier sold on 09/10/2020 has been taken into the calculation of emission reductions. So the result of SDG7 should be the number of water purifier sold from 09/10/2020.

emission=5%*Baseline emission/ (1+5%). The calculation result of leakage emissions is shown in the table below:

Table 7 the calculation result of leakage emission

Date	Baseline Emission (tCO ₂ e)	Leakage Emission (tCO ₂ e)
10/10/2020-31/10/2020	5,139	245
01/11/2020-30/11/2020	23,191	1,105
01/12/2020-31/12/2020	34,237	1,631
01/01/2021-31/01/2021	34,237	1,631
01/02/2021-28/02/2021	30,923	1,473
01/03/2021-31/03/2021	34,237	1,631
01/04/2021-30/04/2021	33,133	1,578
01/05/2021-31/05/2021	34,237	1,631
01/06/2021-30/06/2021	33,133	1,578
01/07/2021-31/07/2021	34,237	1,631
Total	296,704	14,134

E.4. Calculation of net benefits or direct calculation for each SDG Impact

SDG	SDG Impact	Baseline impact	Project impact	Leakage emission	Net benefit
13	Emission Reductions	10/10/2020-31/12/2020: 62,567 tCO ₂ e emission	10/10/2020-31/12/2020: 0 tCO ₂ e emission	10/10/2020-31/12/2020: 2,981 tCO ₂ e emission	10/10/2020-31/12/2020: 59,586 tCO ₂ e emission reduction
		01/01/2021-31/07/2021: 234,137 tCO ₂ e emission	01/01/2021-31/07/2021: 0 tCO ₂ e emission	01/01/2021-31/07/2021: 11,153 tCO ₂ e emission	01/01/2021-31/07/2021: 222,984 tCO ₂ e emission reduction
		Total: 296,704 tCO ₂ e emission	Total: 0 tCO ₂ e emission	Total: 14,134 tCO ₂ e emission	Total: 282,570 tCO ₂ e emission reduction
6	Total number of person.days served with satisfactory level of safe water.	10/10/2020-31/12/2020: 0	10/10/2020-31/12/2020: 92,724,201		10/10/2020-31/12/2020: 92,724,201
		01/01/2021-31/07/2021: 0	01/01/2021-31/07/2021: 347,258,860		01/01/2021-31/07/2021: 347,258,860

		1 st monitoring period from 10/10/2020 to 31/07/2021: 0	1 st monitoring period from 10/10/2020 to 31/07/2021: 439,983,061	1 st monitoring period from 10/10/2020 to 31/07/2021: 439,983,061
7	The Number of water purifiers sold	09/10/2020- 31/12/2020:0	09/10/2020- 31/12/2020:467,123	09/10/2020- 31/12/2020:467,123
		01/01/2021- 31/07/2021: 0	01/01/2021- 31/07/2021: 0	01/01/2021- 31/07/2021: 0
		1 st monitoring period: 0	1 st monitoring period: 467,123	1 st monitoring period 1: 467,123
8	1) Number of males and females employed by the project.	10/10/2020- 31/12/2020:0	10/10/2020- 31/12/2020: 12 jobs created (including 6 females and 6 males).	10/10/2020- 31/12/2020: 12 jobs created (including 6 females and 6 males).
		01/01/2021- 31/07/2021: 0	01/01/2021- 31/07/2021: 12 jobs created (including 6 females and 6 males).	01/01/2021- 31/07/2021: 12 jobs created (including 6 females and 6 males).
		1 st monitoring period from 10/10/2020 to 31/07/2021: 0	1 st monitoring period from 10/10/2020 to 31/07/2021: 12 jobs created (including 6 females and 6 males).	1 st monitoring period from 10/10/2020 to 31/07/2021: 12 jobs created (including 6 females and 6 males).
	2) Percentage of employees with salaries paid at par with the average wage of Kenya.	10/10/2020- 31/12/2020:0	10/10/2020- 31/12/2020:100%	10/10/2020- 31/12/2020:100%
		01/01/2021- 31/07/2021: 0	01/01/2021- 31/07/2021: 100%	01/01/2021- 31/07/2021: 100%
		1 st monitoring period from 10/10/2020 to 31/07/2021: 0	1 st monitoring period from 10/10/2020 to 31/07/2021: 100%	1 st monitoring period from 10/10/2020 to 31/07/2021: 100%

E.5. Comparison of actual SDG Impacts with estimates in approved PDD

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values ³³ achieved during this monitoring period
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³³ Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

13	10/10/2020-31/12/2020: 104,520 ³⁴ tCO ₂ e	10/10/2020-31/12/2020: 59,586 tCO ₂ e
	01/01/2021-31/07/2021: 266,967 ³⁵ tCO ₂ e	01/01/2021-31/07/2021: 222,984tCO ₂ e
	Total: 371,487 tCO ₂ e ³⁶	Total: 282,570 tCO ₂ e
6	10/10/2020-31/12/2020: Total number of person.days served with satisfactory level of safe water is 157,563,147 ³⁷ .	10/10/2020-31/12/2020: Total number of person.days served with satisfactory level of safe water is 92,724,201.
	01/01/2021-31/07/2021: Total number of person.days served with satisfactory level of safe water is 402,450,449 ³⁸	01/01/2021-31/07/2021: Total number of person.days served with satisfactory level of safe water is 347,258,860.
	1 st monitoring period from 10/10/2020 to 31/07/2021: Total number of person.days served with satisfactory level of safe water is 560,013,596	1 st monitoring period from 10/10/2020 to 31/07/2021: Total number of person.days served with satisfactory level of safe water is 439,983,061.
7	09/10/2020-31/12/2020: The Number of water purifiers sold is: 110,465 ³⁹	09/10/2020-31/12/2020: The Number of water purifiers sold is:467,123
	01/01/2021-31/07/2021: The Number of water purifiers sold is:278,794 ⁴⁰	01/01/2021-31/07/2021: The Number of water purifiers sold is: 0
	1 st monitoring period from 09/10/2020 to 31/07/2021: 389,259 water purifiers sold.	1 st monitoring period from 09/10/2020 to 31/07/2021: 467,123 water purifiers sold
8	10/10/2020-31/12/2020: 12 jobs for local people created (6 females and 6 males). Percentage of employees with salaries paid at par with the average wage of Kenya:100%.	10/10/2020-31/12/2020: 12 jobs for local people created (6 females and 6 males). Percentage of employees with salaries paid at par with the average wage of Kenya:100%.
	01/01/2021-31/07/2021: 12 jobs for local people created (6 females and 6 males). Percentage of employees with salaries paid at par with the average wage of Kenya:100%.	01/01/2021-31/07/2021: 12 jobs for local people created (6 females and 6 males). Percentage of employees with salaries paid at par with the average wage of Kenya:100%.
	1 st monitoring period from 10/10/2020 to 31/07/2021: 12 jobs for local people created (6 females and 6 males). Percentage of employees with salaries paid at par with the average wage of Kenya:100%.	1 st monitoring period from 10/10/2020 to 31/07/2021: 12 jobs for local people created (6 females and 6 males). Percentage of employees with salaries paid at par with the average wage of Kenya:100%.

E.5.1. Explanation of calculation of value estimated ex ante calculation of approved PDD for this monitoring period

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The estimated outcomes of SDG 7 are 389,259 water purified sold in PDD. The calculation of value estimated of SDG 7 is according to the business plan. The estimated outcomes of SDG 6 are 560,013,596 person.days served with satisfactory level of safe water is in PDD. The

³⁴ Yearly total amount estimated emission reduction in PDD is 459,638 tCO₂e, so the values estimated emission reduction from 10/10/2020-31/12/2020 is 459,638 tCO₂e/365d*83 d=104,520 tCO₂e.

³⁵ Yearly total amount estimated emission reduction in PDD is 459,638 tCO₂e, so the values estimated emission reduction from 01/01/2021-31/07/2021 is 459,638 tCO₂e/365d*212 d=266,967 tCO₂e.

³⁶ The values estimated emission reduction from 10/10/2020-31/07/2021 is 104,520 tCO₂e +266,967 tCO₂e =371,487 tCO₂e

³⁷ According to PDD, the Yearly total number of person.days served with satisfactory level of safe water in first year is 692,898,179. So the number of person.days served with satisfactory level of safe water in 10/10/2020-31/12/2020 is 692,898,179/365*83=157,563,147.

³⁸ According to PDD, the yearly total number of person.days served with satisfactory level of safe water in first year is 692,898,179. So the number of person.days served with satisfactory level of safe water in 01/01/2021-31/07/2021 is 692,898,179/365*212=402,450,449.

³⁹ According to PDD, the number of first year sold is 480,000. So, the number of water purifier sold in 09/10/2020-31/12/2020 is 480,000/365*84=110,465 sets.

⁴⁰ According to PDD, the number of first year sold is 480,000. So, the number of water purifier sold in 01/01/2021-31/07/2021 is 480,000/365*212=278,794 sets.

calculation of value estimated of SDG6 in PDD is obtained by using the following formula: Project outcome of SDG 6= $N_{p,y} \cdot HN_{p,y} \cdot DP_{p,y} \cdot U_{p,y} \cdot M_{q,y}$

Where,

Parameters	Description	Source/Value
$N_{p,y}$	Number of premises type p with at least one project technology in year y	Sales database
$HN_{p,y}$	Number of individuals per premises type p in year y	Project survey, for ex ante estimation, result of 3.9 from baseline survey shall be used.
$DP_{p,y}$	Days the project technology is present for end-users in the premises p in year y	To be monitored, for ex ante estimation, $D_{p,y}=365$
$U_{p,y}$	Usage rate of the project technology by premises type p during year y .	To be monitored, for ex ante estimation, $U_{p,y}=80\%$
$M_{q,y}$	Ongoing water quality indicated as the fraction of the samples that pass microbial quality standard requirements specified in relevant microbial quality standard for drinking water of Kenya.	Water quality test, for ex ante estimation, $M_{q,y}=100\%$ based on the manufacturer's specifications of the project technologies

The estimated value of the outcomes of SDG 13 for the first monitoring period is 371,487⁴¹ tCO₂e, in PDD and the calculation method is based on methodology" Methodology for Emission Reductions from Safe Drinking Water Supply (Version 1.0)". The actual value of SDG13 in this monitoring periods is also calculated based on methodology" Methodology for Emission Reductions from Safe Drinking Water Supply (Version 1.0)", The methods of calculation are the same. The mainly difference between the estimated value and actual values is mainly due to the changes of the number of water purifier sold ($N_{p,y}$), the Days the project technology is present($DP_{p,y}$), usage rate ($U_{p,y}$), Proportion of project households that boil safe water($X_{clean,boil,y}$), the Modifier for the water quality($M_{q,y}$)and the Quantity of safe drinking water provided by the project(Q_y).

The estimated outcomes of SDG 8 are 12 jobs created (6 females and 6 males) and the Percentage of employees with salaries paid at par with the average wage of Kenya is 100% in PDD. It can be obtained from the employment records and labor contracts. The actual outcomes of SDG 8 are 12 jobs created (6 females and 6 males) and the Percentage of employees with

⁴¹ Yearly total amount estimated emission reduction in PDD is 459,638 tCO₂e, so the values estimated emission reduction from 10/10/2020-31/12/2020 is 459,638 tCO₂e/365d*83d=104,520 tCO₂e. The values estimated emission reduction from 01/01/2021-31/07/2021 is 459,638 tCO₂e/365d*212d=266,967tCO₂e. so, the values estimated emission reduction from 10/10/2020-31/07/2021 is 104,520 tCO₂e +266,967 tCO₂e =371,487 tCO₂e.

salaries paid at par with the average wage of Kenya is 100%. It can also be obtained from employment records and labor contracts.

E.6. Remarks on increase in achieved SDG Impacts from estimated value in approved PDD

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The estimated value of the outcomes of SDG 6 for the first monitoring period is 560,013,596 person.days served with satisfactory level of safe water and the actual value is 439,983,061 person.days served with satisfactory level of safe water, which is about 78.56% of the estimated value. That's because the number of water purifier sold ($N_{p,y}$), the Days the project technology is present ($DP_{p,y}$) and usage rate ($U_{p,y}$) will fluctuate according to the actual situation. The difference from the estimated value mainly due to the changes of the related three variables.

The outcomes of SDG7 are higher than the estimated value in the PDD. The estimated outcomes of SDG 7 are 389,259 water purifiers sold in this monitoring period in PDD and the actual value is higher 20% of the estimated value. That's because the water purifier involved in this project have a good quality, lower sales price and the project owner is responsible for maintenance and replacement of all parts, no additional costs will be incurred for the user's normal use. Therefore, our water purifier is more popular, and the sales plan for the first year was completed within two months. After all, the water purifiers involved in this project are imported products from foreign countries. Since this project is the first time for the project owner to implement in project area and in order to explore the acceptability of the local market and local people for the products, only 467,123 water purifiers can be sold in this batch which can be meet the sales plan of the first year. It can be seen from the first batch of sales, the number of water purifiers sold is objective and welcomed by the local people. Therefore, the project owner will continue to sell water purifiers in the project area, but it takes time to carry out a series of commodity procurement, import and export inspection and other processes.

The estimated outcomes of SDG 8 are consistent with the actual value in this monitoring period, both are 12 jobs created (6 females and 6 males) and the Percentage of employees with salaries paid at par with the average wage of Kenya is 100%.

The estimated value of the outcomes of SDG 13 for the first monitoring period is 371,487 tCO_{2e}, and the actual value is 282,570 tCO_{2e}, which is about 76.06% of the estimated value. That's because the number of water purifier sold ($N_{p,y}$), the Days the project technology is present ($DP_{p,y}$) and usage rate ($U_{p,y}$) will fluctuate according to the actual situation. The difference from the estimated value mainly due to the changes of the related three variables.

SECTION F. SAFEGUARDS REPORTING

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According to the Section D.1 and Appendix 1 in PDD, there are two Safeguarding principles to be monitored, i.e., principles 3 and principles 7.1.

For Safeguarding principles 3, the Mitigation Measures added to the Monitoring Plan are: The project is expected to have a positive effect on community health and safety. As a mitigation measure, the parameter of Water Hygiene education campaigns, Ongoing water quality indicated as the fraction of the samples that pass the test of bacterial quality to a standard of <1cfu/100ml ($M_{q,y}$) will be monitored during the crediting period. so, the monitoring parameter are Water Hygiene education campaigns and the water quality. Please refer to Section C and Section D.2 in this monitoring report for the specific monitoring of water quality and Water Hygiene education campaigns.

The monitoring of those parameters was fully implemented in accordance with the monitoring plan in PDD and the monitoring activities was successful, so there is no need to update the mitigation measures.

For Safeguarding principles 3, the monitoring parameter is the water quality filtered by the water purifier and Water Hygiene education campaigns. From the Water Hygiene education campaigns questionnaires, there is no deviation from the pre-set tolerances. From the water quality test report, the fraction of the samples that pass the test of bacterial quality to a standard of <1cfu/100ml ($M_{q,y}$) is 100% and there is no deviation from the pre-set tolerances(100%).

For Safeguarding principles 7.1, the Mitigation Measures added to the Monitoring Plan are: Leakage emissions in project scenario were assessed and will be re-assessed every two years. So, the monitoring parameter are Leakage emissions. Please refer to Section B.6 of PDD and Section D.2 in this monitoring report for the specific monitoring of Leakage emissions.

As the Leakage emissions in project scenario Need to be evaluated every two years. So, in this monitoring period, there is no need to re-assess. As applied methodology, If the ex-ante evaluation shows that leakage emissions are less than 5% of total emission reductions, then no monitoring is needed, and emission reductions simply shall be adjusted 5% down. In the PDD, the leakage emissions are less than 5% of total emission reductions, so, the leakage emissions in this monitoring period are 5% of the total emission reduction.

The monitoring of those parameters was fully implemented in accordance with the monitoring plan in PDD and the monitoring activities was successful, so there is no need to update the mitigation measures.

In addition, in this monitoring periods, there is no Information on any assessment questions answered 'Potentially'.

SECTION G. STAKEHOLDER INPUTS AND LEGAL DISPUTES

G.1. List all Inputs and Grievances which have been received via the Continuous Input and Grievance Mechanism together with their respective responses/mitigations.

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Method	Include all details of Chosen Method (s) so that they may be understood and, where relevant, used by readers.
Continuous Input / Grievance Expression Process Book (mandatory)	The grievance expression book is kept by the chief officer Environment, Energy & Natural Resources of Makueni County, Trans Nzoia County, Kirinyaga County, Bungoma County and Nakuru County. All stakeholders are allowed to record their grievances or comments in the Expression Process book. The project owner will assign specific person in each sub county to deal with related issues. When assessing the relevance and appropriateness of the stakeholders' comments, the project owner will apply a gender lens.
GS Contact (mandatory)	help@goldstandard.org
Other	Feedback can be made directly through visiting Climate Neutral Kenya Limited or through e-mail mosesatempa8810@gmail.com
No inputs/grievances received during the monitoring period through all the methods.	

G.2. Report on any stakeholder mitigations that were agreed to be monitored.

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This is the 1st monitoring period due to which there is no input/grievance to follow up action so there is no need to re-assessment the Safeguarding principles.

G.3. Provide details of any legal contest that has arisen with the project during the monitoring period

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No legal contest or dispute has been arisen with the project during the monitoring period.

Revision History

Version	Date	Remarks
1.1	14 October 2020	<p>Hyperlinked section summary to enable quick access to key sections</p> <p>Improved clarity on Key Project Information</p> <p>Section for POA monitoring</p> <p>Forward action request section</p> <p>Improved Clarity on SDG contribution/SDG Impact term used throughout</p> <p>Clarity on safeguard reporting</p> <p>Clarity on design changes</p> <p>Leakage section added for VER/CER projects</p> <p>Addition of Comparison of monitored parameters with last monitoring period</p> <p>Provision of an accompanying Guide to help the user understand detailed rules and requirements</p>
1.0	10 July 2017	Initial adoption