Gold standard for the global goals
Monitoring report

Gold Standard®

Title of the project	Gatsibo District Borehole Project
Gold Standard project id	GS3306, GS3430-3, GS4202-3, GS6786-90
Version number of the monitoring report	1
Completion date of the monitoring report	06/02/2019
Date of project design certification	GS3306: 28/7/15 GS3430-3433, 4202-3: 22/12/15 GS6786-90: 12/10/18 (date of design change)
Start date of crediting period	GS3306: 6/11/14 GS3430: 5/11/14 GS3431: 2/6/15 GS3432: 3/6/16 GS3433: 15/6/16 GS4202: 20/8/15 GS4203: 19/8/15 GS6786: 5/2/17 GS6787: 5/2/17 GS6788: 5/2/17 GS6789: 5/2/17 GS6790: 5/2/17
Duration of this monitoring period	06/02/2017 - 05/02/2019
Duration of previous monitoring period	GS3306: 08/08/2015 – 05/02/2017 GS3430: 06/02/2016 - 05/02/2017 GS3431: 06/02/2016 - 05/02/2017 GS3432: 06/02/2016 - 05/02/2017 GS3433: 06/02/2016 - 05/02/2017 GS4202: 06/02/2016 - 05/02/2017 GS4203: 06/02/2016 - 05/02/2017 GS6786: N/A GS6787: N/A GS6788: N/A GS6789: N/A GS6790: N/A
Project representative(s)	Thomas Urry
Host Country	Republic of Rwanda
Certification pathway (activity certification/impact certification)	Impact Certification
SDG Contributions targeted (as per approved PDD)	SDG 3 – Good Health and Wellbeing SDG 5 – Gender Equality SDG 6 – Clean Water and Sanitation SDG 13 – Climate Action
Gold Standard statement/product certification sought (GSVER/ADALYs/RECs etc.)	GSVER
Selected methodology(ies)	TPDDTEC v.1

Estimated amount of annual average certified SDG impact (as per approved PDD)	SDG 3- Reduction in exposure to Household Air Pollution due to boiling water: 80% SDG 5- at least 0.5 hours per trip per household time saved SDG 6 – Number of additional persons with access to safe water: 34,344 (GS3306, GS3430-33 &GS4202-3, pre-design change). SDG 13- 120,000 tCO2e per year. GS3306: 10,000 tCO2e GS3430: 10,000 tCO2e GS3431: 10,000 tCO2e GS3432: 10,000 tCO2e GS3433: 10,000 tCO2e GS4202: 10,000 tCO2e GS4203: 10,000 tCO2e GS6786: 10,000 tCO2e GS6787: 10,000 tCO2e GS6788: 10,000 tCO2e GS6789: 10,000 tCO2e GS6790: 10,000 tCO2e
Total amount of certified SDG impact (as per approved methodology) achieved in this monitoring period	SDG 3- Reduction in exposure to Household Air Pollution due to boiling water: 100% SDG 5 – 66.3% reduction in time spent collecting water SDG 6 – 34,344 additional persons with access to safe water SDG 13 – 234,127 tCO2e (ERs exceed estimates due to this being a 2 year verification.) Breakdown: GS3306: 19,907 tCO2e GS3430: 19,907 tCO2e GS3431: 19,940 tCO2e GS3432: 18,934 tCO2e GS3433: 19,907 tCO2e GS4202: 19,934 tCO2e GS4203: 19,887 tCO2e GS6786: 18,692 tCO2e GS6787: 18,828 tCO2e GS6788: 19,194 tCO2e GS6789: 19,030 tCO2e GS6790: 19,967 tCO2e

Gold Standard

SECTION A. Description of project

A.1. Purpose and general description of project

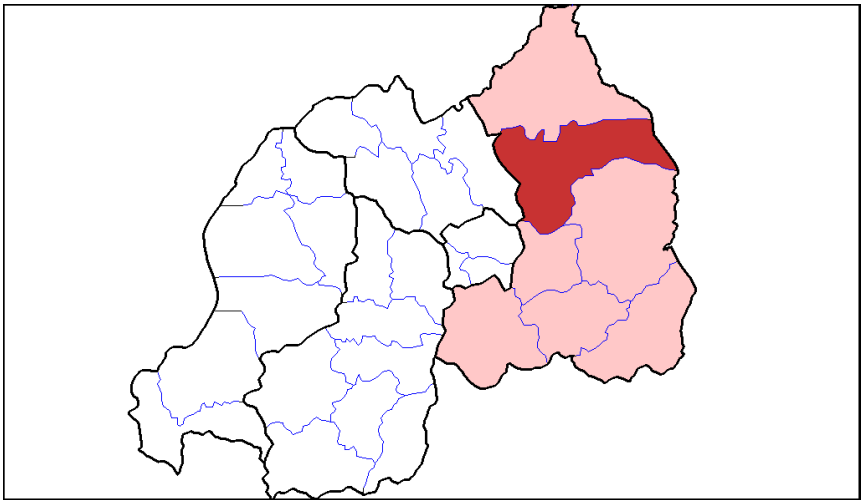
CO2balance is implementing 12 micro-scale VPAs in Gatsibo District, Rwanda, under the Gold Standard methodology *Technologies and Practices to Displace Decentralized Thermal Energy Consumption*. The project activity involves rehabilitating non-functioning boreholes to provide villages with a source of safe water. This displaces the baseline method of water treatment, which involves boiling water using solid fuel. The project activity removes the need of households to rely on firewood and coal to boil water and therefore reduces CO2 emissions.

The 63 boreholes were rehabilitated between the 31st October 2014 and 1st September 2015. The crediting periods for each VPA are given in section A.4 and have a lifetime is 7 years.

A.2. Location of project

This project is located in Gatsibo District, Eastern Province of Rwanda. Below is the geographic reference to allow unique identification of the project boundary. The target area and the fuel collection area are defined as being contained within project boundary, with the outer limits of the project boundary being clearly defined below. As the majority of beneficiaries collect their wood fuel locally in close proximity to their homesteads, the wood fuel collection area and target area are considered the same.

Map 1 Country map of Rwanda



Continent	Country	Region	District	Sector	Sub-Location	Geographical Reference	
Africa	Rwanda	Eastern Province	Gatsibo	N/A	N/A	-1.62	30.20

A.3. Reference of applied methodology

The applied methodology is Technologies and Practices to Displace Decentralized Thermal Energy Consumption Version 1 (TPDDTEC).

A.4. Crediting period of project

The start date of the crediting periods for each VPA are:
GS3306: 6/11/14
GS3430: 5/11/14
GS3431: 2/6/15
GS3432: 3/6/16
GS3433: 15/6/16
GS4202: 20/8/15
GS4203: 19/8/15
GS6786: 5/2/17
GS6787: 5/2/17
GS6788: 5/2/17
GS6789: 5/2/17
GS6790: 5/2/17
Each crediting period has a length of 7 years, as approved in the PDDs.

SECTION B. Implementation of project

B.1. Description of implemented project

In partnership with Likano Project Development GmbH and Open Circle Investments Pty Ltd, CO2balance UK Ltd is implementing a number of Micro-Scale Voluntary Project Activities under PoA 1247 in the districts of Gatsibo which are eligible under the Gold Standard methodology *Technologies and Practices to Displace Decentralized Thermal Energy Consumption*. Local people typically use wood fuel on inefficient three stone fires for cooking and water purification, which results in the release of greenhouse gas emissions from the combustion of wood. This can be avoided if a technology that does not require fuel (wood or fossil) supplies clean water desired by households.

Gatsibo is a largely rural District in which local people typically use wood fuel on inefficient three-stone fires to purify their drinking, cleaning and washing water. This process results in the release of greenhouse gas emissions from the combustion of wood. This can be avoided if a technology that does not require fuel (wood or fossil), supplies the clean water desired by households. Many existing boreholes are owned by community groups and have fallen into disrepair because maintenance programmes have been poorly managed, or proven too expensive. In this project co2balance UK Ltd., Likano Project Development GmbH and Open Circle Investments Pty Ltd work with community groups and a local NGO partner, Rwandans4Water in Gatsibo District, to identify broken down boreholes and renovate them so that they deliver clean, safe water and breakdowns are fixed rapidly.

The date of rehabilitation was confirmed by a Repair Confirmation Form, which was signed by the mechanic employed by the local NGO partner, carrying out the repair along with an elected representative of the community group owners of the borehole. The date of rehabilitation was used as the start date of operation and crediting for each borehole; we have conservatively assumed that the first day of crediting is not counted.

The number of days each borehole credited for in this monitoring period was multiplied by the number of people using the borehole to give the total number of project technology days for that borehole. The individual project technology days for each borehole were totalled to give the total number of project technology days for this monitoring period. In total 63 boreholes were rehabilitated as, initially, part of seven VPAs between the 31st October 2014 and 1st September 2015. Following a subsequent design change (see Section B.2.5.), 25 boreholes were redistributed, and five additional VPAs created, to make a total of twelve VPAs.

The project ID, location and number of people served by each borehole is given in the table below, which forms the project database.

Borehole ID	Date of rehabilitation	Start of MP3	Village	Lat	Long	Number of people using borehole
GS3306						
GAT002	05/11/2014	06/02/2017	Gashya I	-1.67096	30.40233	768
GAT003	11/11/2014	06/02/2017	Nyabisindu	-1.67096	30.40233	668
GAT004	10/11/2014	06/02/2017	Isangano	-1.65755	30.40486	510
GAT005	10/11/2014	06/02/2017	Kabane	-1.69779	30.38204	494
GAT007	11/11/2014	06/02/2017	Cyibumba	-1.4653	30.2257	520
					Total	**2960**
GS3430						

Gold Standard®

GAT010	05/11/2014	06/02/2017	Gahorawe (Gashya2)	-1.79623	30.38889	726
GAT011	04/11/2014	06/02/2017	Bushenyi	-1.81366	30.37515	583
GAT012	10/11/2014	06/02/2017	Rebero	-1.66539	30.41101	503
GAT017	05/06/2015	06/02/2017	Kabeza	1.70231	30.41547	627
GAT018	06/06/2015	06/02/2017	KabezaII	1.61215	30.38777	521
					Total	2960
GS3431						
GAT023	03/06/2015	06/02/2017	KimironkoII	-1.79045	30.37594	519
GAT024	01/06/2015	06/02/2017	Kimironko	-1.79594	30.37632	427
GAT025	09/06/2015	06/02/2017	Kiyovu	-1.643	30.4351	882
GAT026	03/06/2015	06/02/2017	MunagoI	-1.77015	30.34641	623
GAT027	02/06/2015	06/02/2017	MunagoII	-1.77091	30.35111	514
					Total	2965
GS3432						
GAT028	02/06/2015	06/02/2017	MunagoIII	-1.77097	30.35395	526
GAT030	10/06/2015	06/02/2017	Ngarama	-1.60261	30.42379	438
GAT031	11/06/2015	06/02/2017	NgaramaII	-1.58999	30.39139	545
GAT032	11/06/2015	06/02/2017	Nyabikiri	-1.58672	30.3437	857
GAT034	12/06/2015	06/02/2017	Nyamata	-1.701261	30.446767	507
					Total	2873
GS3433						
GAT037	15/06/2015	06/02/2017	ReberoIII	-1.7264	30.3922	589
GAT039	17/06/2015	06/02/2017	Rutembo	-1.656	30.4256	556
GAT042	19/06/2015	06/02/2017	Simbwa	-1.54559	30.35735	921
GAT043	26/08/2015	06/02/2017	Akabagendo	-1.7418	30.38926	655
GAT044	21/08/2015	06/02/2017	Bushenyi I	-1.79851	30.36953	239
					Total	2960
GS4202						
GAT046	24/08/2015	06/02/2017	Bymana I	-1.79391	30.3562	185
GAT047	27/08/2015	06/02/2017	Bymana II	-1.79285	30.35239	188
GAT050	25/08/2015	06/02/2017	Kiburara	-1.66785	30.41568	529
GAT051	20/08/2015	06/02/2017	Kigabiro	-1.80712	30.31485	463
GAT052	20/08/2015	06/02/2017	Maya I	-1.80419	30.31039	595
GAT053	01/09/2015	06/02/2017	Maya II	-1.85073	30.46383	519
GAT054	21/08/2015	06/02/2017	Munini	-1.80172	30.42948	485
					Total	2964
GS4203						
GAT055	19/08/2015	06/02/2017	Nyamwiza	-1.59373	30.51485	823
GAT057	28/08/2015	06/02/2017	Rebero I	-1.67283	30.39238	434
GAT058	28/08/2015	06/02/2017	Rebero II	-1.67588	30.38931	388
GAT059	18/08/2015	06/02/2017	Rebero	-1.66049	30.40731	445
GAT062	31/08/2015	06/02/2017	Rwagashyaba	-1.67711	30.40872	431

Gold Standard

GAT063	27/08/2015	06/02/2017	Tungiro	-1.67564	30.46383	436
					Total	2957
GS6786						
GAT001	05/11/2014	06/02/2017	Akabingo	-1.4846	30.255	760
GAT006	31/10/2014	06/02/2017	Rwabirenge	-1.81366	30.37515	265
GAT008	11/11/2014	06/02/2017	Kiyovu	-1.82347	30.42489	451
GAT009	12/11/2014	06/02/2017	Kimironko	-1.8091	30.3587	405
GAT021	08/06/2015	06/02/2017	KidugudulI	1.59851	30.46499	479
GAT049	19/08/2015	06/02/2017	Karambi	-1.64673	30.45684	468
					Total	2068
GS6787						
GAT029	10/06/2015	06/02/2017	Mutarama	-1.6406	30.39029	626
GAT033	12/06/2015	06/02/2017	Nyakagarama	-1.81343	30.44441	1058
GAT035	13/06/2015	06/02/2017	NyamatetelI	-1.6312	30.4297	725
GAT036	13/06/2015	06/02/2017	NyamatetelI	-1.62834	30.43798	519
					Total	2928
GS6788						
GAT013	04/06/2015	06/02/2017	Agakiri	-1.68831	30.43399	325
GAT015	01/06/2015	06/02/2017	Businde	1.80356	30.40954	824
GAT019	06/06/2015	06/02/2017	Kagugu	1.62592	30.4311	600
GAT020	08/06/2015	06/02/2017	Kamamesa	1.73264	30.39679	605
GAT022	09/06/2015	06/02/2017	KidugudulI	-1.6129	30.46591	500
					Total	2854
GS6789						
GAT016	05/06/2015	06/02/2017	Kabarondo	1.7552	30.3639	583
GAT038	16/06/2015	06/02/2017	Rugando	-1.6637	30.4354	506
GAT040	17/06/2015	06/02/2017	Rutenderi	-1.60402	30.33127	444
GAT060	24/08/2015	06/02/2017	Rubiri	-1.78246	30.40674	533
GAT061	18/08/2015	06/02/2017	Rukomo	-1.66005	30.46137	820
					Total	2886
GS6790						
GAT014	04/06/2015	06/02/2017	Akajevuba	1.6457	30.4235	692
GAT041	18/06/2015	06/02/2017	Rwimbogo	-1.65979	30.43514	524
GAT045	21/08/2015	06/02/2017	Bushenyi II	-1.79506	30.36255	252
GAT048	26/08/2015	06/02/2017	Gakiri	-1.62962	30.37743	1013
GAT056	26/08/2015	06/02/2017	Rambura	-1.67042	30.45224	488
					Total	2969

B.2. Post-registration changes

B.2.1. Temporary deviations from Certified Key Project Information, Project Design Document, Monitoring & Reporting Plan, applied methodology or applied standardized baseline

No temporary deviations have been made during this monitoring period.

B.2.2. Corrections

No corrections to project information or fixed parameters have been applied.

B.2.3. Changes to start date of crediting period

No changes have been made to the start date of the crediting period for this monitoring period.

B.2.4. Permanent changes from registered monitoring plan, applied methodology or applied standardized baseline

No permanent changes have been made for this monitoring period.

B.2.5. Changes to project design of approved project

>> (Indicate whether any changes to the design of the project have been approved by GS-TAC that is relevant for this monitoring period.)

A design change was conducted to the overall Gatsibo boreholes programme during the MP under review. Following on from the observation at the previous verification that several VPAs in the programme were crediting significantly over the annual cap of 10,000 tCO2e, the decision was taken to conduct a design change to register five additional VPAs (GS6786, GS6787, GS6788, GS6789 and GS6790) and redistribute a total of 25 boreholes into them from existing over-crediting VPAs. The design change was submitted to GS on 17th October 2018 and the review was completed on 7th December 2018.
The boreholes in the newly registered VPAs are listed below, with the origin VPA for each borehole indicated:

Borehole ID	Date of rehabilitation	Start of MP3	Village	Number of people using borehole	Original VPA
GS6786					
GAT001	05/11/2014	06/02/2017	Akabingo	760	GS3306
GAT006	31/10/2014	06/02/2017	Rwabirenge	265	GS3306
GAT008	11/11/2014	06/02/2017	Kiyovu	451	GS3306
GAT009	12/11/2014	06/02/2017	Kimironko	405	GS3306
GAT021	08/06/2015	06/02/2017	KidugudulI	479	GS3431
GAT049	19/08/2015	06/02/2017	Karambi	468	GS4202
GS6787					
GAT029	10/06/2015	06/02/2017	Mutarama	626	GS3432
GAT033	12/06/2015	06/02/2017	Nyakagarama	1058	GS3432
GAT035	13/06/2015	06/02/2017	NyamatetelI	725	GS3432
GAT036	13/06/2015	06/02/2017	NyamatetelI	519	GS3432

GS6788					
GAT013	04/06/2015	06/02/2017	Agakiri	325	GS3430
GAT015	01/06/2015	06/02/2017	Businde	824	GS3430
GAT019	06/06/2015	06/02/2017	Kagugu	600	GS3431
GAT020	08/06/2015	06/02/2017	Kamamesa	605	GS3431
GAT022	09/06/2015	06/02/2017	Kidugudul	500	GS3431

GS6789					
GAT016	05/06/2015	06/02/2017	Kabarondo	583	GS3430
GAT038	16/06/2015	06/02/2017	Rugando	506	GS3433
GAT040	17/06/2015	06/02/2017	Rutenderi	444	GS3433
GAT060	24/08/2015	06/02/2017	Rubiri	533	GS4203
GAT061	18/08/2015	06/02/2017	Rukomo	820	GS4203

GS6790					
GAT014	04/06/2015	06/02/2017	Akajevuba	692	GS3430
GAT041	18/06/2015	06/02/2017	Rwimbogo	524	GS3433
GAT045	21/08/2015	06/02/2017	Bushenyi II	252	GS3433
GAT048	26/08/2015	06/02/2017	Gakiri	1013	GS4202
GAT056	26/08/2015	06/02/2017	Rambura	488	GS4203

SECTION C. Description of monitoring system applied by the project

All surveys are administered by trained CO2balance staff and partner NGOs that are local to the area and conversant in the local dialects to ensure that the responses are consistent and not biased by any regional language barriers. Each participant is provided with a briefing on the purpose of the survey and is assured that no individual names are used in the analysis.

The results of the surveys are collated in excel spreadsheets and stored on a central server in an electronic format then is sent to the UK head office for data analysis. The documentation procedure devised ensures a minimum chance of original data being lost – all original copies of our project documentation are retained in the Kigali office and are available scanned upon request of the UK team.

In accordance with the Gold Standard methodology Technologies and Practices to Displace Decentralized Thermal Energy Consumption, the survey samples are randomly selected from the borehole user record. Each borehole user is assigned a unique random number which is then sorted in order from lowest to highest; the first nth HHs are selected for the survey. The size of the RSG is dependent on the methodological requirements and variance of the parameter being monitored to ensure the parameters measured satisfy 90/10 precision (90% confidence interval and 10% margin of error). The RSG is reselected for every monitoring period to ensure the selection remains random.

Below is a summary of the key information that has been collected and monitored as part of this project:

Borehole database

The borehole installation/rehabilitation record includes the following information:

- Date of installation/rehabilitation
- GPS location of the borehole
- Model of the borehole
- Quantity of boreholes installed
- The total number of people obtaining their water from each borehole
- Mode of use: commercial/domestic

The total number of households using each borehole has been determined through the lists supplied by the community group and district officials. Rwandans4Water further conducts studies to screen and determine the exact number of people the rehabilitated boreholes. Using this method, the total number of people using each borehole has been fixed and hence a figure for person days can be calculated.

Ongoing Monitoring Studies

The following ongoing monitoring studies were conducted; the results are given in the parameter boxes tables in Section 6.

- **Water consumption field test** (Equation parameters Qp,y and Qp,rawboil,y) – Completed prior to first verification and then biennially on a minimum sample of 40 households.

- **Quality of the treated water** - The quality of the treated water will be assessed to ensure that it is fit for human consumption. The parameters used to assess the water quality will be in line with Rwandan standards for potable water and all parameters will be shown to be within levels considered acceptable for domestic human consumption as per the WHO guidelines.

- **Usage Survey** - As all boreholes have been installed within 1 year of the start of the crediting period and are expected to last the lifetime of the project, minimum samples of 30 for different aged technologies will not be necessary. Therefore the annual usage survey will be conducted using a minimum sample size of 100.

- **Project Survey** – Conducted on a minimum sample of 100 households, surveying end users currently using project technologies to explore changes in project scenario over time.

- **Leakage assessment -** Sources of leakage detailed within the methodology relevant to this project have been reviewed.

Individual participants were selected from the borehole user data base using the random sampling process outlined in the monitoring plan. Sample sizes are in line with the Gold Standard requirements.

SECTION D. Data and parameters

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

(Copy this table for each piece of data and parameter)

Relevant SDG Indicator	**SDG 6**
Data/parameter:	P_y
Unit	Number
Description	Number of persons consuming safe water
Source of data	Baseline study.
Value(s) applied)	As per household list for each VPA
Choice of data or measurement methods and procedures	Sum of the total number of people using each borehole in the project. The total number of households using each borehole will be established through lists supplied by the water resource committee and/or community group and/or district officer responsible for that borehole. Using this method, the total number of people using each borehole will be known.
Purpose of data	Determination of number of persons using safe water.
Additional comments	-

Relevant SDG Indicator	**SDG 6 & 13**
Data/parameter:	C_j
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. Credible literature, studies, survey, reports, relevant to the project target area
Value(s) applied)	9.6%
Choice of data or measurement methods and procedures	The portion of safe water users is determined though the baseline project survey and refers to the number of users that already use safe water from water sources such as boreholes.
Purpose of data	Calculate ERs
Additional comments	-

Relevant SDG Indicator	**SDG 13**
Data/parameter:	$EF_{b,co2}$
Unit	tco_2/TJ
Description	co_2 emission factor arising from use of fuels in baseline scenario
Source of data	IPCC default value
Value(s) applied)	112
Choice of data or measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculate ERs
Additional comments	-

Relevant SDG Indicator	SDG 13
Data/parameter:	$EF_{b,non\ co2}$
Unit	tco_2/TJ
Description	Non-co_2 emission factor arising from use of fuels in baseline scenario
Source of data	IPCC default value
Value(s) applied)	8.692
Choice of data or measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculate ERs
Additional comments	-

Relevant SDG Indicator	SDG 13
Data/parameter:	NCV_b /NCV_p
Unit	TJ/ton
Description	Net calorific value of the fuels used in the project
Source of data	IPCC default value
Value(s) applied)	0.0156
Choice of data or measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculate ERs
Additional comments	

Relevant SDG Indicator	SDG 13
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	CDM Default National Figure
Value(s) applied)	0.98
Choice of data or measurement methods and procedures	$f_{NRB,i,y}$
Purpose of data	Calculate ERs
Additional comments	

Relevant SDG Indicator	**SDG 3 &13**
Data/parameter:	$W_{p,y}$
Unit	T/litre
Description	Quantity of fuel that is used to treat 1 litre of water in the project scenario p during year y
Source of data	Baseline Water Boiling Test
Value(s) applied)	0.0007363
Choice of data or measurement methods and procedures	The baseline water boiling test is used to determine the amount of wood used to purify 1 litre of water by boiling. This data is gathered according to: *Technologies and Practices to Displace Decentralized Thermal Energy Consumption* Version 1*, Draft General Guidelines On Sampling And Surveys*; EB37 Annex 27; and *Standard For Sampling And Surveys For CDM Project Activities and Programme of Activities* (Version 02); EB65 Annex 2
Purpose of data	Calculate ERs
Additional comments	

Relevant SDG Indicator	**SDG 13**
Data/parameter:	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)	0
Choice of data or measurement methods and procedures	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 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.
Purpose of data	Calculate ERs
Additional comments	

D.2. Data and parameters monitored

(Copy this table for each piece of data and parameter)

Relevant SDG Indicator/Safeguarding Principle	SDG 3 (Good Health and Wellbeing)
Data / Parameter	$HAPR_y$
Unit	%
Description	Total reduction in Household Air Pollution for project activity in year y (%)
Measured/calculated/default	Measured
Source of data	Household lists; Usage Survey; Water Consumption Field Test
Value(s) of monitored parameter	100% (All VPAs)
Monitoring equipment	-
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Review the number of people using the borehole according to the household lists for each VPA and multiply by the usage rate to calculate the number of people now using a safe water source in order to calculate the amount of biomass that would have been burnt to purify the water in the baseline scenario. Deduct from this any individuals that still boil water in the project scenario.
QA/QC procedures:	-
Purpose of data	To calculate the additional number of persons who have access to safe water in the project activity compared to the baseline scenario and to calculate from that the percentage decrease in biomass used to purify water through boiling.
Additional comments:	

Relevant SDG Indicator/Safeguarding Principle	SDG 5
Data / Parameter	TRy
Unit	Percentage
Description	Total reduction time spent collecting water for project activity in year y (%)
Measured/calculated/default	Measured
Source of data	Project Survey
Value(s) of monitored parameter	66.30% (All VPAs)
Monitoring equipment	-
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Calculate the average amount of time spent collecting water in the project scenario and compare to the pre-project scenario
QA/QC procedures:	-
Purpose of data	To quantify whether the project has contributed to a reduction in the amount of time spent collecting water compared to the pre-project scenario

Additional comments:	

Relevant SDG Indicator/Safeguarding Principle	SDG 5
Data / Parameter	Usage of time saved on water collection
Unit	Percentage
Description	Uses of time saved which was previously spent on water collection
Measured/calculated/default	Measured
Source of data	Project Survey
Value(s) of monitored parameter	1. (Unpaid) Domestic work (includes cooking and caring for family members): 19% 2. Income generating activities: 50% 3. Religious activities: 2% 4. Social and leisure activities: 17% 5. Voluntary activities: 4% 6. Education and training: 8% 7. Other (Specify): 0%
Monitoring equipment	-
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Ask users how time saved on water collection in the project scenario, as opposed to the baseline scenario, is now being used.
QA/QC procedures:	-
Purpose of data	To quantify how time which was previously spent on water collection is now being used
Additional comments:	

Relevant SDG Indicator/Safeguarding Principle	SDG 6
Data / Parameter	P_{access}
Unit	Number
Description	Number of additional persons having access to safe water in the project activity compared to the baseline scenario.
Measured/calculated/default	Measured
Source of data	Household lists; Usage Survey

Value(s) of monitored parameter	GS3306:2960 GS3430: 2960 GS3431:2965 GS3432:2873 GS3433:3062 GS4202:2964 GS4203:2957 GS6786:2068 GS6787:2928 GS6788:2854 GS6789:2886 GS6790:2969
Monitoring equipment	-
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Borehole users * Usage rate
QA/QC procedures:	-
Purpose of data:	To calculate the additional number of persons having access to safe water in the project activity compared to the baseline scenario
Additional comments:	

Relevant SDG Indicator	**SDG 13**
Data/parameter:	Np,y
Unit	Project Technology Days
Description	Number of persons consuming water supplied by project scenario p through year y
Measured/calculated/default	Measured
Source of data	Borehole Project Database
Value(s) of monitored parameter	GS3306: 2157840 GS3430: 2157840 GS3431: 2161485 GS3432: 2052452 GS3433: 2157840 GS4202: 2160756 GS4203: 2155653 GS6786: 2026166 GS6787: 2040943 GS6788: 2080566 GS6789: 2062853 GS6790: 2164401
Monitoring equipment	Borehole Project Database
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Borehole users * Total crediting days

QA/QC procedures:	-
Purpose of data:	Calculate ERs
Additional comments:	-

Relevant SDG Indicator	**SDG 3, 6 & 13**
Data/parameter:	Up,y
Unit	Percentage
Description	Usage rate in project scenario p through year y
Measured/calculated/default	Measured
Source of data	Annual Usage Survey
Value(s) of monitored parameter	100%
Monitoring equipment	The usage survey has been carried out by staff trained by CO2balance and local in-country partner Rwandans 4 Water to meet the specific requirements of the methodology. All data presented in Excel is subject to checking and cross referencing of a sample of the raw data by the project developers
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	Calculate ERs
Additional comments:	-

Relevant SDG Indicator	**SDG 3 & 13**
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
Measured/calculated/default	Measured
Source of data	Water Consumption Field Test (WCFT)
Value(s) of monitored parameter	7.5
Monitoring equipment	-
Measuring/reading/recording frequency:	Biennial
Calculation method (if applicable):	Method used similar to Kitchen Performance Test in which the volume of water consumed in each household is averaged over 3 days. The WCFT is carried out by staff trained by CO2balance and local in- country partner Rwandans 4 Water to meet the specific requirements of the methodology. All data presented in Excel is subject to checking and cross referencing of a sample of the raw data by the project developers.
QA/QC procedures:	-
Purpose of data:	Calculate ERs
Additional comments:	Value capped at 7.5

Relevant SDG Indicator	SDG 3 & 13
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
Measured/calculated/default	Measured
Source of data	WCFT
Value(s) of monitored parameter	0
Monitoring equipment	-
Measuring/reading/recording frequency:	Biennial
Calculation method (if applicable):	Method used similar to Kitchen Performance Test in which the volume of water consumed in each household is averaged over 3 days. The WCFT has been carried out by staff trained by CO2balance and local in-country partner FAPDR to meet the specific requirements of the methodology. All data presented in excel is subject to checking and cross referencing of a sample of the raw data by project developers.
QA/QC procedures:	-
Purpose of data:	Calculate ERs
Additional comments:	-

Relevant SDG Indicator	SDG 3 & 13
Data/parameter:	Qp,rawboil,y
Unit	Litres per person per day
Description	The raw of unsafe water that is still boiled after installation of the water treatment technology
Measured/calculated/default	Measured
Source of data	WCFT
Value(s) of monitored parameter	0
Monitoring equipment	-
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Method used similar to Kitchen Performance Test in which the volume of water consumed in each household is averaged over 3 days. The WCFT has been carried out by staff trained by CO2balance and local in-country partner FAPDR to meet the specific requirements of the methodology. All data presented in excel is subject to checking and cross referencing of a sample of the raw data by project developers.
QA/QC procedures:	-
Purpose of data:	Calculate ERs
Additional comments:	-

Relevant SDG Indicator	SDG 6
Data/parameter:	Quality of Treated Water
Unit	Parameters as per national standards
Description	Laboratory Tests

Measured/calculated/default	Measured
Source of data	Water quality tests
Value(s) of monitored parameter	Pass
Monitoring equipment	-
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	
QA/QC procedures:	
Purpose of data:	Ensure water is safe for human consumption without treatment using the baseline technology
Additional comments:	The Kigali based recognised laboratory has certified each water supply in line with national standards which also adheres to the WHO guidelines.

Relevant SDG Indicator	**SDG 13**
Data/parameter:	LEp,y
Unit	tCO2e per year
Description	Leakage in project scenario p during year y
Measured/calculated/default	Measured
Source of data	Baseline and monitoring surveys
Value(s) of monitored parameter	0
Monitoring equipment	-
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	Calculate ERs
Additional comments:	-

D.3. Implementation of sampling plan

The project proponent has elected to cross-sample technologies across all its homogenous borehole VPAs located within Gatsibo district. The samples for the surveys analysed below are randomly selected from the borehole information databases using the RSG procedure previously explained in line with the minimum sample size requirements as defined by the methodology. Following 90/30 precision, it was found that 5 sectors of the 9 sectors in Gatsibo district which contain boreholes in the VPAs would need to be selected for inclusion in the surveys. 5 sectors were selected by generating a random list of numbers. An aggregate list was then generated of the borehole users in the 5 selected sectors, and these were ordered according to a random list of numbers. The first 120 users were selected for the Project Survey and Usage Survey, which were conducted between 16/01/2019 and 18/01/2019. The same process was conducted in 2018, with the first 60 selected for the WCFT, between 23-26th January 2018.

The surveys have been conducted so as to ensure that they are within the end date of the respective monitoring periods for the VPAs.

SECTION E. Calculation of SDG outcomes

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

SDG 3 (Good Health and Wellbeing)

$P_{b,y} = W_{b,y} * Q_{p,y}$

Where :

$P_{b,y}$ Quantity of fuel that is consumed in the baseline scenario b during year y (kg/household-day)

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

$Q_{p,y}$ Quantity of safe water supplied in the project scenario p during year y, using the "zero or low" emissions' clean water supply technology

SDG 5 (Gender Equality)

$T_{b,y}$ Time spent collecting water per household per day prior to project (hours)

To establish $T_{b,y}$ and that the burden of collecting water falls on females, the Project Survey asks the following:

13	Before this project, who would usually go to this source to collect water for your household?	**1.** Male Adult	**2.** Female Adult
		3. Male Child	**4.** Female Child
14	How much time did it take to collect water?	*Please specify*	
15	How many trips were made per day?	*Please specify*	

SDG 6 (Clean Water and Sanitation)

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.

SDG 13 (Climate Action)

Baseline Emissions ($BE_{b,y}$)

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

Where:

$B_{b,y}$ = Quantity fuel consumed in the baseline scenario.

NRB = Country-specific default value for the fraction of non-renewable biomass.

$EF_{b,fuel,co2}$ = Emissions factor of fuel consumed in the baseline scenario (CO_2).

$EF_{b,fuel,nonco2}$ = Emissions factor of fuel consumed in the baseline scenario (non- CO_2).

$NCV_{b,fuel}$ = Net calorific value of fuel consumed in the baseline scenario.

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

>> (*Provide details of equations and approaches used to calculate/estimate project values.)*

SDG 3 (Good Health and Wellbeing)

$P_{p,y}$ Quantity of fuel that is consumed in the project scenario p during year y (kg/household-day)

$U_{p,y}$ Usage rate in project scenario p during year y

Where:

$P_{p,y} = W_{b,y} * Q_{p,cleanboil,y}$

Where:

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

$Q_{p,cleanboil,y}$ Quantity of safe water boiled in the project scenario p during year y, after installation of the project technology

SDG 5

$T_{p,y}$ Time spent collecting water per household per day in project (hours)

The project survey asks the following questions in order to establish $T_{p,y}$ and to show what use is made of the time used.

37	Who usually goes to this source to collect water for your household?	**1.** Male Adult	**2.** Female Adult
		3. Male Child	**4.** Female Child
38	How much time does a trip to and from the borehole take?	*Please specify*	
39	How many trips are made per day to the borehole?	*Please specify*	
40	Has the borehole project saved you time?	1. Yes	2. No (skip to question 44)
41	In which of these activities has the borehole project saved you the most time?	1. Less distance to walk to the water source	2. Less time waiting at the water source
		3. Less time spent boiling/purifying water	4. Less time spent collecting wood to boil water
		5. Other (Specify)	
42	How much time do you think the borehole project has saved you on average per day?	1. 0-30min	2. 31-60min
		3. 1-2hrs	4. 2-3hrs
		5. 3-4hrs	6. >4hrs
43	What do you do with the time saved from the project? *Select all that apply*	1. (Unpaid) Domestic work (*includes cooking and caring for family members*)	2. Income generating activities
		3. Religious activities	4. Social and leisure activities
		5. Voluntary activities	6. Education and training
		7. Other (Specify)	

SDG 6

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

$U_{p,y}$ Usage rate in project scenario p during year y

SDG 13

Project Emissions ($PE_{b,y}$)

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

Where:

$B_{p,y}$ = Quantity fuel consumed in project scenario.

NRB = Country-specific default value for the fraction of non-renewable biomass.

$EF_{p,fuel,co2}$ = Emissions factor of fuel used in the project scenario (CO_2).

$EF_{p,fuel,nonco2}$ = Emissions factor of fuel used in the project scenario (non- CO_2).

$NCV_{p,fuel}$ = Net calorific value of fuel used in the project scenario.

E.3. Calculation of net benefits as difference of baseline and project values or direct calculation for each SDG outcome

>>

SDG 3

$HAPR_y$ = 100% = ((5.52 - 0) / 5.52) *1

Where:

$HAPR_y = ((P_{b,y} – P_{p,y}) / P_{b,y}) * U_{p,y}$

$HAPR_y$	Total reduction in Household Air Pollution for project activity in year y (%)
$P_{b,y}$	Quantity of fuel that is consumed in the baseline scenario b during year y (kg/household-day)
$P_{p,y}$	Quantity of fuel that is consumed in the project scenario p during year y (kg/household-day)
$U_{p,y}$	Usage rate in project scenario p during year y

The project has reduced household air pollution by 100% by removing the need to boil water to make it safe to consume.

SDG 5

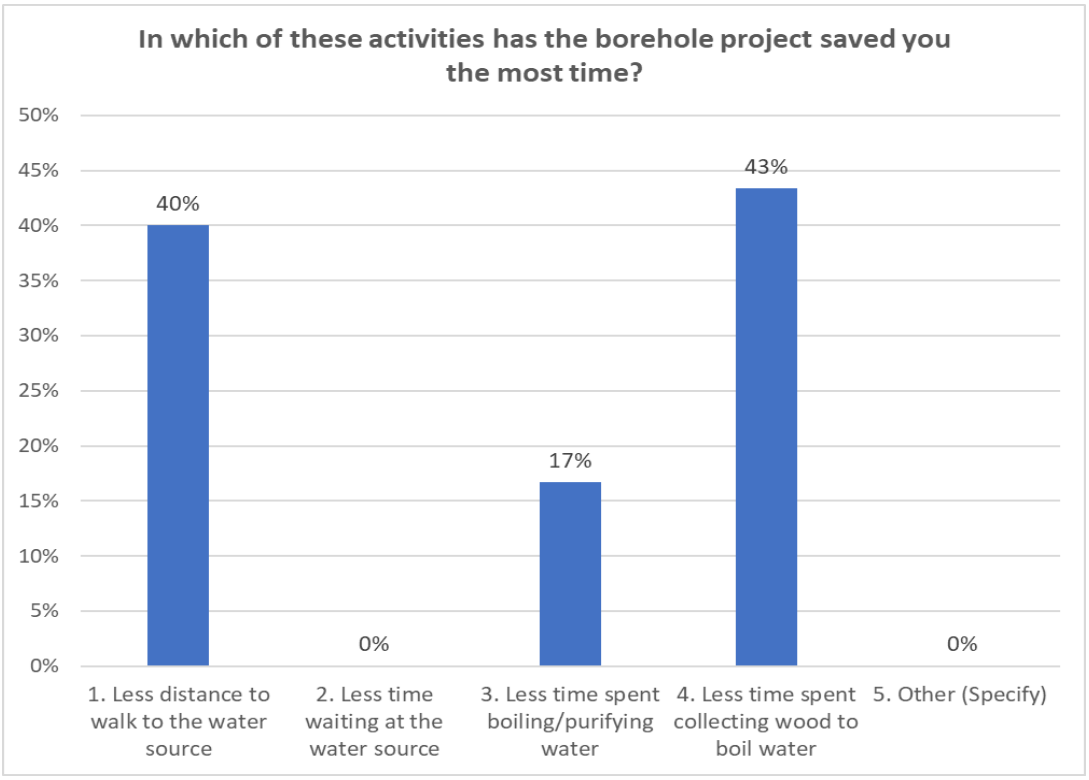
TR_y = 66.3% = (100.54 – 33.88) / 100.54

$TR_y = (T_{b,y} - T_{p,y}) / T_{b,y}$

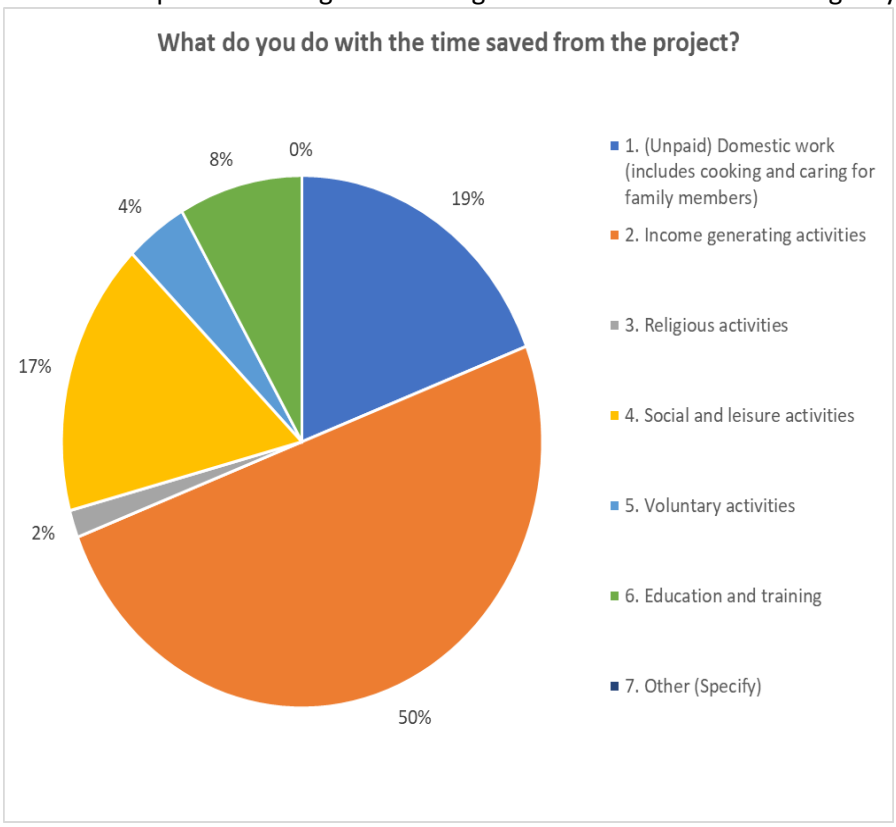
Where:

TR_y	Total reduction time spent collecting water for project activity in year y (%)
$T_{b,y}$	Time spent collecting water per household per day prior to project (hours)
$T_{p,y}$	Time spent collecting water per household per day in project (hours)

The project has saved households 66.66 minutes per day by reducing the distance needed to walk to the water source (40%), removing the need to treat the water (17%) and collect firewood (43%).



The 66.3% reduction in time spent collecting and treating water is used in the following ways:



SDG 6

P_{access} = 34,344 = 34,344 * (1 – 0) * 1

Where:

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

Using the above values for parameters Cj and Up,y, SDG was calculated for each VPA. The total number of additional persons having access to safe water in the project activity compared to the baseline scenario is 50,334.

SDG 6 Impacts	
GS ID	Paccess
GS3306	2960
GS3430	2960
GS3431	2965
GS3432	2873
GS3433	3062
GS4202	2964
GS4203	2957
GS6786	2068
GS6787	2928
GS6788	2854
GS6789	2886
GS6790	2969
Total	34446

SDG 13 and emission reductions

In MP2 the project achieved a total capped ERs of 234,127 tCO2e. Below is a summary of the ERs by VPA and vintage.

GS ID	Emissions Reductions			
	2017	2018	2019	ER total
GS3306	8957	9967	983	19906.72
GS3430	8957	9967	983	19906.72
GS3431	8972	9984	985	19940.35
GS3432	8693	9287	954	18934.49
GS3433	8957	9967	983	19906.72
GS4202	8969	9980	984	19933.62
GS4203	8948	9957	982	19886.55
GS6786	8557	9196	939	18691.99
GS6787	8860	8996	972	18828.31
GS6788	8636	9610	948	19193.85
GS6789	8733	9339	958	19030.44
GS6790	8984	9997	986	19967.25
Total	106221	116247	11658	234127.01

Gold Standard

GS3306

Emission Reductions Vintage 2017

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		970880
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	4847

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		970880
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	8,957
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**8957**

Emission Reductions Vintage 2018

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		1080400
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	5394

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		1080400
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	9,967
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**9967**

Gold Standard®

Emission Reductions Vintage 2019

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		106560
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	532

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		106560
Fossil fuel required to treat 1 litre for water in project scenari	Wp,y	T/L	0.0007363
Quantity of raw water boiled in addition to project tech wate	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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	983
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**983**

Total Emission Reductions for Monitoring Period 3

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		2157840
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	10773

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		2157840
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	19,907
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**19907**

Gold Standard®

GS3430

Emission Reductions Vintage 2017

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		970880
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	4847

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		970880
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil	L/pd	0
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	8,957
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	8957

Emission Reductions Vintage 2018

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		1080400
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	5394

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		1080400
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	9,967
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	9967

Gold Standard

Emission Reductions Vintage 2019

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		106560
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	532

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		106560
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	983
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**983**

Total Emission Reductions for Monitoring Period 3

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		2157840
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	10773

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		2157840
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	19,907
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**19907**

Gold Standard

GS3431

Emission Reductions Vintage 2017

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		972520
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	4855

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		972520
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil	L/pd	0
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	8,972
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	8972

Emission Reductions Vintage 2018

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		1082225
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	5403

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		1082225
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	9,984
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	9984

Gold Standard®

Emission Reductions Vintage 2019

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		106740
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	533

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		106740
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	985
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**985**

Total Emission Reductions for Monitoring Period 3

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		2161485
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	10791

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		2161485
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	19,940
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**19940**

Gold Standard®

GS3432

Emission Reductions Vintage 2017

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		942344
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	4705

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		942344
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil	L/pd	0
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	8,693
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	8693

Emission Reductions Vintage 2018

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		1006680
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	5026

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		1006680
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	9,287
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	9287

Gold Standard

Emission Reductions Vintage 2019

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		103428
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	516

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		103428
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	954
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**954**

Total Emission Reductions for Monitoring Period 3

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		2052452
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	10247

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		2052452
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	18,934
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**18934**

Gold Standard

GS3433

Emission Reductions Vintage 2017

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		970880
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	4847

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		970880
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil	L/pd	0
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	8,957
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	8957

Emission Reductions Vintage 2018

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		1080400
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	5394

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		1080400
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	9,967
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	9967

Gold Standard®

Emission Reductions Vintage 2019

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		106560
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	532

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		106560
Fossil fuel required to treat 1 litre for water in project scena	Wp,y	T/L	0.0007363
Quantity of raw water boiled in addition to project tech wa	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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	983
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**983**

Total Emission Reductions for Monitoring Period 3

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		2157840
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	10773

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		2157840
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	19,907
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**19907**

Gold Standard

GS4202

Emission Reductions Vintage 2017

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		972192
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	4854

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		972192
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil	L/pd	0
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	8,969
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	8969

Emission Reductions Vintage 2018

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		1081860
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	5401

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		1081860
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	9,980
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	9980

Gold Standard®

Emission Reductions Vintage 2019

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		106704
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	533

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		106704
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	984
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**984**

Total Emission Reductions for Monitoring Period 3

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		2160756
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	10787

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		2160756
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	19,934
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**19934**

Gold Standard

GS4203

Emission Reductions Vintage 2017

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		969896
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	4842

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		969896
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil	L/pd	0
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	8,948
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	8948

Emission Reductions Vintage 2018

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		1079305
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	5388

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		1079305
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	9,957
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	9957

Gold Standard®

Emission Reductions Vintage 2019

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		106452
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	531

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		106452
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	982
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**982**

Total Emission Reductions for Monitoring Period 3

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		2155653
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	10762

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		2155653
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	19,887
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**19887**

Gold Standard

GS6786

Emission Reductions Vintage 2017

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		927584
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	4631

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		927584
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil	L/pd	0
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	8,557
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	8557

Emission Reductions Vintage 2018

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		996774
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	4976

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		996774
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	9,196
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	9196

Gold Standard®

Emission Reductions Vintage 2019

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		101808
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	508

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		101808
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	939
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**939**

Total Emission Reductions for Monitoring Period 3

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		2026166
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	10116

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		2026166
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	18,692
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**18692**

Gold Standard®

GS6787

Emission Reductions Vintage 2017

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		960384
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	4795

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		960384
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil,	L/pd	0
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	8,860
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	8860

Emission Reductions Vintage 2018

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		975151
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	4868

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		975151
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	8,996
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	8996

Gold Standard

Emission Reductions Vintage 2019

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		105408
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	526

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		105408
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	972
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**972**

Total Emission Reductions for Monitoring Period 3

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		2040943
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	10189

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		2040943
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	18,828
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**18828**

Gold Standard

GS6788

Emission Reductions Vintage 2017

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		936112
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	4673

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		936112
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil	L/pd	0
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	8,636
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	8636

Emission Reductions Vintage 2018

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		1041710
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	5201

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		1041710
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	9,610
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	9610

Gold Standard

Emission Reductions Vintage 2019

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		102744
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	513

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		102744
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	948
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**948**

Total Emission Reductions for Monitoring Period 3

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		2080566
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	10387

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		2080566
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	19,194
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**19194**

Gold Standard®

GS6789

Emission Reductions Vintage 2017

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		946608
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	4726

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		946608
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil	L/pd	0
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	8,733
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	8733

Emission Reductions Vintage 2018

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		1012349
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	5054

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		1012349
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	9,339
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	9339

Gold Standard

Emission Reductions Vintage 2019

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		103896
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	519

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		103896
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	958
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**958**

Total Emission Reductions for Monitoring Period 3

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		2062853
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	10299

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		2062853
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	19,030
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**19030**

Gold Standard®

GS6790

Emission Reductions Vintage 2017

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		973832
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	4862

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		973832
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil	L/pd	0
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	8,984
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	8984

Emission Reductions Vintage 2018

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		1083685
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	5410

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		1083685
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	9,997
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	9997

Gold Standard®

Emission Reductions Vintage 2019

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		106884
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	534

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		106884
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanb	L/pd	0
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,c	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel,	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fue	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	986
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**986**

Total Emission Reductions for Monitoring Period 3

Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	9.6%
Person Days	Njy		2164401
Fuel to treat 1 litre of water using baseline tech	Wb,y	T/L	0.0007363
Quantity safe water litres consumed in project scenario supplied by project technology	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	10806

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	9.60%
Person Days	Njy		2164401
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.0007363
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

Constants			
NRB	NRB	Fraction	0.98
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	19,967
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**19967**

E.4. Summary of ex-post values of each SDG outcome for the current monitoring period

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	5.52kgs of fuel consumed per household per day	0kgs of fuel consumed per household per day	100% reduction in household air pollution caused by boiling water
SDG 5	100.54 minutes collecting water	33.88 minutes collecting water	66.66 minutes (1.11hours)/66.3% reduction in time collecting water
SDG 6	0 persons with access to safe water	34,344 persons with access to safe water	Additional 34,344 persons with access to safe water
SDG 13	234,127 tCO2e emitted	0 tCO2e emitted	Emissions reduced by 234,127 tCO2e

E.5. Comparison of actual value of outcomes with estimates in approved PDD

Not supplied in the PDD for SGDs 3, 5 and 6 as the project began prior to transition.

Item	Values estimated in ex ante calculation of approved PDD	Actual values achieved during this monitoring period
SDG 3	80% reduction in exposure to household air pollution caused by boiling water	100% reduction in exposure to household air pollution caused by boiling water
SDG 5	0.5 hours saved on time collecting water	0.79 hours saved on time collecting water
SDG 6	34,344 persons with access to safe water across all VPAs	34,344 persons with access to safe water across all VPAs
SDG 13	GS3306: 19,907 tCO2e GS3430: 19,907 tCO2e GS3431: 19,940 tCO2e GS3432: 18,934 tCO2e GS3433: 19,907 tCO2e GS4202: 19,934 tCO2e GS4203: 19,887 tCO2e GS6786: 18,692 tCO2e GS6787: 18,828 tCO2e GS6788: 19,194 tCO2e GS6789: 19,030 tCO2e GS6790: 19,967 tCO2e	GS3306: 19,907 tCO2e GS3430: 19,907 tCO2e GS3431: 19,940 tCO2e GS3432: 18,934 tCO2e GS3433: 19,907 tCO2e GS4202: 19,934 tCO2e GS4203: 19,887 tCO2e GS6786: 18,692 tCO2e GS6787: 18,828 tCO2e GS6788: 19,194 tCO2e GS6789: 19,030 tCO2e GS6790: 19,967 tCO2e

E.6. Remarks on difference from estimated value in approved PDD

The difference between estimated and actual values for SDG 13 are as follows:

VPA ID	Estimated value (tCO2e)	Actual value (tCO2e)	Comment
GS3306	10,000	19906.72	Estimated value was calculated at initial project implementation and did not take account of final borehole distribution across VPAs, nor subsequent design change.
GS3430	10,000	19906.72	Estimated value was calculated at initial project implementation and did not take account of final borehole

			distribution across VPAs, nor subsequent design change.
GS3431	10,000	19940.35	Estimated value was calculated at initial project implementation and did not take account of final borehole distribution across VPAs, nor subsequent design change.
GS3432	10,000	18934.49	Estimated value was calculated at initial project implementation and did not take account of final borehole distribution across VPAs, nor subsequent design change.
GS3433	10,000	19906.72	Estimated value was calculated at initial project implementation and did not take account of final borehole distribution across VPAs, nor subsequent design change.
GS4202	10,000	19933.62	Estimated value was calculated at initial project implementation and did not take account of final borehole distribution across VPAs, nor subsequent design change.
GS4203	10,000	19886.55	Estimated value was calculated at initial project implementation and did not take account of final borehole distribution across VPAs, nor subsequent design change.
GS6786	10,000	18691.99	Estimated value was calculated at initial project implementation and did not take account of final borehole distribution across VPAs, nor subsequent design change.
GS6787	10,000	18828.31	Estimated value was calculated at initial project implementation and did not take account of final borehole distribution across VPAs, nor subsequent design change.
GS6788	10,000	19193.85	Estimated value was calculated at initial project implementation and did not take account of final borehole distribution across VPAs, nor subsequent design change.
GS6789	10,000	19030.44	Estimated value was calculated at initial project implementation and did not take account of final borehole distribution across VPAs, nor subsequent design change.
GS6790	10,000	19967.25	Estimated value was calculated at initial project implementation and did not take account of final borehole distribution across VPAs, nor subsequent design change.

SECTION F. Stakeholder inputs and legal disputes

F.1. List all inputs/grievances which have been received for the project during the monitoring period together with their respective answers/actions

No inputs or grievances were received during the monitoring period.

F.2. List all inputs/grievances from previous monitoring period where follow up action is to be verified in this monitoring period

No inputs or grievances were received during the previous monitoring period.

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

No legal contests or disputes arose during the monitoring period.