Gold Standard for the Global Goals

Climate Security & Sustainable Development

KEY PROJECT INFORMATION & VPA DESIGN DOCUMENT (PDD)

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VERSION **v. 1.1**

RELATED SUPPORT

– **TEMPLATE GUIDE Key Project Information & VPA Design Document v.1.1**

This document contains the following Sections

Key Project Information

KEY PROJECT INFORMATION

GS ID of Project	GS10987
Title of Project	GivePower Kenya Solar Water Farms
Time of First Submission Date	08/02/2021
Date of Design Certification	N/A
Version number of the VPA-DD	9
Completion date of version	15/09/2021
Coordinating/managing entity	CO2balance UK Ltd
VPA Implementer (s)	CO2balance UK Ltd GivePower Foundation
Project Participants and any communities involved	CO2balance UK Ltd
Host Country (ies)	The Republic of Kenya
GS ID and Title of applicable Design Certified VPA	N/A
GS ID and Title of applicable Performance Certified VPA	N/A
Activity Requirements applied	☒ Community Services Activities ☐ Renewable Energy Activities ☐ Land Use and Forestry Activities/Risks & Capacities ☐ N/A
Scale of the project activity	☐ Micro scale ☒ Small Scale ☐ Large Scale
Other Requirements applied	N/A
Methodology (ies) applied and version number	TPDDTEC version 3.1.
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A
Project Cycle:	☐ Regular ☒ Retroactive

Table 1 – Estimated Sustainable Development Contributions

Sustainable Development Goals Targeted	SDG Impact (defined in B.6.)	Estimated Annual Average	Units or Products
3 Good Health and Well-being	Number of additional persons having access to safe water in the project activity compared to the baseline scenario	62,775	Additional people consuming safe water
5 Gender Equality	Total reduction time spent collecting firewood for project activity in year y (hours)	0.5	Hours
6 Clean Water and Sanitation	Number of additional persons having access to safe water in the project activity compared to the baseline scenario	75,330	Additional people with access to safe water
13 Climate Action (mandatory)	Emissions Reductions	60,000	VERs

SECTION A. DESCRIPTION OF PROJECT

A.1. Purpose and general description of project

The Small-Scale VPA GivePower Foundation Kenya Solar Water Farms project is eligible under the Gold Standard methodology Technologies and Practices to Displace Decentralized Thermal Energy Consumption Version 3.1. The project will support the provision of safe water using photovoltaic cells to power desalination technology to thousands of households in coastal Kenya. By providing safe water, the project will ensure that households consume less firewood and charcoal during the process of water purification and as a result there shall be a reduction of carbon dioxide emissions from the combustion process.

The project will aim to reach peri-urban to rural communities on the coast of Kenya. People's fuel use is typically related to their income and location with a typical mix between using wood fuel and charcoal on inefficient three stone fires and inefficient traditional charcoal stoves to purify drinking, cleaning and washing water. This process results in the release of greenhouse gas emissions from the combustion of fuels – this can be avoided if a technology that does not require fuel (wood or fossil) supplies clean water desired by households.

The communities involved in the project will all be low to middle income in areas with salty groundwater across coastal Kenya. Water access varies by community and income level, with a large market for unpotable water. This results in communities collecting water from unsafe sources such as rivers, streams, lakes, unprotected springs and open wells. The completion of the baseline study, before validation, will result in a more accurate understanding of baseline characteristics.

The number of desalination plants per VPA will be limited by the amount of pure water supplied by each unit; based on ex ante calculations, the maximum number of desalination plants that can be installed in one VPA to achieve 60,000 tCO2e is approximately 9 MAXI model solar desalination plants, given the baseline fuel use mix identified by the baseline study. However, the exact number will be determined once actual project survey data has been collected. GivePower Foundation will install the solar desalination plants and deliver the maintenance programme for all the desalination plants included in the project activity to ensure that the quality of the

water delivered by the plants is fit for human consumption for the entire length of the project, which will be a minimum of 5 years.

GivePower Foundation have provided all upfront funding for the plants. Income generated by the sale of carbon credits will ensure ongoing maintenance and operation of the technologies while setting water prices at the necessary price point for local communities to benefit. GivePower Foundation have agreed to transfer the emissions reductions over to CO2balance UK Ltd (CO2balance). This project will be developed under the Gold Standard Foundation, which in addition to checking that the carbon credits from this project are real, also measures local social, environmental, and economic impact.

A.1.1. Eligibility of the project under approved PoA

The project is eligible under section 3.1.1 of the GS4GG Principles and Requirements as it follows an established Gold Standard methodology. Concerning point 3.1.1.5, the project does not support geoengineering or entail energy production from fossil fuels or nuclear. Rather it supports a switch away from polluting technologies to an emissions-free means of accessing safe water.

The project is eligible under the Gold Standard Methodology: Technologies and Practices to Displace Decentralized Thermal Energy Consumption Version 3.1. By providing safe water through the installation of solar desalination plants, the project will ensure that households consume less wood and fossil fuels by displacing the need to boil water for purification. This will result in a reduction of carbon dioxide emissions.

Further details on eligibility are provided in the table below:

No.	Eligibility Criterion	Description/ Required condition	Means of Verification/Supporting evidence for inclusion
1	Types of Project	Eligible Projects shall include physical action/implementation on the ground. Pre-identified eligible Project types are identified in the Eligibility	The project involves the installation of safe water sources. The project type is eligible under Community Services

		Principles and Requirements section.	Activity Requirements s.3.1.1(b) and s.3.1.1(d).
2	Location of Project	Projects may be located in any part of the world.	The host country and location of this VPA is specified in Section A.2, in line with the locations outlined in Section A.3 of the POA-DD.
3	Project Area, Project Boundary and Scale	The Project Area and Project Boundary shall be defined. Projects may be developed at any scale although certain rules, requirements and limitations may apply under specific Activity Requirements, Impact Quantification Methodologies and Products Requirements. In order to avoid double counting the Project shall not be included in any other voluntary or compliance standards programme unless approved by Gold Standard (for example through dual certification). Also, if the Project Area overlaps with that of another Gold Standard or other voluntary or compliance standard programme of a similar nature, the project shall demonstrate that there is no double counting of impacts at design and performance certification (for example use of similar technology or practices through which the potential arises for double counting or misestimation of impacts amongst projects).	The project boundary, including GPS co-ordinates and maps are included in Section A.2. This VPA is not included by any other carbon standard and will be capped at the type (iii) projects small-scale threshold of 60,000 ERs per year.
4	Host Country Requirements	Projects shall be in compliance with applicable	VPA is in compliance with Host Country requirements

		Host Country's legal, environmental, ecological and social regulations.	such as the Energy Act[1] and the Environmental Management and Co-ordination Act[2].
5	Contact Details	As part of the Project Documentation the Project Developer shall provide (i) name and (ii) contact details of all Project Participants; AND in case of an organisation (iii) the legal registration details and (iv) documentation by the governing jurisdiction that proves that the entity is in good standing (defined as being a legal or other appropriate entity registered in or allowed to operate within the required jurisdiction and with no evidence of insolvency or legal/criminal notices placed against it or any of its Directors). Gold Standard retains the right (at its own discretion) to refuse use of the Standard where reputational concerns are highlighted.	Contact details of the Project Developer are included in Appendix 2.
6	Legal Ownership	Full and uncontested legal ownership of any Products that are generated under Gold Standard Certification, (for example carbon credits) shall be demonstrated. Where such ownership is transferred from project beneficiaries this must be demonstrated	At the point of technology installation, a Carbon Transfer Form (CTF) will be signed and uploaded to our database stating that the rights to the carbon credits will lie with GivePower Foundation. The plant manager from each installed desalination

[1] Kenya's Energy Act, 2019 – available at: http://kenyalaw.org:8181/exist/kenyalex/actview.xql?actid=No.%201%20of%202019

[2] Kenya's Environmental Management and Co-ordination Act, 1999 – available at: http://kenyalaw.org:8181/exist/kenyalex/actview.xql?actid=No.%208%20of%201999

		transparently and with full, prior and informed consent (FPIC). Note that for certain Project types there is a requirement for full and uncontested legal land title/tenure to be demonstrated. These are contained within specific Activity or Product Requirements. All projects shall immediately report to Gold Standard any land title/tenure disputes arising.	plant will sign a CTF on behalf of all users thereof.
7	Other Rights	As well as legal title and ownership, the Project Developer shall also demonstrate where required uncontested legal rights and/or permissions concerning changes in use of other resources required to service the Project (for example, access rights, water rights etc.). Any known disputes or contested rights must be declared immediately to Gold Standard by the Project Developer and resolved prior to further Project implementation in affected areas.	There are no disputes or contested rights that have been identified in relation to rights relevant to the project activity.
8	Official Development Assistance (ODA) Declaration	All Project Developers applying for project activities located in a country named by the OECD Development Assistance Committee's ODA recipient list and seeking Gold Standard Certification for carbon credits shall declare the Official Development Assistance (ODA) support. The Project Developer shall follow the GHG Emissions Reduction & Sequestration Product Requirements and submit the declaration at the time	A declaration confirming that there is no diversion of ODA has been submitted.

		of Design Certification.	
9	Fraction of Non-Renewable Biomass	Reference from where fNRB shall be calculated for VPAs shall be included in the eligibility criteria to avoid confusion at the time of VPA inclusion and for consistency	fNRB has been calculated in accordance with CDM Tool 30[3].
10	Test for Wb,y parameter	The test for fixed parameter Wb,y is based on the water boiling test.	The VPA has applied the default Wb,y values for wood and charcoal of 0.4 kg/litre and 0.1 kg/litre, respectively.
11	Water Project Treatment Capacity	The treatment capacity limits of project technology/source are required to be monitored to ensure that the water consumption level applied for emission reductions must not be greater than the treatment capacity of the project technology/sources.	The VPA actively monitors quantity of water produced/sold.
12	Cookstove Project Theoretical Savings	The theoretical wood savings from a cook stove project shall be estimated based on following- Py = Bb,y * (1-hb/hp,y) Py - quantity of firewood consumed in project Bb,y - quantity of firewood consumed in baseline hb – efficiency of baseline technology hp,y – efficiency of project technology	Does not apply to this VPA.
13	Double Counting	Conditions to confirm that VPAs are neither registered as CDM project activities, included in another registered PoAs,	The VPA is not registered elsewhere. Each technology is assigned a unique ID along with GPS coordinates of the project

[3] Calculation of the fraction of non-renewable biomass version 03.0
Available at: https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-30-v3.0.pdf

		nor the project activities that have been deregistered.	boundary being supplied.
14	Technical Specification	Specification of the technology/measure, such as the level and type of service, as well as performance specification based on, inter alia, testing/certification.	Technical Specifications are provided in Section A.3 of the VPA-DD.
15	Start Dates	Conditions to check the start dates of VPAs through documentary evidence.	Start date is confirmed by carbon transfer form.
16	Applicability	Conditions to ensure compliance with the applicability of the applied methodologies, the applied standardized baselines and the other applied methodological regulatory documents.	Set out in Section B.2 of the VPA-DD.
17	Additionality	Conditions to ensure that VPAs meet the requirements for demonstration of additionality.	Set out in Section B.5 of the VPA-DD.
18	LSC and EIA	Conditions related to undertaking local stakeholder consultation and environmental impact analysis.	LSC is postponed due to Covid-19. Interim measures are set to expire on 31/12/2021[4].
19	Target Group	Target group (e.g. domestic/commercial/industrial, rural/urban, grid-connected/offgrid), and where applicable, distribution mechanisms (e.g. direct installation).	Target Group: Domestic in rural/peri-urban locations. Distribution Mechanism: Centralised Site.
20	Sampling	Sampling approaches are set out in each VPA and will follow the TPDDTEC v3.1 methodology.	Set out in Section B.7.2 of the VPA-DD.
21	Crediting Period	All VPAs submitted for	Set out in Section C of the

[4] https://globalgoals.goldstandard.org/ru-2021-covid-19-interim-measures-update/

	inclusion after the first crediting cycle of such PoA and completion of transition to GS4GG shall follow the GS4GG Certification Cycle (i.e. 5 years renewals.	VPA-DD.

The project follows the Community Services Activity Requirements, the following table demonstrates how it meets criteria in section 2 Eligible Project Types and section 3 General Eligibility Criteria.

No.	Requirements relevant to this VPA	Demonstration of meeting requirements
2	**Eligibility Project Types**	
2.1.1	Projects shall lead to climate change mitigation and/or adaption by providing or improving access to services/resources at household or community or institution level. Eligible services include electricity and energy, water and sanitation, waste management, housing, etc.	By providing a safe water source the safe water project will improve access to safe water services/resources at community level. As such, the project is Eligible Project Types in line with the requirements.
2.1.3	In relation to the above all Projects shall therefore confirm to Gold Standard for the Global Goals Principles & Requirements (and associated documents)	The project conforms with GS4GG Principles and Requirements.
3	**General Eligibility Criteria**	
3.1.1	**Types of Project** b) End-Use Energy Efficiency: Project activities that reduce energy requirements as compared to baseline scenario without affecting the level and quality of services or products where the end user of the products and services are clearly identified and when the physical intervention is required at the user end.	By providing safe water, the project activity reduces the energy requirements compared to the baseline scenario by ensuring that households consume less firewood through no longer needing to purify their water.
3.1.2	**Project Area, boundary and scale** Project Area and Boundary shall be defined in line with the applicable Methodologies or Product Requirements. The definition of small-scale is a project issuing emission reductions less than or equal to the maximum savings equivalent of 60GWh per year.	The project Area and Boundary are defined in line with the applicable Methodology, outlined in Section A.2. The project is a Small-scale project issuing emission reductions which will be capped at 60,000 ERs per year.
3.1.3	**Suppressed Demand baseline** Certain Impact Quantification methodologies allow projects to account Suppressed Demand scenario when establishing a baseline. In such cases, the application of Supressed Demand baseline is limited to Small-Scale and Microscale Projects. Where a Suppressed Demand baseline is applied, it is not possible to 'stack' Gold	The VPA is a Small-Scale project, therefore it is eligible to allow for suppressed demand in the baseline scenario. The baseline scenario is assessed in terms of suppressed demand. Supressed demand is determined through a set of questions in the Baseline Survey that establish the method that households use to purify their

Standard Certified Impact Statements or Products as the definition of the baseline may be contradictory.	water, if any, and how they would choose to purify if they were not subject to monetary and access barriers. A fixed suppressed demand baseline has been opted for. However, in the event the project surveys show a substantial change in fuel use characteristics, a new baseline shall be conducted. No Gold Standard Certified Impact Statements or Products are intended to be stacked in case of a suppressed demand baseline.
3.1.4 **Legal Ownership** a) Projects involving the distribution of a large number of devices for services shall provide a clear description of the ownership of the Products that are generated under Gold Standard Certification all along the investment chain. In line with FPIC requirement, the proofs that end-users are aware of and willing to give up their rights on Products shall be provided. b) The transfer for Product ownership shall be discussed during the local stakeholder consultations for projects.	a) It will be clearly communicated that CO2balance UK Ltd is the Co-ordinating/Managing Entity which communicates with the Gold Standard and that GivePower Foundation are the entity that is claiming ownership rights of the emission reductions resulting from the project activity. It will also be communicated that CO2balance are responsible for selling and marketing the emission reductions resulting from the project activity. The project is managed in the host country by CO2balance in-country staff and GivePower Foundation solar desalination plant staff. GivePower Foundation have legal ownership of the carbon credits produced as a result of the project. At the point of technology installation, a Carbon Transfer Form (CTF) will be signed and uploaded to our database stating that the rights to the carbon credits will lie with GivePower Foundation. The Plant Operator for each installed solar desalination plant will sign a CTF on behalf of all users thereof. b) The transfer of ownership shall be discussed during the local stakeholder consultation conducted by CO2balance UK Ltd, presenting the details of the project to the local community members, officials and Community Leaders who attend.

A.1.2. Legal ownership of products generated by the project and legal rights to alter use of resources required to service the project

CO2balance is the Co-ordinating/Managing Entity which communicates with the Gold Standard, and the project is managed in the Host Country by GivePower Foundation. GivePower Foundation have legal ownership of the carbon credits produced as result of the project. Both parties maintain the right to operate the projects in the host country, the Republic of Kenya. Solar Desalination Plants are managed by local GivePower Foundation employees, with plant managers in place at each solar desalination plant. Local communities are recognised as the main users of the desalination plants in the project. The project will ensure that it complies with the host countries' legal, environmental, ecological and social regulations. There are no disputes or contested rights that have been identified in relation to rights relevant to the project activity.

At the point of technology installation/repair, a Carbon Transfer Form (CTF) will be signed and uploaded to our database stating that the rights to the carbon credits will lie with GivePower Foundation. The site manager of each project technology will sign a CTF on behalf of all users thereof.

A.2. Location of project

Below are details of the physical location to allow unique identification of the project. The project boundary lies in the coastal region of Kenya, within which solar desalination plants could be installed. This project boundary is clearly indicated below. The target area and the fuel collection area are defined as being contained within the project boundary, with the outer limits of the project boundary being clearly defined below. As the majority of beneficiaries that collect or buy their wood fuel and charcoal do so locally, the wood fuel collection area and charcoal collection area and target area are considered the same.

To avoid double-counting, GPS coordinates for each desalination plant will be provided, recording their location, by first verification. In addition, the physical address of each solar desalination plant will be provided. This will include the host party, county, ward, city/town/community, and street name and number, if applicable.

Currently, there is one solar desalination plant in operation. The below is an example of the location data collected, all information is available on the carbon transfer form completed at installation:

Host Party	County	Ward	City/Town/Community	Street name and Number	Unique ID
GiveWater Limited	Mombasa County	Timboni	Likoni	N/A	MSA/MS/1/240

Each desalination plant will be given a unique name and details of plant managers will be recorded in CO2balance's database to ensure ease of contact. This will act as a further mechanism to verify the unique identification of each plant.

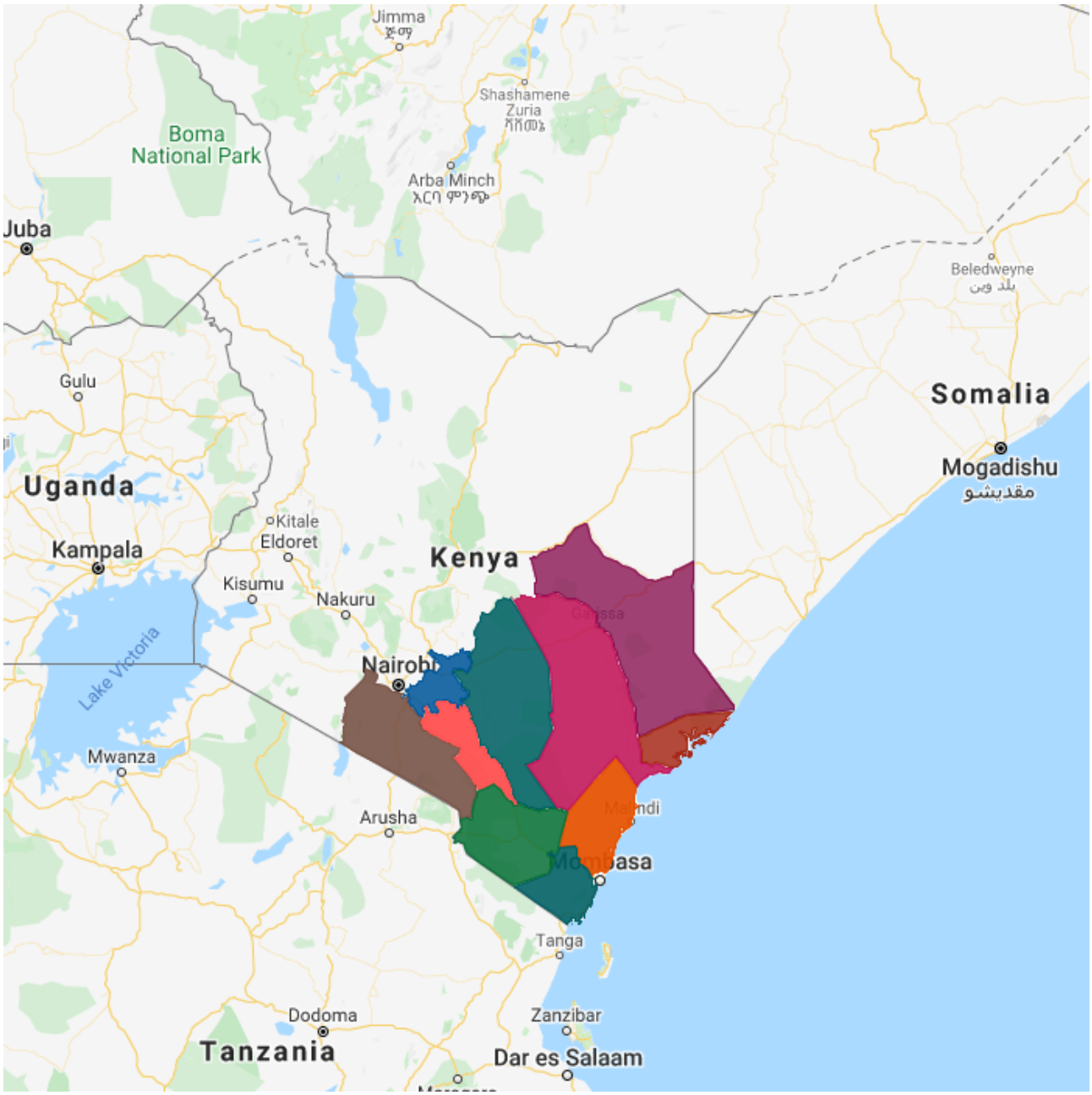


Figure 1. Map of Kenya with Project Boundary.

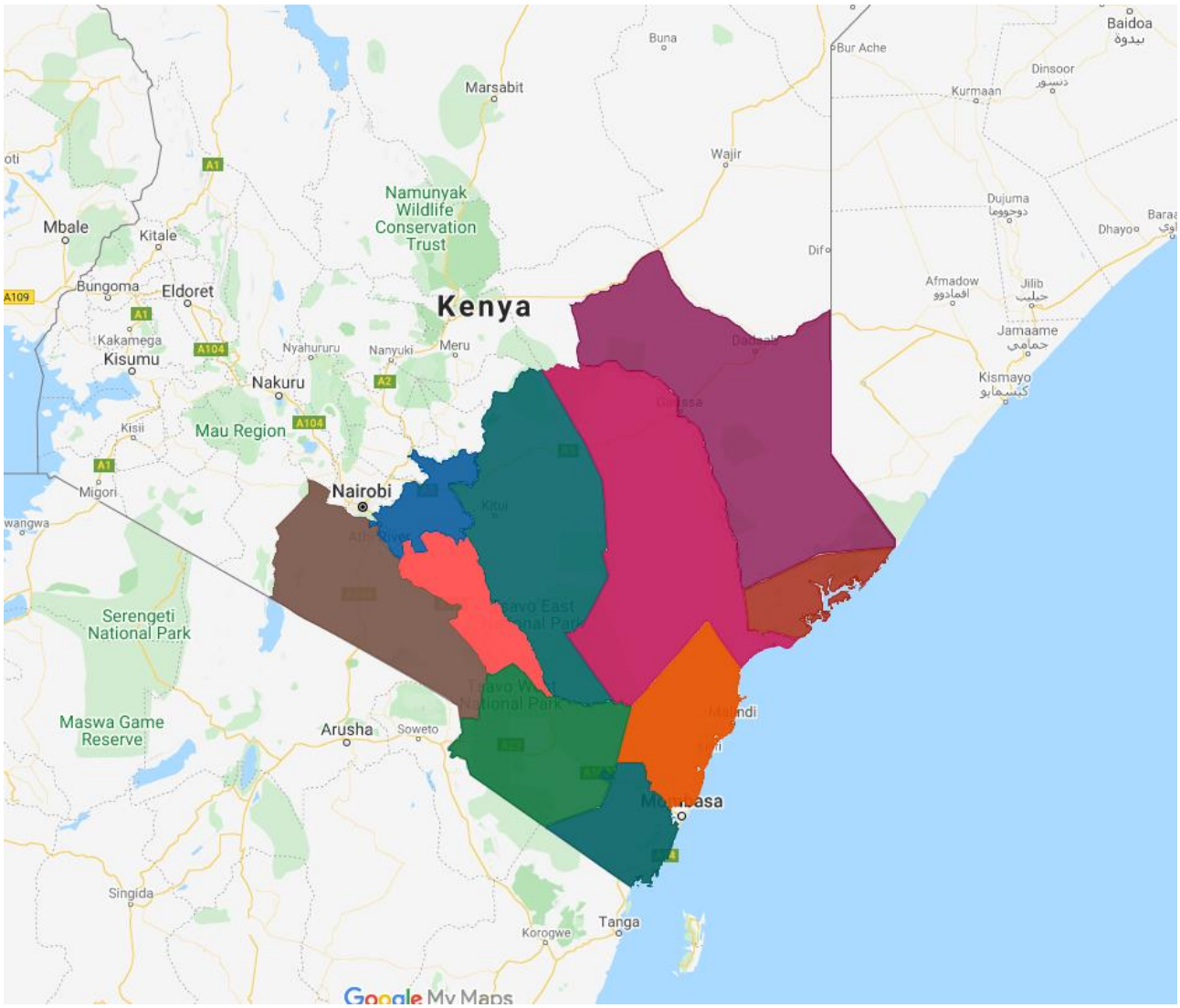


Figure 2. Close up of Project Boundary.

Project Area Extremities		
	Latitude	Longitude
North	0.95092	39.4953
South	-4.71569	39.37513
East	-1.65802	41.56236
West	-4.71569	39.37513

A.3. Technologies and/or measures

In this project, solar desalination plants are installed to deliver clean, safe water for human consumption contributing positively to SDG 6. Likewise, the reduction in local

water-borne diseases is predicted to decrease the incidence of stomach related illnesses and diarrhoea, contributing positively to SDG 3.

A comprehensive maintenance programme is required in order to guarantee a consistent supply of pure water from the solar desalination plants that have been installed. Daily checklists are in place as standard practice. Also, the solar desalination plants contain consumable parts that require periodic replacement. All maintenance is conducted by trained local GivePower Foundation employees and will endure the activity of the project.

Following installment, it is predicted that women's time spent collecting and/or purchasing water and boiling fuels will be reduced, contributing positively to SDG 5. Furthermore, the provision of clean, safe water should displace the need to boil water for purification. This will achieve a reduction in GHG emissions and aligns with SDG 13.

Solar Desalination Plant Technology

GivePower Foundation have developed a revolutionary solar-powered clean water solution. The containerized solar-powered desalination units provide sustainable and scalable safe water supply.
There are two different models of solar desalination plant currently intended for use within the project: the MAXI and Mobi^{+}. The project may also include other models of GivePower's solar desalination plants.

Figure 3. Photograph example of the GivePower MAXI plant.

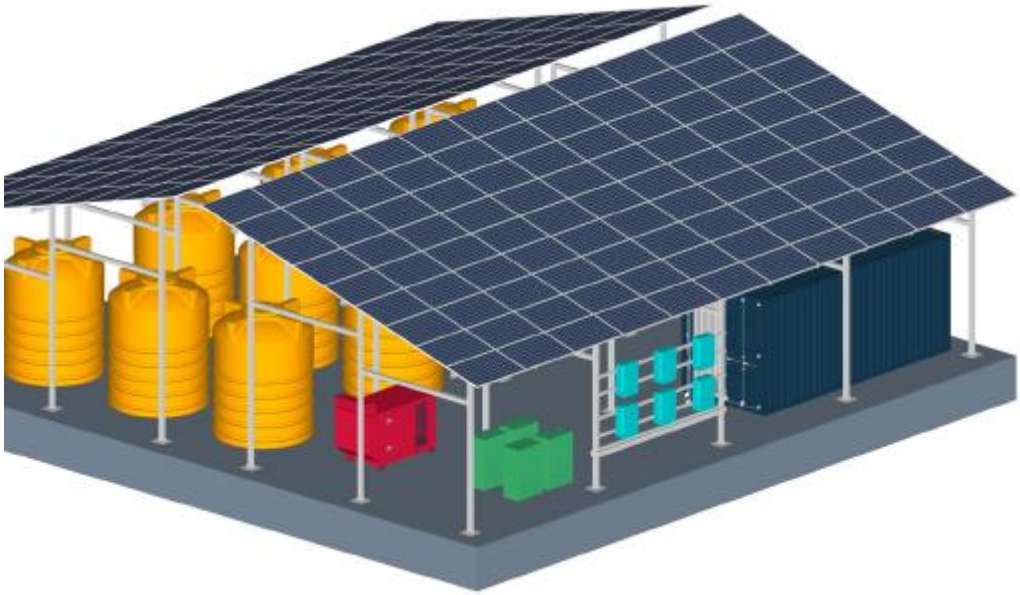


Figure 4. Digital drawing of GivePower MAXI plant.

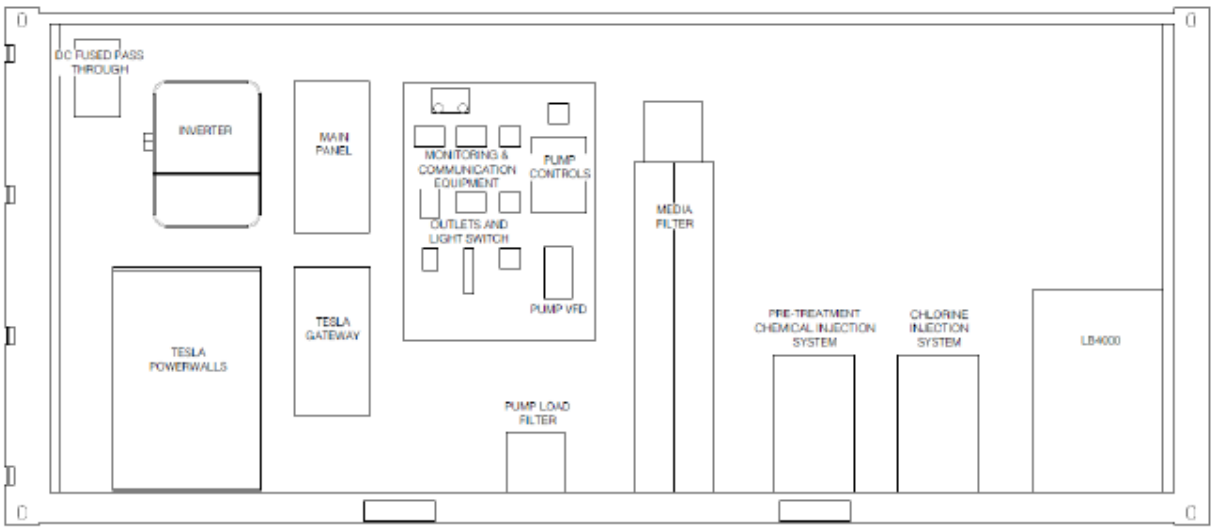


Figure 5. Mobi+ schematic.

Technical Specifications:

Model	**MAXI**	**Mobi+**
Treatment Capacity (litres per day)	70,000	15,000
Water storage capacity (litres)	90,000	10,000
Operational Power requirements (kW of solar energy)	50	7.7
Energy storage capacity (kWh)	135	27
Targeted water consumption (litres per person per day)	10-15	10-15
Maximum targeted population to serve	20,000	4,250
Expected Lifespan	20 years	20 years

A.4. Scale of the project

This VPA meets the relevant activity requirements for a small-scale project. Emission reductions achieved by the SS-VPA will be limited to 60,000 ERs per year, as per rule update 'Application of Suppressed Demand, Project Type and Applicable Scale Threshold'.

A.5. Funding sources of project

Upfront funding for the installation of the solar desalination plants comes internally from GivePower Foundation. There is no public or ODA funding for this project activity, all revenue for the project will be derived through the sale of water to consumers and from VERs.

SECTION B. APPLICATION OF APPROVED GOLD STANDARD METHODOLOGY (IES) AND/OR DEMONSTRATION OF SDG CONTRIBUTIONS

B.1. Reference of approved methodology (ies)

Gold Standard Methodology: Technologies and Practices to Displace Decentralized Thermal Energy Consumption Version 3.1.

B.2. Applicability of methodology (ies)

In accordance with the Gold Standard Methodology: Technologies and Practices to Displace Decentralized Thermal Energy Consumption Version 3.1, Small-scale VPAs listed in Mombasa County, Kenya, boundary adhere to the following conditions:

Methodology Requirement	Project
1. The project boundary can be clearly identified, and the technologies counted in the project are not included in another voluntary market or CDM project activity.	The project area has been clearly demarcated using political boundaries recognized in Kenya. Each technology will be recorded using GPS coordinates and individually tagged with an identification code which is stored securely in the project database. Regular project surveys together with distribution records will ensure that the technologies included in the project are not double counted.
2. Technologies have a continuous useful energy output of less than 150kW per unit (defined as total energy delivered usefully from start to end of operation of a unit divided by time of operation). For technologies or practices that do not deliver thermal energy in the project scenario but only displace thermal energy supplied in the baseline scenario, the 150kW threshold applies to the displaced baseline technology.	The project technology does not deliver thermal energy; the installation of solar desalination plants displace energy supplied in the baseline as they eliminate the need to purify water through boiling; the 150kw threshold therefore applies to the baseline technology. Solar desalination plants displace energy supplied in the baseline as they eliminate the need to purify water through boiling. The estimated

	energy output of the baseline technology is 3.83 and 1.81 kW per wood and charcoal users respectively, which is well within the methodological limit of 150kW. This has been proven via calculation found in the Ex-ante excel.
3. The use of the baseline technology as a backup or auxiliary technology in parallel with the improved technology introduced by the project activity is permitted as long as a mechanism is put into place to encourage the removal of the old technology and the definitive discontinuity of its use.	As noted in the Gold Standard Methodology p.5. 'the removal and continued non-use of three stone fires and other easily constructed traditional devices (the baseline technology replaced by this project activity) is in many cases unlikely and impractical to monitor.' However, local people will be educated on the health and environmental benefits of abandoning inefficient use of the baseline technology. Furthermore, a WASH program will be carried out parallel to the project which will help to increase awareness regarding water use, health and hygiene among local communities. This education programme will act as a mechanism to encourage the removal of old technology.
a) The project documentation must provide a clear description of the approach chosen and the monitoring plan must allow for a good understanding of the extent to which the baseline technology is still in use after the introduction of the improved technology, whether the existing baseline technology is not surrendered	Overall use of the baseline technology will be monitored in conjunction with that of the project technology, as will the emergence of any other baseline technology by targeted end users. As per the Methodology kitchen surveys will be carried out at regular intervals to determine any changes in baseline technology use. The baseline survey is

at the time of the introduction of the improved technology, or whether a new baseline technology is acquired and put to use by targeted end users during the project crediting period.	yet to be completed but initial scoping activities indicate the majority of households in the targeted areas were using either a traditional wood fire to boil water which consists of a three-stone fire, or a traditional charcoal stove.
b) The success of the mechanism put into place must therefore be monitored, and the approach must be adjusted if proven unsuccessful. If an old technology remains in use in parallel with the improved technology, corresponding emissions must of course be accounted for as part of the project emissions.	Parallel baseline technology use (three stone fires or traditional equivalent) will be revealed during monitoring and its effect on emissions reductions will be captured in the parameter Q, p, clean boil, y and in the usage surveys. The uptake rate U will also be determined by surveys and hence used to account for parallel baseline and project technology use.
4. The project proponent must clearly communicate to all project participants the entity that is claiming ownership rights of and selling the emission reductions resulting from the project activity. This must be communicated to the technology producers and the retailers of the improved technology or the renewable fuel in use in the project situation by contract or clear written assertions in the transaction paperwork. If the claimants are not the project technology end users, the end users should be notified that they cannot claim for emission reductions from the project.	A full explanation will be given to solar desalination plant managers that GivePower Foundation, in agreement with CO2balance, have committed to provide them with a solar desalination plant that is fully maintained using carbon finance revenues on the basis that the emissions reductions will be transferred to GivePower Foundation, in agreement with CO2balance. This will be recorded using a Carbon Transfer Form, which is signed by project technology site managers.

5. Project activities making use of a new biomass feedstock in the project situation (e.g. shift from non-renewable to green charcoal, plant oil or renewable biomass briquettes) must comply with relevant Gold Standard specific requirements for biomass related project activities, as defined in the latest version of the Gold Standard rules.	As the technology used in this project has been specifically designed to displace baseline feedstock use via fuelwood and charcoal, rather than a new biomass feedstock, this criterion is not applicable to this project. The emission reductions from this project will result from a change in quantity of fuel consumed, rather than change of fuel type.
a) Adequate evidence is supplied to demonstrate that indoor air pollution (IAP) levels are not worsened compared to the baseline, and greenhouse gases (as listed in section 2.1) emitted by the project fuel/stove combination are estimated with adequate precision. The project fuel/stove combination may include instances in which the project stove is a baseline stove.	The fuel used in both the project and baseline scenario is the same, as such there are no additional harmful gases released in the project scenario. The baseline technology has also not changed; rather its use for boiling will have been eliminated.
b) Records of renewable fuel sales may not be used as sole parameters for emission reduction calculation, but may be used as data informing the equations in section 2.0 of this methodology if correlated to data on distribution and results of field tests and surveys confirming (a) actual use of the renewable fuel and usage patterns such as average fraction of non-renewable fuels used in mixed combustion or seasonal variation of fuel types, (b) GHG emissions, (c) evidence of CO levels not	Renewable fuels are not sold as part of this project therefore this point is not applicable.

deteriorating (d) any further factors effecting emission reductions significantly.	

B.3. Project boundary

The physical boundary of the project is shown in section A.2 of this document.

Source		GHGs	Included?	Justification/Explanation
Baseline scenario	Combustion of wood fuel to boil water	CO_2	Yes	Important source of emissions
		CH_4	Yes	Important source of emissions
		N_2O	Yes	Gas included in the calculations. Emissions factors for fuel in stationary combustion by the IPCC
	Combustion of charcoal fuel to boil water	CO_2	Yes	Important source of emissions
		CH_4	Yes	Important source of emissions
		N_2O	Yes	Gas included in the calculations. Emissions factors for fuel in stationary combustion by the IPCC
Project scenario	Combustion of wood fuel to boil water	CO_2	Yes	Important source of emissions
		CH_4	Yes	Important source of emissions
		N_2O	Yes	Gas included in the calculations. Emissions factors for fuel in stationary combustion by the IPCC
	Combustion of charcoal fuel to boil water	CO_2	Yes	Important source of emissions
		CH_4	Yes	Important source of emissions
		N_2O	Yes	Gas included in the calculations. Emissions factors for fuel in stationary combustion by the IPCC

B.4. Establishment and description of baseline scenario

In Kenya, rural and peri-urban people typically use wood and charcoal fuels on inefficient traditional technologies, such as the three stone fire in the case of wood

fuel, for cooking and water purification. This process results in the release of greenhouse gas emissions from the combustion of wood and charcoal. This can be avoided if a technology is used that is more efficient.

A large proportion of Kenyan nationals do not have access to safe water[5], many of whom depend on boiling as the only treatment method available or are forced to drink dirty water due to suppressed demand factors such as lack of access to fuel, time and financial resources.

In this project, GivePower Foundation, in partnership with CO2balance, will install solar desalination plants and manage them so that they deliver clean and safe water to local communities. The number of solar desalination plants per VPA will be limited by the amount of pure water supplied by each unit and the unit model (see Section A.3). Based on ex ante calculations, the maximum number of desalination plants that can be installed in one VPA to achieve 60,000 tCO2e is approximately between 6-9. However, the exact number will be determined once actual survey data has been collected. GivePower Foundation and CO2balance will install and deliver a maintenance programme for each solar desalination plant to ensure that the quality of the water delivered is fit for human consumption for the entire length of the project, which will be a minimum of 5 years.

The baseline situation is not expected to change significantly during the next years considering the current situation in Kenya, its economic development of the last years and predictions for the future. Kenya is a developing country (LMIDC) and is among the poorest countries in the world with a Human Development Index ranking of 143 out of 189 countries worldwide.[6]

Baseline Scenario

The baseline scenario is assessed through use of the Baseline Survey.

In accordance with the GS4GG Methodology "Technologies and Practices to Displace Decentralized Thermal Energy Consumption" (TPDDTEC), baseline surveys are carried out using representative and random sampling. The sample size is determined in line with the methodological minimum sample size and confidence requirements. As the project technology is installed at the start of the project, the baseline scenario is considered fixed throughout the crediting period.

The Baseline Survey was conducted across four districts representative of the project area: Likoni, Bamburi, Makindu and Kibwezi West. These took place between 17th and 25th February 2021.

[5] https://www.who.int/water_sanitation_health/publications/jmp-2019-full-report.pdf
[6] United Nations Development Programme (2019) 'Human Development Indicators' http://hdr.undp.org/en/countries/profiles/KEN

Default values of 0.4 and 0.1 kgs of wood and charcoal respectively per litre of water boiled have been used for parameters Wb,y.

Baseline Survey:

In line with Gold Standard requirements the Baseline Survey will provide critical information on target population characteristics, water and fuel consumption needed to purify water, suppressed demand and leakage. According to the relevant Gold Standard methodology the following information will be captured in the surveys:

- Address or location
- Telephone number (where possible)
- Number of people served by baseline technology(ies)
- Typical baseline technology usage patterns and tasks (commercial, institutional, domestic etc)
- Types of baseline technology used and estimated frequency
- Types of fuels used and estimated quantities
- Seasonal variations in baseline technology and fuel use
- Sources of fuels and prices paid or effort made to collect fuels

Suppressed demand is determined through a set of questions in the Baseline Survey that establish the method households use to purify their water, if any, and how they would choose to purify if they were not subject to monetary and access barriers.

The fixed parameters from the Baseline Survey are:

Parameter	Description	Value
Cj	Proportion of users who consume safe water in the baseline scenario	7.0%
Xboil	Proportion of users that would use other non-GHG emitting technologies in absence of project activities	17.4%
Supressed Demand Users	Proportion of users who are unable to boil or treat unsafe water in the baseline scenario due to limited resources, but who would boil as a treatment method if it was available to them	56.9%
Pb,boil	Proportion of users that boil water as a treatment method in the baseline scenario	24.6%

Parameter Wb,y:

Default values shall be used in place of the BWBT, in accordance with TPDDTEC v3.1. The Baseline Survey shows that 24% of users' primary cooking device is a traditional wood stove, and 72% use a charcoal stove. 1% and 2% use LPG and kerosene, but this is regarded as *de minimis* and will not be accounted for in the Project.

The default values for wood fuel and charcoal are as follows:

Fuel Type	% of users' primary fuel	Value	Unit
Wood Fuel	24%	0.4	Kg/L
Charcoal	72%	0.1	Kg/L

B.5. Demonstration of additionality

Specify the methodology, activity requirement or product requirement that establishes deemed additionality for the proposed project (including the version number and the specific paragraph, if applicable).	As demonstrated in the Gold Standard for the Global Goals Community Services Activity Requirements section 4.1.9 - Projects that meet any of the following criteria are considered as deemed additional and therefore are not required to prove Financial Additionality at the time of Design Certification: 1. (a) Positive list (Annex B) 2. (b) Projects located in LDC, SIDS, LLDC 3. (c) Micro-scale projects
Describe how the proposed project meets the criteria for deemed additionality.	Additionality is demonstrated using the UNFCCC Tool for the demonstration and assessment of additionality (Version 7) which shows that the project would not be possible without VER revenues. Steps 0, 1,3 and 4 will be applied. **Step 0: First of its kind project activities. Is the proposed project activity the first-of-its-kind?** **Outcome of step 0:** No, the project activity is not the

	first-of-its-kind. **Step 1: Identification of alternatives to the project activity consistent with current laws and regulations**. ***Sub-step 1a: define alternatives to the project activity:*** **Alternative 1:** Solar Desalination Plants are installed without registering as a Gold Standard VER project. *Under this alternative scenario, the project would proceed as laid out in this document. This would provide the same displacement of thermal energy, result in the biomass savings, improved livelihoods and other contributions to sustainable development identified.* **Alternative 2:** The distribution of chlorine tablets for the treatment of unsafe water. *Under this alternative scenario, the project would not occur as described in this document and instead, chlorine tablets would be distributed for the treatment of water collected from unsafe sources. This would provide the same displacement of thermal energy and result in the biomass savings for the beneficiaries.* **Alternative 3:** Continuation of the current situation – use of boiling to purify water on traditional 3-stone fireplaces and charcoal stoves as well as the consumption of unsafe water.

	Without the intervention of the project and use of carbon finance it is unlikely that the status quo will change. **Outcome of sub-step 1a:** Three realistic and credible alternatives to the project activity have been identified. ***Sub-step 1b: Consistency with mandatory laws and regulations*** The alternatives identified in Sub-step 1a above are in compliance with the mandatory laws and regulations in Kenya. **Outcome of sub-step 1b:** Three realistic and credible alternative scenarios to the project activity that are in compliance with mandatory legislation and regulations, taking into account the enforcement in the region and national and/or sectoral policies and regulations. **Step 3: Barrier Analysis** ***Sub-step 3a: Identify barriers that would prevent the implementation of the proposed GS VER project activity:*** a) Investment barriers The project technology is not widespread throughout the Host Country and Region. Kenya's energy mix for electricity generation, which demonstrates prevalence

	of solar photovoltaic technology, shows that solar PV electricity generation makes up a small proportion of the total electricity generated and is likely to stay relatively low[7]. Previous research on solar desalination has highlighted the difficulty in accessing renewable energy sources for desalination[8]. Desalination is also highly energy-intensive with UNFCCC default energy intensity figures for brackish water desalination averaging at 1.4233 kWh/m3[9]. High energy requirements for production imply high costs in producing clean water via desalination. Other research focusing on small-scale solar desalination units found average production of clean water at 2.35L – 5.9L water per day[10], although this technology is very different from the project technology which produces up to 70,000 litres of water per day for communities to use; rather than individual people and/or households. In addition, alternatives undertaken by private

[7] IEA, Kenya electricity generation by technology in the Stated Policies Scenario, 2010-2040, IEA, Paris https://www.iea.org/data-and-statistics/charts/kenya-electricity-generation-by-technology-in-the-stated-policies-scenario-2010-2040

[8] Leijon, J., Salar, D., Engström, J., Leijon, M., & Boström, C. (2020). Variable renewable energy sources for powering reverse osmosis desalination, with a case study of wave powered desalination for Kilifi, Kenya. Desalination, 494, 114669.

[9] https://unfccc.int/sites/default/files/resource/AHSA-004_Default%20Energy%20Intensity%20Factors%20for%20Water%20Supply%20Systems_v1.pdf

[10] Mwamburi, E. K. (2013). Factors affecting access of water supply in Kisauni area, Mombasa County, Kenya (Doctoral dissertation).

enterprises have also utilized GS VERs as a funding source[11]. Without the revenue provided by GS VERs, implementation of Solar Desalination Plant technology by private entities has not occurred.

In summary, investment barriers to implementation exist due to high costs, energy intensity and exclusivity of technology at this scale.

b) Technological barriers

Low rate of access to improved drinking water facilities in Kenya has been well documented[12]. This suggests Macro-level factors are acting as barriers to safe water access, even of more basic safe water provision sources such as handpumps and basic water filtration systems.

The project technology is designed and created outside of the Host Country, meaning that the technology is not widely available in the host country and region. This acts as a technological barrier as the technology has not dispersed into the host country and appropriately skilled/trained labour does not exist to maintain the project technology. Any project technology installation requires the VPA Implementer to specifically train site staff to ensure adequate operation and maintenance for example. This presents a significant barrier to implementation without the anticipated VER carbon credits.

[11] https://registry.goldstandard.org/projects/details/2753
[12] https://washdata.org/data

Outcome of sub-step 3a: Barriers have been identified that may prevent one or more alternative scenarios to occur.

Sub-step 3b: Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity):

Due to the investment needed to provide chlorination tablets in the 'Alternative 2' scenario identified in sub-step 1a, this scenario would also be prevented from occurring by the barriers identified in sub-step 3a and has been eliminated from consideration.

'Alternative 3' is not affected by any of the barriers identified in sub-step 3a.

Outcome of step 3: Both sub-steps 3a – 3b are satisfied.

Step 4: Common practice analysis
Sub-step 4a: The proposed CDM project activity(ies) applies measure(s) that are listed in the definitions section above.
The proposed project activity is defined by the Gold Standard Community Services Activity Requirements as a Water, sanitation and hygiene (WASH) project. Therefore, the proposed project activity does not apply a measure listed in the definitions section of the additionality tool.

Sub-step 4b: The proposed project activity(ies) does not apply any of the measures that are listed

	in the definitions section [in the CDM Tool for the demonstration and assessment of additionality]: The project technology is distinctly unique and is only being implemented by the VPA Implementer. Containerised Solar Desalination Units from other private and public entities are not available in the host country or region. The project has supplied 'datasheets' of the project technology to support this. **Outcome of step 4:** Project is considered additional.

B.5.1. Prior Consideration

Project start date is 31/08/2020, as evidenced by the Carbon Transfer Form signed at point of installation of the first project technology. Time of first submission is within one year of the project start date, as found in the Key Project Information section of the VPA-DD. This requirement has been met.

B.5.2. Ongoing Financial Need

N/A

B.6. Sustainable Development Goals (SDG) outcomes

Relevant Target/Indicator for each of the three SDGs

Sustainable Development Goals Targeted	Most relevant SDG Target	SDG Impact Indicator (Proposed or SDG Indicator)
SDG 3 – Good Health and Well-being	3.9 – By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases.	3.9.2 - Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to

		unsafe Water, Sanitation and Hygiene for All (WASH) services)
SDG 5 - Gender Equality	5.4 – Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate.	5.4.1 -Proportion of time spent on unpaid domestic and care work, by sex, age and location
SDG 6 - Clean Water and Sanitation	6.1 – By 2030, achieve universal and equitable access to safe and affordable drinking water for all.	6.1.1 - Proportion of population using safely managed drinking water services
SDG 13 - Climate Action	13.B – Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.	13.B.1 - Number of least developed countries and small island developing States that are receiving specialized support, and amount of support, including finance, technology and capacity-building, for mechanisms for raising capacities for effective climate change-related planning and management, including focusing on women, youth and local and marginalized communities

B.6.1. Explanation of methodological choices/approaches for estimating the SDG Impact

Outcomes for SDG 3 (Good Health and Wellbeing)

The outcome for SDG 3 is quantified as the additional number of persons consuming safe water in the project activity compared to the baseline scenario (P_{safe}). The number of persons using each project technology is determined in WASH gatherings conducted under the project. The percentage of users who were already consuming safe water in the baseline without boiling it (C_j) is determined through the baseline survey and deducted. Additionally, the percentage of users who consumed safe water by boiling it in the baseline ($P_{b,\ boil}$) is deducted. Calculations are as follows:

$$P_{safe} = P_y * (1 - C_j) * (1 - P_{b,boil})$$

Where:

P_{safe} Number of additional persons having access to safe water in the project activity compared to the baseline scenario.

P_y Number of persons having access to safe water in the project activity.

C_j Expressed as a percentage, the portion of users of the project technology j who in the baseline were already consuming safe water without boiling it.

$P_{b,\ boil}$ Percentage of persons boiling water for purification in the baseline scenario.

Outcomes for SDG 5 (Gender Equality) are calculated as follows:

Women and girls perform the majority of unpaid domestic work[13]. This leaves them with less time to rest, study and realise their economic potential, leaving them in time poverty. In regard to time, women are poorer than men as unpaid domestic duties, such as collecting firewood and water, must be added to their market productive work, making time much scarcer[14]. Women are widely recognised as being principally responsible for natural resource collection[15].

[13] UN (2017) 'Progress towards the Sustainable Development Goals (E/2017/66)'. Available at https://unstats.un.org/sdgs/files/report/2017/secretary-general-sdg-report-2017--EN.pdf

[14] Charmes, J 'A Review of Empirical Evidence on Time Use in Africa from UN-Sponsored Surveys', in Word Bank (2006) 'Gender, Times Use, and Poverty in Sub-Saharan Africa'. World Bank Working Paper No. 73

[15] Nankhuni (2004) 'Environmental Degradation, Resource Scarcity and Children's Welfare in Malawi: School Attendance, School Progress, and Children's Health'

These trends demonstrate that reducing the amount of firewood required by households has the potential to reduce the time poverty of women, because the time burden of collecting firewood, which falls disproportionately on women, will be reduced. The decrease per household in time spent gathering firewood will be taken as a proxy contribution towards the SDG target.

The overall reduction in time spent collecting firewood by the project activity are then calculated as follows:the

$TRy = Tb,y - Tp,y$

Where:

TRy	Total reduction time spent collecting firewood for project activity in year y (hours)
Tb,y	Baseline time spent collecting firewood per household per day (hours)
Tp,y	Project time spent collecting firewood per household per day (hours)

Outcomes for SDG 6 (Clean Water and Sanitation) are calculated as follows:

The outcome for SDG 6 is quantified as the additional number of persons having access to safe water in the project activity compared to the baseline scenario (P_{access}). The number of persons using each solar desalination plant is determined in the sensitization process during the installation. The percentage of users who already had access to a safe water source will be determined through the baseline survey. Calculations are as follows (parameters from sections B.6.3 and B.7.1 of the VPA-DD will be applied):

$$P_{access} = P_y * (1 - C_j) * U_{p,y}$$

Where:

P_{access}	Number of additional persons having access to safe water in the project activity compared to the baseline scenario.
P_y	Number of persons having access to safe water in the project activity.
C_j	Expressed as a percentage, the portion of users of the project technology j who in the baseline were already consuming safe water without boiling it.
$U_{p,y}$	Usage rate in project scenario p during year y

Outcomes for SDG 13 (Climate Action) are calculated as follows:

The outcome for SDG 13 (Climate Action), GHG emission reductions, is calculated using the parameters in Section B.6.2 in the VPA-DD.

Baseline emissions

$$BE_{b,y} = B_{b,y} * \left(\left(fNRB_y * EF_{b,fuel,co2} \right) + EF_{b,fuel,nonco2} \right) * NCV_{b,fuel}$$

Where:

$BE_{b,y}$	Emissions for baseline scenario b during the year y in tCO_2e
$B_{b,y}$	Quantity of fuel consumed in baseline scenario b during year y, in tons, as per by-default factors
$fNRB_y$	Fraction of biomass used during year y for the considered scenario that can be established as non-renewable biomass
$NCV_{b,fuel}$	Net calorific value of the fuel that is substituted or reduced (IPCC default for wood fuel, 0.0156 TJ/ton)
$EF_{b,fuel,co2}$	CO2 emission factor of the fuel that is substituted or reduced. 112 tCO2/TJ for Wood/Wood Waste
$EF_{b,fuel,nonco2}$	Non-CO2 emission factor of the fuel that is substituted or reduced

Project emissions

$$PE_{p,y} = B_{p,y} * \left(\left(fNRB_y * EF_{p,fuel,co2} \right) + EF_{p,fuel,nonco2} \right) * NCV_{p,fuel}$$

Where:

$PE_{p,y}$	Emissions for project scenario p during the year y in tCO_2e
$B_{p,y}$	Quantity of fuel consumed in project scenario p during year y, in tons, as derived from the statistical analysis conducted on the data collected during the project performance field tests (cases when no baseline performance field test are performed, e.g. by-default baseline factors)
$fNRB_{,y}$	Fraction of biomass used during year y for the consid ered scenario that can be established as non-renewable biomass

$NCV_{p,fuel}$ Net calorific value of the project fuel (IPCC default for wood fuel, 0.0156 TJ/ton). This is equal to the baseline fuel NCV in projects which use the same fuel

$EF_{p,fuel,co2}$ CO2 emission factor of the project fuel. This is equal to the baseline fuel EF in projects which use the same fuel, 112 tCO2/TJ for Wood/Wood Waste

$EF_{p,fuel,nonco2}$ Non-CO2 emission factor of the project fuel. This is equal to the baseline fuel EF in projects which use the same fuel

Where:

$$B_{p,y} = (1 - C_j) * N_{p,y} * W_{b,y} * (Q_{p,rawboil,y} + Q_{p,cleanboil,y})$$

C_j Expressed as a percentage, the portion of users of the project technology j who in the baseline were already consuming safe water without boiling it.

$N_{p,y}$ Project technology-days in the project database for project scenario p through year y

$W_{b,y}$ Quantity of wood fuel or fossil fuel required to boil 1 litre of water using technologies representative of baseline scenario b during year y

$Q_{p,rawboil,y}$ Quantity of raw water boiled in the project scenario p per person per day

$Q_{p,cleanboil,y}$ Quantity of safe water boiled in the project scenario p per person per day

$$ER_y = \left(\left((\Sigma BE_{b,y} - \Sigma PE_{p,y}\right) * Up,y\right) - LEp,y\ ) * (1 - XBoil)$$

Where:

LEp,y Leakage for project scenario p in year y (tCO_2e)

Up,y Cumulative usage rate for technologies in project scenario p in year y, based on culmulative adoption rate and drop off rate evealed by usage surveys (fraction)

$XBoil$ Percentage of premises that would have used other non-GHG emitting technologies like chlorine treatment techniques, if available, in the absence of the project activity

B.6.2. Data and parameters fixed ex ante

SDG13

Data/parameter	$EF_{b,co2}$
Unit	tCO_2/TJ
Description	CO_2 emission factor arising from use of wood fuel in baseline scenario
Source of data	Calculated from IPCC defaults; Volume 2: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 2, Table 2.5
Value(s) applied	112 – see GS Methodology
Choice of data or Measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data/parameter	$EF_{b,co2}$ Charcoal
Unit	tCO_2/TJ
Description	CO_2 emission factor arising from use of charcoal in baseline scenario
Source of data	Calculated from IPCC defaults; Volume 2: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 2, Table 2.5
Value(s) applied	336 – see GS Methodology
Choice of data or Measurement methods and procedures	Deemed valid by Methodology

Purpose of data	Calculation of baseline emissions
Additional comment	A wood to charcoal ratio of 3 has been applied, in line with IPCC guidelines: https://www.ipcc-nggip.iges.or.jp/public/gl/guidelin/ch1ref3.pdf page 1.46

Data/parameter	$EF_{b,non\ co2}$
Unit	tCO_2e/TJ
Description	Non-CO_2 (CH_4 and N_2O) emission factor arising from use of wood fuel in baseline scenario
Source of data	IPCC Default emissions factor – https://www.ipcc-nggip.iges.or.jp/public/gp/bgp/2_2_Non-CO2_Stationary_Combustion.pdf GWP – https://www.ghgprotocol.org/sites/default/files/ghgp/Global-Warming-Potential-Values%20%28Feb%2016%202016%29_1.pdf
Value(s) applied	9.460
Choice of data or Measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculation of emission reductions
Additional comment	

Gas	Default Emissions factor (kg_gas/TJ_{NCV})	GWP of gas	Default Emissions factor (kg_CO_2e/TJ_{NCV})	Default Emissions factor (t_CO_2e/TJ_{NCV})
CH_4	300	28	8,400	8.4000
N_2O	4	265	1,060	1.060
			Total	**9.460**

Data/parameter	$EF_{b,non\ co2}$ Charcoal

Unit	tCO_2e/TJ
Description	Non-CO_2 (CH_4 and N_2O) emission factor arising from use of charcoal in baseline scenario
Source of data	IPCC Default emissions factor – https://www.ipcc-nggip.iges.or.jp/public/gp/bgp/2_2_Non-CO2_Stationary_Combustion.pdf GWP – https://www.ghgprotocol.org/sites/default/files/ghgp/Global-Warming-Potential-Values%20%28Feb%2016%202016%29_1.pdf
Value(s) applied	28.38
Choice of data or Measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculation of emission reductions
Additional comment	A wood to charcoal ratio of 3 has been applied, in line with IPCC guidelines: https://www.ipcc-nggip.iges.or.jp/public/gl/guidelin/ch1ref3.pdf page 1.46

Data/parameter	$EF_{p,co2}$
Unit	tCO_2/TJ
Description	CO_2 emission factor arising from use of wood fuel in project scenario
Source of data	Volume 2: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 2, Table 2.5
Value(s) applied	112
Choice of data or Measurement methods and procedures	Deemed valid by Methodology

Purpose of data	Calculation of emission reductions
Additional comment	-

Data/parameter	$EF_{p,co2}$ Charcoal
Unit	tCO_2/TJ
Description	CO_2 emission factor arising from use of charcoal in project scenario
Source of data	Volume 2: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 2, Table 2.5
Value(s) applied	336
Choice of data or Measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculation of emission reductions
Additional comment	For charcoal, a wood to charcoal ratio of 3 has been applied, in line with IPCC guidelines: https://www.ipcc-nggip.iges.or.jp/public/gl/guidelin/ch1ref3.pdf page 1.46

Data/parameter	$EF_{p,non\ co2}$
Unit	tCO_2e/TJ
Description	Non-CO_2 (CH_4 and N_2O) emission factor arising from use of wood fuel in project scenario
Source of data	IPCC Default emissions factor – https://www.ipcc-nggip.iges.or.jp/public/gp/bgp/2_2_Non-CO2_Stationary_Combustion.pdf GWP – https://www.ghgprotocol.org/sites/default/files/ghgp/Global-Warming-Potential-

	Values%20%28Feb%2016%202016%29_1.pdf
Value(s) applied	9.460
Choice of data or Measurement methods and procedures	Deemed valid by Methodology

Gas	Default Emissions factor (kg_gas/TJ_{NCV})	GWP of gas	Default Emissions factor (kg_CO_2e/TJ_{NCV})	Default Emissions factor (t_CO_2e/TJ_{NCV})
CH_4	300	28	8,400	8.4000
N_2O	4	265	1,060	1.060
			Total	**9.460**

Purpose of data	Calculation of emission reductions
Additional comment	-

Data/parameter	$EF_{p,non\ co2}$ Charcoal
Unit	tCO_2e/TJ
Description	Non-CO_2 (CH_4 and N_2O) emission factor arising from use of charcoal in project scenario
Source of data	IPCC Default emissions factor – https://www.ipcc-nggip.iges.or.jp/public/gp/bgp/2_2_Non-CO2_Stationary_Combustion.pdf GWP – https://www.ghgprotocol.org/sites/default/files/ghgp/Global-Warming-Potential-Values%20%28Feb%2016%202016%29_1.pdf
Value(s) applied	28.38
Choice of data or Measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculation of emission reductions
Additional comment	A wood to charcoal ratio of 3 has been applied, in line with IPCC guidelines: https://www.ipcc-

	nggip.iges.or.jp/public/gl/guidelin/ch1ref3.pdf page 1.46

Data/parameter	NCV_b
Unit	TJ/ton
Description	Net calorific value of the wood fuel used in the baseline
Source of data	IPCC Default emissions factor
Value(s) applied	0.0156
Choice of data or Measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculation of emission reductions
Additional comment	-

Data/parameter	NCV_b Charcoal
Unit	TJ/ton
Description	Net calorific value of the charcoal used in the baseline
Source of data	IPCC Default emissions factor
Value(s) applied	0.0295
Choice of data or Measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculation of emission reductions
Additional comment	-

Data/parameter	NCV_p

Unit	TJ/ton
Description	Net calorific value of the wood fuel used in the project
Source of data	IPCC Default emissions factor
Value(s) applied	0.0156
Choice of data or Measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculation of emission reductions
Additional comment	-

Data/parameter	NCV_p Charcoal
Unit	TJ/ton
Description	Net calorific value of the charcoal used in the project
Source of data	IPCC Default emissions factor
Value(s) applied	0.0295
Choice of data or Measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculation of emission reductions
Additional comment	-

Data/parameter	$f_{NRB,i,y}$
Unit	Fractional non-renewability
Description	Non-renewability status of woody biomass fuel in scenario i during year y
Source of data	Calculated in line with CDM Tool 30 EB 108 Annex 11 v3.0

	2020 CDM Default Values found here: https://cdm.unfccc.int/DNA/fNRB/index.html
Value(s) applied	0.92
Choice of data or Measurement methods and procedures	Calculation using CDM Tool 30 EB 108 Annex 11 v3.0 yielded an fNRB of 97%. For conservativeness, the project will use the lower now expired default value of 92% found here: https://cdm.unfccc.int/DNA/fNRB/index.html
Purpose of data	Calculation of emission reductions
Additional comment	-

Data/parameter	$W_{b,y}$
Unit	T/litre
Description	Quantity of wood fuel that is used to treat 1 litre of water in the baseline scenario b during year y
Source of data	Default value
Value(s) applied	0.0004
Choice of data or Measurement methods and procedures	Default values as per TPDDTEC v3.1 will be used rather than conducting a full baseline water boiling test
Purpose of data	Calculation of emission reductions
Additional comment	-

Data/parameter	$W_{p,y}$
Unit	T/litre
Description	Quantity of wood fuel that is used to treat 1 litre of water in the project scenario b during year y
Source of data	Default value

Value(s) applied	0.0004
Choice of data or Measurement methods and procedures	Default values as per TPDDTEC v3.1 will be used rather than conducting a full baseline water boiling test
Purpose of data	Calculation of emission reductions
Additional comment	-

Data/parameter	$W_{b,y}$ Charcoal
Unit	T/litre
Description	Quantity of charcoal that is used to treat 1 litre of water in the baseline scenario b during year y
Source of data	Default value
Value(s) applied	0.0001
Choice of data or Measurement methods and procedures	Default values as per TPDDTEC v3.1 will be used rather than conducting a full baseline water boiling test
Purpose of data	Calculation of emission reductions
Additional comment	-

Data/parameter	$W_{p,y}$ Charcoal
Unit	T/litre
Description	Quantity of charcoal that is used to treat 1 litre of water in the project scenario b during year y
Source of data	Default value
Value(s) applied	0.0001
Choice of data or Measurement methods	Default values as per TPDDTEC v3.1 will be used rather

and procedures	than conducting a full baseline water boiling test
Purpose of data	Calculation of emission reductions
Additional comment	-

Data/parameter	Cj
Unit	Percentage
Description	Portion of users of project safe water supply who were already in baseline using a non-boiling safe water supply
Source of data	Baseline Study
Value(s) applied	7%
Choice of data or Measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculation of emission reductions
Additional comment	-

Data/parameter	Xboil Non-Suppressed Demand
Unit	Percentage
Description	Percentage of premises that in the absence of the project activity would have used non-GHG emitting technologies like chlorine treatment techniques (if available) in the project boundary,.
Source of data	Baseline study. Credible literature, studies, survey, reports, relevant to the project target area
Value(s) applied	17.4%
Choice of data or Measurement methods	Suppressed demand will be determined through a set of questions in the project survey that establish the method households use to purify their water, if any, and how they

and procedures	would choose to purify if they were not subject to monetary and access barriers. This is in line with the Gold Standard principles of suppressed demand outline in annex 2. A fixed suppressed demand baseline has been opted for, however, in the event the project surveys show a substantial change in fuel use characteristics, a new baseline shall be conducted.
Purpose of data	Calculation of emission reductions
Additional comment	-

SDG 3

Data/parameter	$P_{b,\ boil}$
Unit	Percentage
Description	Percentage of persons boiling water in the baseline
Source of data	Baseline Survey
Value(s) applied	24.6%
Choice of data or Measurement methods and procedures	The percentage of people stating that they used to boil their water for purification in the baseline scenario, evaluated through the baseline survey.
Purpose of data	Determination of number of persons boiling water in the baseline
Additional comment	-

SDG 5

Data/parameter	$Tb_{,y}$
Unit	Hours
Description	Time spent collecting water per household per day prior to project

Source of data	Baseline survey
Value(s) applied	2.4
Choice of data or Measurement methods and procedures	Measured by question on time spent collecting firewood in the baseline survey.
Purpose of data	Calculation of SDG 5
Additional comment	-

B.6.3. Ex ante estimation of SDG Impact

SDG 3

Parameter	Description	Value	Unit	Source
Psafe	Number of additional persons having access to safe water in the project activity compared to the baseline scenario	**62,775**	people	Calculation
P_y	Number of persons having access to safe water in the project activity	90,000	people	Ex Ante Calculations Estimate
C_j	Portion of users of the project technology j who in the baseline were already consuming safe water without boiling it.	7.00%	%	Baseline Survey Report cell D58
$P_{b,\ boil}$	Percentage of persons boiling water for purification in the baseline scenario	24.6%	%	Baseline Survey Report cell D72

SDG 5

Parameter	Description	Value	Unit	Source
TRy	Total reduction time spent collecting firewood for project activity in year y (hours)	**0.50**	hours	Calculation
Tb,y	Baseline time spent collecting water per household per day	2.40	hours	Baseline Survey Q15-16
Tp,y	Project time spent collecting water per household per day	1.90	hours	Project Survey

SDG 6

Parameter	Description	Value	Unit	Source

Paccess	Number of additional persons having access to safe water in the project activity compared to the baseline scenario	**75,330**	people	Calculation
Py	Number of persons having access to safe water in the project activity	90,000	people	Ex Ante Calculations
Cj	Expressed as a percentage, the portion of users of the project technology j who in the baseline were already consuming safe water without boiling it.	7.00%	%	Baseline Survey Report cell D58
Up,y	Usage rate in project scenario p during year y	90%	%	Estimation (Project Usage Survey)

SDG 13

Woodfuel Scenario

Project Variables			
Quantity safe water litres supplied by project technology	Qp,y	L/pd	4
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0
NRB	fNRB	fraction	0.92
Usage rate	Up,y	fraction	0.9
Tonnes of wood to boil water - water boiling test	Wp,y	T/L	0.0004
% safe anyway	Cj	fraction	7.00%

Constants			
NRB	NRB	Fraction	0.92
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	9.460
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	7.00%
Person Days	Npy		7,443,991
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0004
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	4
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Suppressed Demand Assessment			
Percentage of **non**-suppressed demand users	Xboil	Percentage	17.40%

Baseline Fuel Use (Bby)	Bb,y[16]	T	9,149

Project Fuel Use (Pby)			
Portion users	Cj	fraction	7.00%
Person Days	Npy		7,443,991
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.000400
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	16,057
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	0.9
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	14,451
Capped Emission Reductions			14,451

Charcoal Scenario

Project Variables			
Quantity safe water litres supplied by project technology	Qp,y	L/pd	4
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0
NRB	fNRB	fraction	0.92
Usage rate	Up,y	fraction	0.90
Tonnes of charcoal to boil water - water boiling test	Wp,y	T/L	0.0001
% safe anyway	Cj	fraction	7.00%

Constants			
NRB	NRB	Fraction	0.92
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	336
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	28.380
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0295

[16] Bb,y = (1-Xboil) * (1 - Cj) * Nj,y * Wb,y * (Qb,y + Q b,rawboil,y)

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	7.00%
Person Days	Npy		22,475,126
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0001
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	4
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Suppressed Demand Assessment			
Percentage of **non**-suppressed demand users	Xboil	Percentage	17.40%
Baseline Fuel Use (Bby)[17]	Bb,y	T	6,906

Project Fuel Use (Pby)			
Portion users	Cj	fraction	7.00%
Person Days	Npy		22,475,126
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0001
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	68,758
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	0.9
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	61,882
Capped Emission Reductions			60,000

Total ERs wood + charcoal	Ery	tCO2/y	76,333
Capped Total ERs wood + charcoal	Ery	tCO2/y	60,000

B.6.4. Summary of ex ante estimates of each SDG outcome

Ex ante estimations for each SDG outcome will be completed following completion of the baseline study, in time for validation.

SDG 3

Year	Baseline	Project	Net benefit

[17] $B_{b,y} = (1-X_{boil}) * (1 - C_j) * N_{j,y} * W_{b,y} * (Q_{b,y} + Q_{b,rawboil,y})$

	estimate	estimate	
Year 1	27,225 people consuming safe water	90,000 people consuming safe water	62,775 additional people consuming safe water
Year 2	27,225	90,000	62,775
Year 2	27,225	90,000	62,775
Year 4	27,225	90,000	62,775
Year 5	27,225	90,000	62,775
Total	27,225	90,000	62,775
Total number of crediting years	5		
Annual average over the crediting period	**27,225**	**90,000**	**62,775**

SDG 5

Year	Baseline estimate	Project estimate	Net benefit
Year 1	2.4 hours per day collecting water	1.9 hours per day collecting water	0.5 hours saved per day
Year 2	2.4	1.9	0.5
Year 2	2.4	1.9	0.5
Year 4	2.4	1.9	0.5
Year 5	2.4	1.9	0.5
Total	2.4	1.9	0.5
Total number of crediting years	5		
Annual average over the crediting period	**2.4**	**1.9**	**0.5**

SDG 6

Year	Baseline estimate	Project estimate	Net benefit
Year 1	14,670 people with access to safe water	90,000 people with access to safe water	75,330 additional people with access to safe water
Year 2	14,670	90,000	75,330
Year 2	14,670	90,000	75,330
Year 4	14,670	90,000	75,330
Year 5	14,670	90,000	75,330
Total	14,670	90,000	75,330
Total number of crediting years	5		
Annual average over the crediting period	**14,670**	**90,000**	**75,330**

SDG 13

Year	Baseline estimate	Project estimate	Net benefit
Year 1	84,815 tCO2e	0 tCO2e	60,000 tCO2e
Year 2	84,815 tCO2e	0 tCO2e	60,000 tCO2e
Year 2	84,815 tCO2e	0 tCO2e	60,000 tCO2e
Year 4	84,815 tCO2e	0 tCO2e	60,000 tCO2e
Year 5	84,815 tCO2e	0 tCO2e	60,000 tCO2e
Total	84,815 tCO2e	0 tCO2e	60,000 tCO2e
Total number of crediting years	5		
Annual average over the crediting period	**84,815 tCO2e**	**0 tCO2e**	**60,000 tCO2e**

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

SDG 3

Data / Parameter	P_y
Unit	Number
Description	Number of persons having access to safe water from the project activity
Source of data	Water point Project Database; Default Values
Value(s) applied	90,000 (estimate)
Measurement methods and procedures	Data on total volumes of water produced and sold during the monitoring period by project technologies will be divided by the value for Qp,y.
Monitoring frequency	Annual
QA/QC procedures	Data will be cross-checked with other associated data records regarding water production and sale.
Purpose of data	To measure the additional persons with access and provision to safe water in the project scenario, which will positively impact good health and wellbeing, as well as access to clean water and sanitation.
Additional comment	-

SDG 5

Data / Parameter	$T_{p,y}$
Unit	Hours
Description	Project time spent collecting water per household per day.
Source of data	Project survey
Value(s) applied	1.9 hours (estimate)

Measurement methods and procedures	Established through questions in the project survey on a representative sample of the end users.
Monitoring frequency	Annual
QA/QC procedures	
Purpose of data	To measure the % decrease in hours spent collecting water and firewood, a responsibility falling disproportionately on women, as an indicator of reduced time poverty of women.
Additional comment	-

SDG 6

Data / Parameter	Qp,cleanboil,y
Unit	Litres per person per day
Description	Quantity of safe water boiled in the project scenario p during the year y using the zero or low emissions clean water supply technology
Source of data	Project Survey
Value(s) applied	Estimated at 0.
Measurement methods and procedures	Measured through questions in the Project Survey
Monitoring frequency	Annual
QA/QC procedures	Clear guidance is provided to field staff and results are spot checked against the hard copy of the surveys.
Purpose of data	Emission reduction calculations
Additional comment	Boiled water consumed for drinking, cooking and basic personal hygiene considered safe for human consumption prior to boiling. This is assumed from the stated water source.

Data / Parameter	Qp,rawboil, y
Unit	Litres per person per day

Description	The raw unsafe water that is still boiled after installation of the water treatment technology
Source of data	Project Survey
Value(s) applied	Estimated at 0. Actual value to be provided in time for first verification
Measurement methods and procedures	Questions in the Project Survey
Monitoring frequency	Annually
QA/QC procedures	Clear guidance is provided to field staff and results are spot checked against the hard copy of the surveys.
Purpose of data	Emission reduction calculations
Additional comment	Boiled water consumed for drinking, cooking and basic personal hygiene considered safe for human consumption prior to boiling. This is assumed from the stated water source.

Data / Parameter	Quality of Treated Water
Unit	Parameters as per national standards
Description	Performance of the treatment technology
Source of data	Laboratory Tests
Value(s) applied	Certificates supplied at verification
Measurement methods and procedures	The water quality will be tested in line with national standards in Kenya. The water samples will be taken at source by the testing body.
Monitoring frequency	Quarterly
QA/QC procedures	At least four tests each year conducted by an accredited laboratory.
Purpose of data	Criteria of methodology
Additional comment	Water is tested in accredited laboratories. Tested water is collected from source.

Data / Parameter	Hygiene campaigns
Unit	Outcome of WASH meetings
Description	Hygiene campaigns carried out among project technology users
Source of data	Annual hygiene campaign results
Value(s) applied	Report to be submitted in time for each verification.
Measurement methods and procedures	WASH Report
Monitoring frequency	Annual
QA/QC procedures	Sharing and checking of meeting pictures and participants lists.
Purpose of data	In accordance with TPDDTEC v3.1 methodology
Additional comment	Hygiene campaigns will commence once COVID-19 situation eases and conducting gatherings is deemed safe.

SDG 13

Data / Parameter	LEp,y
Unit	tCO2e per year
Description	Leakage in project scenario p during year y.
Source of data	Baseline and project surveys.
Value(s) applied	0
Measurement methods and procedures	Assessed every two years using baseline and project surveys.
Monitoring frequency	Biennial
QA/QC procedures	
Purpose of data	Emission reduction calculations
Additional comment	-

Data / Parameter	Np,y [Wood]
Unit	Project Technology Days
Description	Number of persons consuming water supplied by project scenario p through year y
Source of data	Project Database
Value(s) applied	7,443,991 (estimate)
Measurement methods and procedures	Sum of the total number of people using each project technology multiplied by the number of days crediting each project technology earns in this monitoring period
Monitoring frequency	Continuous
QA/QC procedures	Calculations are double-checked
Purpose of data	Emission reduction calculations
Additional comment	Household lists of users including details for the main contact from the household

Data / Parameter	Np,y [Charcoal]
Unit	Project Technology Days
Description	Number of persons consuming water supplied by project scenario p through year y
Source of data	Project Database
Value(s) applied	22,475,126 (estimate)
Measurement methods and procedures	Sum of the total number of people using each project technology multiplied by the number of days crediting each project technology earns in this monitoring period
Monitoring frequency	Continuous
QA/QC procedures	Calculations are double-checked
Purpose of data	Emission reduction calculations

Additional comment	Household lists of users including details for the main contact from the household

Data / Parameter	Up,y
Unit	Percentage
Description	Usage rate in project scenario p through year y
Source of data	Usage Survey
Value(s) applied	Estimated at 90%. Actual value to be provided in time for each verification.
Measurement methods and procedures	Measured quantities of water sold by the project technologies.
Monitoring frequency	Annual
QA/QC procedures	Clear guidance is provided to field staff and results are spot checked against the hard copy of the surveys.
Purpose of data	Emission reduction calculations
Additional comment	Questions are asked in a face-to-face survey and designed to establish whether a household can be considered a regular user

Data / Parameter	Qp,y
Unit	Litres per person per day
Description	Quantity of safe water supplied in the project scenario p during the year y using the zero or low emissions clean water supply technology
Source of data	Default value
Value(s) applied	4
Measurement methods and procedures	Default value
Monitoring frequency	N/A

QA/QC procedures	
Purpose of data	Emission reduction calculations
Additional comment	-

B.7.2. Sampling plan

A representative sample of technologies in the VPA will be sampled according to 90/30 confidence/precision (90% confidence interval and 30% margin of error) in accordance with the TPDDTEC v3.1 methodology. Out of the technologies selected, households will be randomly sampled, complying with the minimum sample size for the survey/test.

The solar desalination plants included in the project rely on water resellers to reach communities. For example, roughly 10-15 jerrycans per day are sold to customers who visit the solar desalination plants directly. The resellers are independent entrepreneurs who are not GivePower Foundation employees. The project cannot and should not enforce the collection of user lists on water resellers. In addition, directly recording information from customers at their homes could cause harm to the reputation of GivePower Foundation. The project will therefore collect user lists via the WASH gatherings implemented once Covid-19 situation in the host country enables.
WASH gatherings will be implemented in communities that are actively served by the project, i.e., in the immediate vicinity of the project technologies and in communities where project technology-associated water sellers travel to. At each gathering, attendees will be asked if they are project users. If so, they will be asked if they agree to be included in the project user list and agree to be contacted for the duration of the crediting period for annual monitoring.

Individual participants will be selected from the project user database using the random selection process outlined in the monitoring plan. Sample sizes will be in line with the Gold Standard requirements. The surveys below will be monitored under the approach stated:

- Project Survey – completed annually
- Usage Surveys – Completed annually

The surveys will be conducted so as to ensure that they are within the end date of the respective monitoring periods for each VPA. Surveys will be conducted electronically by field teams.

B.7.3. Other elements of monitoring plan

Installation Record

A comprehensive installation record will record the following information:

- Date of installation
- GPS location of the technology
- Quantity of plants installed
- The total volume of water being sold by each plant
- Mode of use: commercial/domestic

The installation record will be backed up electronically, with original documentation being stored in a centralised location.

Project Database

The project database will be derived from the Installation Record, with project technologies differentiated by different project scenarios (if required).

All data collected in relation to the project will be held in the local office and/or on the Project Database for the entire life cycle of the project and a period of 2 years afterwards. The data may be archived during the project in order to maintain clarity and security.

Ongoing Monitoring Studies

The following ongoing monitoring studies are conducted for each project scenario following verification of the associated initial project studies.

a) *Project Survey* – Completed annually in time for 1st verification

The project survey is conducted on representative end users of the project technology. The survey asks questions on household characteristics, water use, woodfuel use and WASH. Also, the survey asks questions to determine the following parameters for SDG impact; $TP_{,y}$ (SDG 5) and Qp,cleanboil,y (SDG 6). The project survey is conducted on a minimum sample size of 100 households.

b) Usage Survey – Completed annually, on time for any request of issuance

The usage survey provides a single usage parameter Up,y that is weighted based on drop off rates that are representative of the age distribution for project technologies in the installation record. The annual usage survey is conducted on a minimum sample size of 100 households.

c) *Quality of the treated water* - Completed quarterly, the first within 6 months of repair and in time for 1st verification

The quality of the treated water is assessed to ensure that it is fit for human consumption. It will be assessed in accordance with the Kenya Water Standards[18]. The

[18] KS EAS 12:2018; ICS 13.060.20 Second Edition 2018

parameters used to assess the water quality will be in line with Kenya Water Standards for potable water and all parameters will be shown to be within levels considered acceptable for domestic human consumption.

d) *Leakage Assessment* – Completed every other year

The potential sources of leakage will be investigated (LEp,y). If the assessment quantifies an increase in fuel consumption by the non-project households attributable to the project activity, then calculations will be adjusted to account for this.

e) *Non-renewable Biomass Assessment Update* - Reassessed at renewal of crediting period

In accordance with the methodology, the NRB assessment will remain fixed for the entire crediting period, although the project proponent may choose to reexamine the assessment at any time.

f) *Np,y Project Technology Days*

Number of persons consuming water supplied by project scenario p through year y. Sum of the total number of people using each solar desalination plant in the project multiplied by the number of days crediting each project technology earns in this monitoring period. The total number of households using each solar desalination plant will be determined through information supplied by GivePower Foundation and in house field teams. Using this method, a proxy for the total number of people using each solar desalination plant will be known and hence a figure for person days can be calculated. All monitoring tasks will be selected at random.

g) *Hygiene Campaign*

A hygiene campaign is conducted annually in the format of Water, Sanitation and Hygiene (WASH) training at the community level.

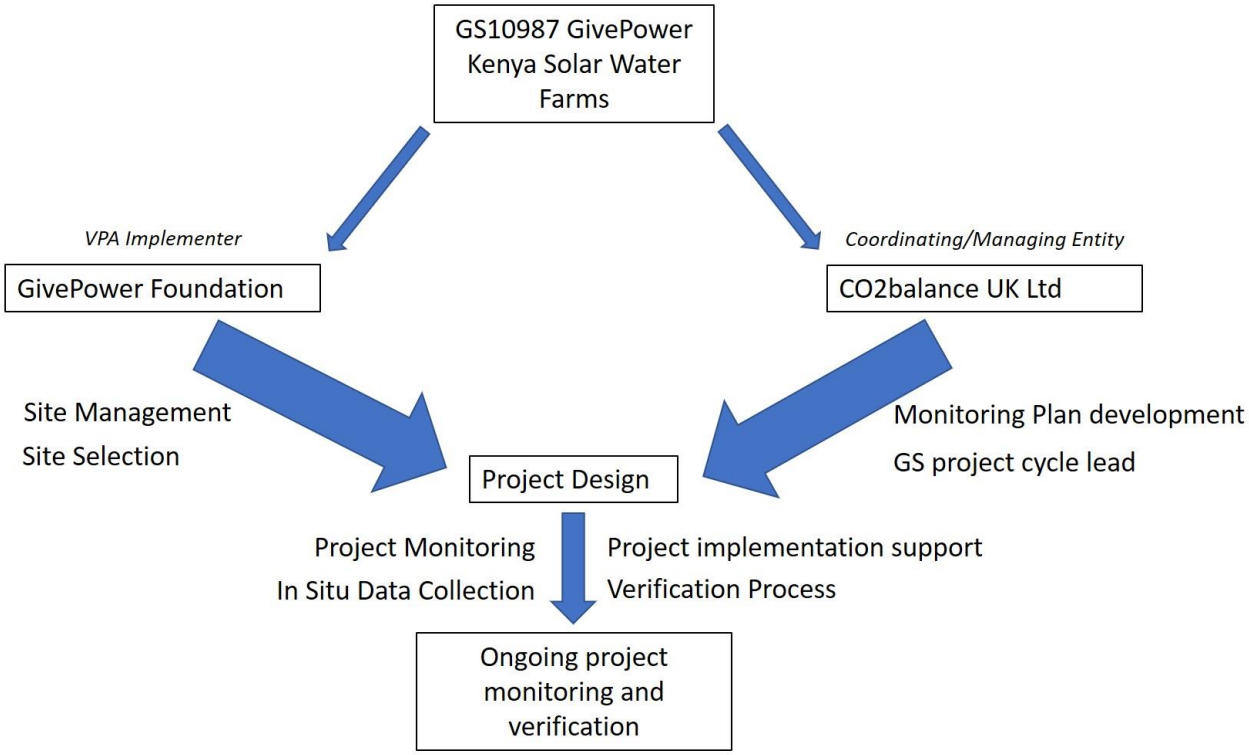
Once the Covid-19 pandemic and related laws against gatherings ease in the host country, small gatherings in communities around each solar desalination plant will be held. The trainings will act to promote best WASH practices in the communities. A WASH report will be completed annually to evaluate the success of the hygiene campaign.

WASH gatherings will also be used to collect user lists for the project, as per section B.7.2.

Hygienic handling of clean water will be assessed through WASH-related questions in the Project Survey. Questions in the Project Survey will also include reporting on instances of water borne diseases/stomach illnesses.

Outbreaks of water-borne diseases in areas surrounding each project technology shall be reported on for each monitoring period.

Operational and Management Structure



The diagram outlines the key roles and responsibilities in the project management structure. The VPA Implementer, GivePower Foundation, are responsible for Project monitoring and data collection. CO2balance UK Ltd, the CME, are responsible for the development of the monitoring plan to aid this process.

SECTION C. DURATION AND CREDITING PERIOD

C.1. Duration of project

C.1.1. Start date of project

31/08/2020

C.1.2. Expected operational lifetime of project

15 years (5 years twice renewable)

C.2. Crediting period of project

C.2.1. Start date of crediting period

01/09/2020

C.2.2. Total length of crediting period

5 years

SECTION D. SUMMARY OF SAFEGUARDING PRINCIPLES AND GENDER SENSITIVE ASSESSMENT

D.1. Safeguarding Principles that will be monitored

A completed Safeguarding Principles Assessment is in Appendix 1, ongoing monitoring is summarised below.

Principles	Mitigation Measures added to the Monitoring Plan
Principle 5. Corruption: 1. The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects	Water pricing will be transparently communicated with local users. A continuous grievance mechanism will be set up for people to voice concerns relating to corruption, among other issues. This will be set up before validation in accordance with the Covid-19 Interim Measures.
Principle 4.3 Land Tenure and Other Rights 1. Does the Project require any change, or have any uncertainties related to land tenure arrangements and/or access rights, usage rights or land ownership?	Plants will only be installed in areas where land tenure rights are agreed in advance.

D.2. Assessment that project complies with GS4GG Gender Sensitive requirements

Question 1 - Explain how the project reflects the key issues and requirements of Gender Sensitive design and implementation as outlined in the Gender Policy?	The project increases women's access to resources such as water by making safe water available in the community. The burden on the whole community of travelling far to collect water and gather firewood for water purification is reduced. This also helps to mitigate the social isolation of spending a long time collecting these resources. Both women and men benefit from the project activities, no group is excluded from participating in the project activities and the water sources are open to the whole community. The project decreases the workload of women in collecting water and firewood, thereby allowing more time to engage in other activities. The project increases women's ability to use, develop, and protect natural resources by making safe water more readily available and enabling women to participate in project decision-making.
Question 2 - Explain how the project aligns with existing country policies, strategies and best practices	Official government documentation on Gender Policy in Kenya consists of the National Gender and Equality Commission Strategic Plan for the period

2017 – 2022, succeeding its predecessor implemented from 2013 – 2015 extended to 2017. The Strategic Plan will be used as a guide to align the project with current national gender policies and best practices in Kenya.

Some of the main objectives of the Kenya Gender Strategic Plan and how the project aligns with these are as follows:

Objective 1: "To enhance awareness on the principles of equality and inclusion"

The project seeks to promote gender equality in all project related activities such as water collection, plant management, and best WASH practices. The project aims to impact upon sustainable development within the communities it touches, including contributing to the sustainable development goals, one of which is SDG 5 gender equality. The impact of the project on SDG 5 will be measured on an annual basis during project monitoring to determine the contribution towards the SDG 5 target 5.4 - Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared

responsibility within the household and the family as nationally appropriate.

Objective 2: "To enhance organisational capacity, effectiveness and efficiency"

The project contributes positively towards this objective because safe water access will be improved, reducing the burden on women and girls to travel far to collect water. This gives them more time and opportunity to pursue development enhancing activities such as income generating activities and education, which may have once been sacrificed to provide water for the homestead. This acts to close the gender gap by allowing women and girls more time for self-improvement and development. The project survey will monitor the impacts of time saved from the project and what activities respondents are choosing to do with their time saved.

Furthermore, the project technology provides clean and safe water for families to reduce the health risks of unsafe water and provide increased hygiene in the household. This helps beneficiaries achieve a more sustainable livelihood over the project lifetime.

	Objective 3 and 4: "To enhance participation and inclusion of Specialist Interest Groups (SIGs) in development agenda and to enhance stakeholder involvement" The project will not discriminate against any members of society and will encourage all members in the project area to take part in the project. In providing clean water, the projects are allowing communities to develop and lead more sustainable lives without the need to boil water for purification. The projects will help to close community and household gender gaps through the provision of clean water, regardless of existing social structures.
Question 3 - Is an Expert required for the Gender Safeguarding Principles & Requirements?	No
Question 4 - Is an Expert required to assist with Gender issues at the Stakeholder Consultation?	No

SECTION E. SUMMARY OF LOCAL STAKEHOLDER CONSULTATION

The below is a summary of the 2 step GS4GG Consultation for monitoring purposes. Please refer to the separate Stakeholder Consultation Report for a complete report on the initial consultation and stakeholder feedback round.

E.1. Summary of stakeholder mitigation measures

Following the guidance set out in the Covid-19 Interim Measures v3 document, physical stakeholder consultations are currently postponed until the Covid-19 situation eases.

Continuous input and grievance mechanisms shall be set up before commencement of project validation, in line with the requirements prescribed in Section 7 of the GS Stakeholder Consultation and Engagement Requirements. It will be ensured that stakeholders, especially communities around the project site, shall be informed about the grievance mechanism and available methods for sharing inputs and concerns.

E.2. Final continuous input / grievance mechanism

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)	As per para 2.1.1 of COVID 19: Interim Measures /28/, project developer may postpone physiicak stakeholder consultation meetings and the STanke holder Feedback Round (SFR) for Gold Standard project/POA/VPAs until the COVID-19 situation eases. CME/VPA implementer need to carry out the physical stakeholder consultation meeting and SFR at a later date as soon as the situation allows. FAR-01 has been raised in this regard. As per para 2.2.2 of COVID 19: Interim Measures /28/, VPA implementer set up a continuous input and grievances mechanism before starting the validation of the project (i.e., official submission of project design documents to the validation VVB), in line with the requirements prescribed in Section 7 of the GS Stakeholder Consultation and Engagement Requirements. The stakeholders, especially communities around the project site, were informed about the grievance mechanism and available methods for sharing inputs and concerns as checked during the remote interbiew if the CME/VPA Implementers and stakeholders. Firstly, posters at the site and information in delivery trucks have communication channels for anu stakeholder to contact the project, as well as verbal communications at the site/11/by the plant manager. GivePower's first ever public event was on 17th July 2020 where they invited stakeholders (Government officials, Ywca, religious leaders, 'youth leaders', villager elsers and women representatives.) This helped them understand the VPA. Channels of communication (i.e for grievances purposes) were raised for awareness.

	GivePower also engage with customers quarterly, visiting then and engaging in dialogue. Throughout each of the processes and in day to day running of the technologies, the opportunity for feedback is brought up and methos for sharing feedback are disclosed. This can be from face to face, to email/phone. Valid and adequate mode of communication were adopted and verified during the remote interview by the validation team.
GS Contact (mandatory)	help@goldstandard.org
Other	

APPENDIX 1 - SAFEGUARDING PRINCIPLES ASSESSMENT

Complete the Assessment below and copy all Mitigation Measures for each Principle into SECTION D above. Please refer to the instructions in the Guide to Completing this Form below.

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
Principle 1. Human Rights			
1. The Project Developer and the Project shall respect internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights 2. The Project shall not discriminate with regards to participation and inclusion	No	The project adheres to all human rights requirements including respecting internationally proclaimed human rights and Universal Declaration of Human Rights and does not discriminate in any way.	During all trainings, it is emphasised that project beneficiaries should support vulnerable or less mobile community members to access water.
Principle 2. Gender Equality			
1. The Project shall not directly or indirectly lead	No	The project increases women's access to resources such as	

to/contribute to adverse impacts on gender equality and/or the situation of women 2. Projects shall apply the principles of nondiscrimination, equal treatment, and equal pay for equal work 3. The Project shall refer to the country's national gender strategy or equivalent national commitment to aid in assessing gender risks 4. (where required) Summary of opinions and recommendations of an Expert Stakeholder(s)		water by making safe water available in the community. The burden on the whole community of travelling far to collect water and gather firewood (or purchase charcoal) for water purification is reduced. This also helps to mitigate the social isolation of spending a long time collecting these resources. Both women and men benefit from the project activities, no group is excluded from participating in the project activities and the water sources are open to the whole community. The project decreases the workload of women in collecting water and firewood (and/or charcoal), thereby allowing more time to engage in other activities.	

		The project increases women's ability to use, develop, and protect natural resources by making safe water more readily available and enabling women to participate in project decision-making. No further risks or hazards for women and girls have been identified.	
Principle 3. Community Health, Safety and Working Conditions			
1. The Project shall avoid community exposure to increased health risks and shall not adversely affect the health of the workers and the community	No	The project reduces the community exposure to water borne illness through the provision of a safe water source and reduces the risk of household air pollution by removing the need for households to boil water for purification.	Incidences of water borne illnesses are monitored through the annual Monitoring Project Survey. A WASH programme is carried out by the project, including WASH training at the beginning of the project, and subsequent annual WASH trainings.
Principle 4.1 Sites of Cultural and Historical Heritage			
Does the Project Area include	No	The project area does not	

sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture? >>		include cultural and historic sites. The focus of the project is on installing and maintaining water point infrastructure only.	
Principle 4.2 Forced Eviction and Displacement			
Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)? >>	No	The project does not impact the physical or economic relocation of peoples. The focus of the project is on installing and maintaining water point infrastructure only.	
Principle 4.3 Land Tenure and Other Rights			
Does the Project require any change, or have any uncertainties related to land tenure arrangements and/or access rights, usage rights or land ownership? >>	Yes	Land tenure rights are agreed in order to set up and operate project technologies.	Plants will only be installed in areas where land tenure rights are agreed in advance.
Principle 5. Corruption			
1. The Project shall not involve, be complicit in or inadvertently	Yes	The project ensures that all forms of corruption are avoided. Project beneficiaries	Water pricing will be transparently communicated with local users.

contribute to or reinforce corruption or corrupt Projects		are able to contact the project developer and implementer through the continuous grievance mechanism to report any form of corruption.	A continuous grievance mechanism will be set up for people to voice concerns relating to corruption, among other issues. This will be set up before validation in accordance with the Covid-19 Interim Measures.
Principle 6.1 Labour Rights			
1. The Project Developer shall ensure that all employment is in compliance with national labour occupational health and safety laws and with the principles and standards embodied in the ILO fundamental conventions 2. Workers shall be able to establish and join labour organisations 3. Working agreements with all individual workers shall be documented and implemented and include:	No	The project adheres to all labour laws and requirements	

a) Working hours (must not exceed 48 hours per week on a regular basis), AND b) Duties and tasks, AND c) Remuneration (must include provision for payment of overtime), AND d) Modalities on health insurance, AND e) Modalities on termination of the contract with provision for voluntary resignation by employee, AND f) Provision for annual leave of not less than 10 days per year, not including sick and casual leave. 4. No child labour is allowed (Exceptions for children working on their families' property requires an Expert Stakeholder opinion)			

5. The Project Developer shall ensure the use of appropriate equipment, training of workers, documentation and reporting of accidents and incidents, and emergency preparedness and response measures			
Principle 6.2 Negative Economic Consequences			
1. Does the project cause negative economic consequences during and after project implementation?	No	The project is not expected to have any negative economic impacts or cause any risks.	
>>			
Principle 7.1 Emissions			
Will the Project increase greenhouse gas emissions over the Baseline Scenario?	No	The project reduces greenhouse gas emissions compared to the baseline scenario	
>>			
Principle 7.2 Energy Supply			
Will the Project use energy from a local grid or power supply (i.e., not connected to a	No	The project uses solar photovoltaic cells that are not connected to any local grid or	

national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users?		power supply.	
>>			
Principle 8.1 Impact on Natural Water Patterns/Flows			
Will the Project affect the natural or pre-existing pattern of watercourses, ground-water and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?	No	There will be no significant change in the volume of water consumed by the households.	
>>			
Principle 8.2 Erosion and/or Water Body Instability			
Could the Project directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of erosion?	No	Water provision is for household usage. Therefore it is extremely unlikely that there is additional erosion and/or water body instability or disruption of the natural pattern of erosion.	
>>			
Principle 9.1 Landscape Modification and Soil			
Does the Project involve the	No	No crops or other products are	

use of land and soil for production of crops or other products?		produced in the project.	
>>			
Principle 9.2 Vulnerability to Natural Disaster			
Will the Project be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions?	No	There is no impact by the project to natural disasters.	
>>			
Principle 9.3 Genetic Resources			
Could the Project be negatively impacted by or involve genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development, or take place in facilities or farms that include GMOs in their processes and production)?	No	No GMOs are used in the project and the solar desalination plants would not be affected by GMOs as they are all protected.	
>>			
Principle 9.4 Release of pollutants			

Could the Project potentially result in the release of pollutants to the environment?	No	The project provides clean safe water and thus there is no risk of releasing pollutants to the environment.	
>>			
Principle 9.5 Hazardous and Non-hazardous Waste			
Will the Project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials?	No	The project does not deal with hazardous or non-hazardous chemicals and/or materials.	
>>			
Principle 9.6 Pesticides & Fertilisers			
Will the Project involve the application of pesticides and/or fertilisers?	No	No pesticides and/or fertilisers are used in the project.	
>>			
Principle 9.7 Harvesting of Forests			
Will the Project involve the harvesting of forests?	No	As the project reduces the consumption of firewood, there is a positive impact on forests.	
>>			
Principle 9.8 Food			
Does the Project modify the quantity or nutritional quality	No	The project has no impact on the quantity or nutritional	

of food available such as through crop regime alteration or export or economic incentives?		quality of food.	
>>			
Principle 9.9 Animal husbandry			
Will the Project involve animal husbandry?	No	The project does not involve animal husbandry.	
>>			
Principle 9.10 High Conservation Value Areas and Critical Habitats			
Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified?	No	The project installs solar desalination plants and decreases the consumption of firewood, having a positive impact on conserving forest ecosystems.	
>>			
Principle 9.11 Endangered Species			
Are there any endangered species identified as potentially being present within the Project boundary (including those that may route through the area)?	No	There are several endangered species in Kenya. The project is not envisaged to have any impact on their habitat as it only affects solar desalination plant infrastructure.	

AND/OR Does the Project potentially impact other areas where endangered species may be present through transboundary affects?		The project does not impact other areas where endangered species are present.	
>>			

APPENDIX 2- CONTACT INFORMATION OF VPA IMPLEMENTER

Organization name	CO2balance UK Ltd
Registration number with relevant authority	4889958 (UK company registration number)
Street/P.O. Box	Cook Way
Building	1 Discovery House
City	Taunton
State/Region	Somerset
Postcode	TA2 6BJ
Country	United Kingdom
Telephone	+441823332233
E-mail	thomas.devesa@co2balance.com
Website	www.co2balance.com
Contact person	Thomas Devesa
Title	Project Manager
Salutation	Mr
Last name	Devesa
Middle name	
First name	Thomas
Department	Projects
Mobile	
Direct tel.	+441823332233
Personal e-mail	thomas.devesa@co2balance.com

APPENDIX 3-SUMMARY OF APPROVED DESIGN CHANGES

Please refer to Annex A of Principles and Requirements for more information on procedures governing Design Changes

Revision History

Version	Date	Remarks
1.1	7 October 2020	Hyperlinked section summary to enable quick access to key sections Improved clarity on Key Project Information Inclusion criteria table added Gender sensitive requirements added Prior consideration (1 yr rule) and Ongoing Financial Need added Safeguard Principles Assessment as annex and a new section to include applicable safeguards for clarity Improved Clarity on SDG contribution/SDG Impact term used throughout Clarity on Stakeholder Consultation information required Provision of an accompanying Guide to help the user understand detailed rules and requirements
1.0	10 July 2017	Initial adoption