Gold standard for the global goals
Monitoring report

June 2017, version 1

Title of the project	GS1247 Southern Ethiopia Community Boreholes
Gold Standard project id	VPA 86 - GS5322 VPA 87 - GS5323 VPA 88 - GS5324 VPA 127 - GS6037 VPA 128 - GS6038
Version number of the monitoring report	Version 1
Completion date of the monitoring report	20/05/2019
Date of project design certification	VPA 86-88 (02/11/2017) VPA 127-8 (28/12/2017)
Start date of crediting period	GS5322: 07/06/2017 GS5323: 10/06/2017 GS5324: 14/06/2017 GS6037: 22/06/2017 GS6038: 14/06/2017
Duration of this monitoring period	GS5322: 09/05/2018 to 08/05/2019 GS5323: 09/05/2018 to 08/05/2019 GS5324: 09/05/2018 to 08/05/2019 GS6037: 09/05/2018 to 08/05/2019 GS6038: 09/05/2018 to 08/05/2019
Duration of previous monitoring period	GS5322: 07/06/2017 to 08/05/2018 GS5323: 10/06/2017 to 08/05/2018 GS5324: 14/06/2017 to 08/05/2018 GS6037: 22/06/2017 to 08/05/2018 GS6038: 14/06/2017 to 08/05/2018
Project representative(s)	Emma Donnachie
Host Country	Ethiopia, Southern Nations, Nationalities and Peoples Region
Certification pathway (activity certification/impact certification)	Impact Certification
SDG Contributions targeted (as per approved PDD)	SDG3: Good Health and Wellbeing SDG5: Gender Equality SDG6: Clean Water and Sanitation SDG13: 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)	1 – SDG 3: 9,380 additional people consuming safe water 2 - SDG 5: 16.6% hours per household per day saved on firewood collection time 3 - SDG 6: 11,545 additional people gain access to safe water 4 – SDG 13: 10,000 tCO2e per VPA/ 50,000 tCO2e
Total amount of certified SDG impact (as per approved methodology) achieved in this monitoring period	1 – SDG 3: 8,298 additional people consuming safe water 2 - SDG 5: 16.9% reduced time on firewood collection time 3 - SDG 6: 12,765 additional people gain access to safe water 4 – SDG 13: 48,465 tCO2e

SECTION A. Description of project

A.1. Purpose and general description of project

>> (Provide a brief summary of the detailed description given in section B.1 including purpose of the project, brief description of the installed technology and equipment and relevant dates for the project (e.g. construction start/end, commissioning, continued operation periods, etc.)

This Micro-Scale VPA Southern Ethiopia Community Boreholes project is eligible under the Gold Standard methodology Technologies and Practices to Displace Decentralized Thermal Energy Consumption Version 1.0. The project will support the provision of safe water using borehole technology to hundreds of households within the Southern Nations, Nationalities and People's Region (SNNPR), Ethiopia. By providing safe water, the project will ensure that households consume less firewood during the process of water purification and as a result there shall be a reduction of carbon dioxide emissions from the combustion process.

The SNNPR is a largely rural district where 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 clean water desired by households.

Many existing boreholes are owned by community groups or community-based organizations (CBOs) and have fallen into disrepair because maintenance programmes have been poorly managed, or proven too expensive. In this project CO2balance will work with our project partner and community groups in SNNPR, Ethiopia to identify broken down boreholes and renovate them so that they deliver clean, safe water and breakdowns are fixed rapidly. The boreholes included under the project will be entirely human operated and will be fitted with hand pump models that are commonly used in the area, such as India Mark II pumps. The depth of the boreholes will be limited to 100m or less.

In total 25 boreholes were rehabilitated as part of this project between 06/06/2017 and 12/12/2017. The date, location and number of people served by each borehole are given in the table below, which forms the project database:

GS ID	Borehole ID	Village	Lat	Long	Date	No. HHs	No. People
GS5322	VGIF-01-001	Gera - Wucha	6° 16' .240"	37° 33' .957"	09/06/2017	138	631
	VGIF 01-003	Menhariya (Ezo Ketema)	6° 20' .974"	37° 35' .539"	15/06/2017	135	661
	VGIF 01-004	Yeduro Gebeya 02 (Ezo Ketema)	6° 21' .069"	37° 35' .585"	14/06/2017	147	695
	VGIF 01-006	Hayle	6° 15' .831"	37° 33' .954"	06/06/2017	125	677
	VGIF-02-014	Bantale Ber	6° 27' .961"	37° 45' .076"	30/08/2017	125	709
						Total	**3373**

GS ID	Borehole ID	Village	Lat	Long	Date	No. HHs	No. People
GS5323	VGIF-01-002	Lechare	6° 15' .580"	37° 33' .852"	10/06/2017	110	598
	VGIF-01-005	Haerba Hollo (Dorze Holo-o)	6° 13' .127"	37° 34' .229"	16/06/2017	66	287
	VGIF-01-008	Meda Sefer (Dorze 01)	6° 11' .724"	37° 34' .383"	09/06/2017	135	587
	VGIF-01-009	Afa Hayzo	6° 12' .365"	37° 34' .164"	16/06/2017	116	483
	VGSF-01-011	Gebeya (Dorze 01)	6° 11' .641"	37° 34' .471"	15/09/2017	400	1400
						Total	**3355**

GS ID	Borehole ID	Village	Lat	Long	Date	No. HHs	No. People
GS5324	VGIF-01-007	Sinsa Gitoia - Kinchaho	6° 15' .558"	37° 33' .150"	13/06/2017	66	424
	VGIF-01 - 012	Dorze Holo-o, Dolgalsa.	6° 14' .057"	37° 34' .527"	17/11/2017	120	574
	VGIF-01-014	Dorze Ayira	6° 13' .847"	37° 34' .894"	12/12/2017	155	541
	VGIF-02-003	Keme	6° 26' .589"	37° 44' .944"	17/06/2017	75	429
	VGIF-02-001	Algea Kebele Tima	6° 17' .157"	37° 47' .436"	16/06/2017	66	450
						Total	**2418**

GS ID	Borehole ID	Village	Lat	Long	Date	No. HHs	No. People
GS6037	VGIF-02-002	Algea (Kokale)	6° 16' .693"	37° 47' .571"	21/06/2017	62	308
	VGIF-02-004	Shayita	6° 17' .913"	37° 46' .168"	23/06/2017	88	507
	VGIF-02-007	M/eyesus	6° 09 59"	37° 39' 30"	18/07/2017	130	728
	VGIF-02-015	Dafa ber	6° 32' .160"	37° 48' .201"	31/08/2017	117	617
	VGIF-02-006	Umo Lante (Shola Sir)	6° 09 .654"	37° 39' .562"	20/07/2017	125	667
						Total	**2827**

GS ID	Borehole ID	Village	Lat	Long	Date	No. HHs	No. People
GS6038	VGIF-02-009	Kelateya	6° 26' .228"	37° 44' .755"	13/06/2017	125	684
	VGIF-02-012	Barber (Kow Ge Gibe)	6° 17' 48"	37° 46' 7"	05/07/2017	110	665
	VGIF-02-016	Hamasha	6° 22' .112"	37° 43 .591"	14/09/2017	64	386
	VGIF-02-017	Fura-budin 7/Uleta village	6° 10' .740"	37° 41 .289"	20/10/2017	73	358
	VGIF-02-011	Delbo (Tunkala ber)	6° 17' 28"	37° 45' 41"	11/07/2017	154	964
						Total	**3057**

The date of rehabilitation was confirmed by a Repair Confirmation Form which was signed by the mechanic carrying out the repair along with a village administrator from the local community. 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.

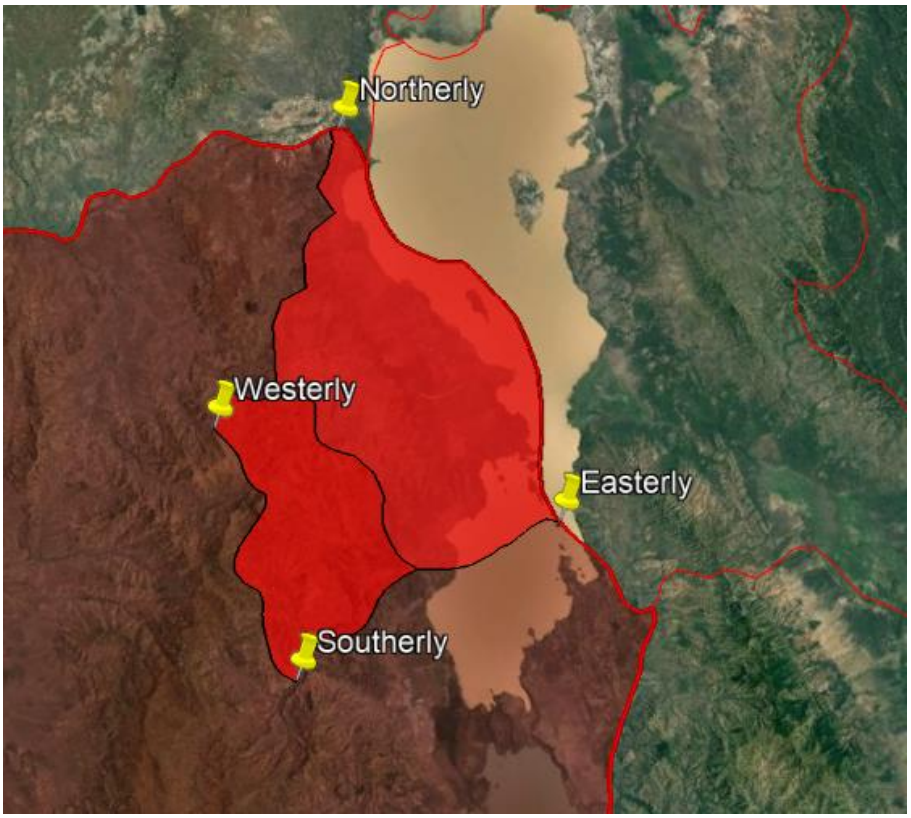
The number of days each borehole credited for in this monitoring period was multiplied by the number of people using the borehole to give the total number of project technology days for that borehole. The individual project technology days for each borehole were totaled to give the total number of project technology days for this monitoring period.

A.2. Location of project

>> (Provide host country, state/province, city/town details along with GPS co-ordinates.)

Below are details of the physical location to allow unique identification of the project. The Southern Nations, Nationalities and People's Region is marked in the red outline in the image below and the specific sub-districts are marked in red on the Google Earth image. The target area and the fuel collection area are defined as being contained within the project boundary, with the outer limits of the project boundary being clearly defined below, as the red and two smaller red regions on this Google Earth file. 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.


Mirab Abaya
Chencha


Northerly
Westerly
Easterly
Southerly

Project Area Coordinates		
	Latitude	Longitude
North	6.543464°	37.805167°
East	6.298847°	37.845369°
South	6.125352°	37.471529°
West	6.250965°	37.482652°

A.3. Reference of applied methodology

>>(Indicate title and version number of the methodology.)

This project utilises the Gold Standard Methodology 'Technologies and Practices to Displace Decentralized Thermal Energy Consumption V.01'.

A.4. Crediting period of project

>> (Provide start date and length of the crediting period as given in approved PDD.)

The date of rehabilitation was used as the start date of operation. It was conservatively assumed that the first day of crediting is not counted and the crediting period begins the following day after the borehole is rehabilitated. The length of the crediting period is 7 years, twice renewable as per the approved PDD.

The start dates for the projects crediting periods are as follows:

GS5322: 07/06/2017

GS5323: 10/06/2017

GS5324: 14/06/2017

GS6037: 22/06/2017

GS6038: 14/06/2017

SECTION B. Implementation of project

B.1. Description of implemented project

>> (Provide information on the implementation status of the project during this monitoring period. Specify any deviations / delays compared to information in approved project.)

CO2balance and Vita have rehabilitated 25 boreholes as part of these VPAs and all water points under the VPAs are in good working order and have been crediting since the beginning of their crediting period. All boreholes undergo annual water quality testing to ensure the water is safe for human consumption as per Ethiopian national water standards.

Furthermore, grievance expression process books placed at all water points have not received any feedback and Vita field staff have not received any feedback during this monitoring period from the borehole users on damage or breaking of boreholes therefore it can be assumed that the project is running as planned.

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

>> (Indicate whether any temporary deviations have been applied during this monitoring period. If applied, provide a description of the deviation(s). Include the reasons for the deviation(s), how it deviates from the monitoring plan, applied methodology(ies) and/or applied approaches, the duration for which the deviation(s) is(are) applicable

and justification on the conservativeness of the approach. Also indicate if prior approval from GS-TAC have been sought on the deviation.)

N/A

B.2.2. Corrections

>> (Indicate whether any corrections to project information or parameters fixed at validation have been applied.)

N/A

B.2.3. Changes to start date of crediting period

>> (Indicate whether any changes to the start date of the crediting period have been approved by Gold Standard that is relevant for this monitoring period.)

N/A

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

>> (Indicate whether any permanent changes from the approved monitoring plan, applied methodologies or applied approaches have been approved by GS-TAC that is relevant for this monitoring period.)

N/A

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.)

N/A

SECTION C. Description of monitoring system applied by the project

>>

All surveys are administered by trained CO2balance staff and in country partner NGO, Vita, 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. These are then sent to the UK head office for data analysis. The documentation procedure that CO2balance has devised ensures a minimum chance of original data being lost – all original copies of our project documentation are retained in the Ethiopian 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" (TPDDTEC), survey samples are randomly selected from the user record using a random sample group (RSG). A random number generator ranks the unique serial numbers of the boreholes in the project, generating the RSG which satisfies 90/30 precision. Each user in the RSG is assigned a unique random number from which survey participants are selected in accordance with the minimum sample size and confidence requirement for each survey. The RSG and survey participants are reselected for every monitoring period to ensure the selection remains random.

The surveys will be conducted to ensure that they are within the end date of the respective monitoring periods for each VPA.

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
- 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 installation record will be backed up electronically, with original documentation being stored in the appropriate office for the respective VPAs.

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

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

Ongoing Monitoring Studies

The following ongoing monitoring studies were conducted; the results are given in the parameter boxes tables in Section D.2.

- **Water Consumption Field Test (WCFT):** The WCFT is used to determine 3 key parameters: Qp,y – quantity of safe water in litres supplied in the project scenario using the clean water supply technology; Qp,rawboil,y – quantity of raw or unsafe water that is still boiled after installation of the water supply technology; Qp,cleanboil,y – quantity of safe water boiled in the project scenario after installation of the water supply technology. WCFT is completed biennially, prior to first verification and then every other year subsequently. The measurement method used is similar to the 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 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 co2balance UK Ltd.

- **Water Quality Test (WQT)**: The quality of the treated water will be assessed to ensure that it is fit for human consumption. It is assessed in accordance with Ethiopian national standards. The parameters used to assess the water quality will be in line with Ethiopian standards for potable water and all parameters will be shown to be within levels considered acceptable for domestic human consumption.

- **Usage Survey:** Usage Survey is used to determine the Up,y (usage rate in the project scenario p through year y) parameter. As all boreholes will be 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. The annual usage survey is conducted using a minimum sample size of 100

- **Project Survey** – Conducted annually to survey end users currently using project technologies to explore changes in project scenario over time. The annual project survey is conducted using a minimum sample size of 100. Data collected during the project surveys explores the following characteristics:

    - General information – Name, address, telephone number etc
    - Household socio-demographic information
    - Water use and purification characteristics
    - Sources and availability of fuel
    - Time use and time saved information

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

- **Project Technology Days (Np,y)-** Number of persons consuming water supplied by project scenario p through year y. Sum of the total number of people using each borehole in the project multiplied by the number of days crediting each borehole earns in this monitoring period. The total number of households using each borehole will be determined through information supplied by our NGO partner. Using this method, the total number of people using each borehole will be known and hence a figure for person days can be calculated. All monitoring tasks will be selected at random

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.

Cross Sampling

The project proponent has elected to cross-sample borehole technologies across all its homogenous VPAs located within the project area (VPA 86, 87, 88, 127, 128, 149, 150 and 156). Homogenous VPAs are defined as those that share a common baseline. The samples for the survey listed below are randomly selected from the borehole information databases in line with the minimum sample size requirements as defined by the methodology. Cross sampling will be applied to the following surveys;

- Project Surveys- Completed annually,
- Usage Surveys- Completed annually,
- Water Consumption Field Tests- Completed every two years.

Surveys are conducted through use of a Random Sample Group (RSG). The size of the sample group is selected so the number of boreholes to be sampled satisfies the 90/30 precision rule. A random number generator ranks the unique serial numbers of the boreholes in the project, generating a RSG. The sample group is reselected for every monitoring period to ensure the selection remains random. In this Monitoring Period, the minimum recommended sample size of the RSG to meet 90/30 precision was 7 boreholes. The individual participants surveyed from the RSG are selected at random from the project database using the same random number generator process, in accordance with the minimum sample size requirement for each survey, detailed in section D.3.

SECTION D. Data and parameters

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

Relevant SDG Indicator	SDG 13 (Climate Action)
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	Calculation of baseline emissions.
Additional comments	-

Relevant SDG Indicator	SDG 13 (Climate Action)
Data/parameter:	$EF_{b,non\ co2}$
Unit	tCO_2e/TJ
Description	Non-CO_2 (CH_4 and N_2O) emission factor arising from use of wood fuel in baseline scenario
Source of data	IPCC Default emissions factor
Value(s) applied)	8.692
Choice of data or measurement methods and procedures	Deemed valid by Methodology

Gas	Default Emissions factor (kg_gas/TJ_{NCV})	GWP of gas	Default Emissions factor (kg_CO_2e/TJ_{NCV})	Default Emissions factor (t_CO_2e/TJ_{NCV})
CH_4	300	25	7,500	7.5000
N_2O	4	298	1,192	1.1920
			Total	**8.692**

Purpose of data	Calculation of emission reductions.
Additional comments	-

Relevant SDG Indicator	SDG 13 (Climate Action)
Data/parameter:	$EF_{p,co2}$
Unit	tCO_2/TJ
Description	CO_2 emission factor arising from use of wood fuel in project scenario
Source of data	Volume 2: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 2, Table 2.5
Value(s) applied)	112
Choice of data or measurement methods and procedures	Deemed valid by Methodology.
Purpose of data	Calculation of emission reductions.
Additional comments	-

Relevant SDG Indicator	SDG 13 (Climate Action)
Data/parameter:	$EF_{p,non\ co2}$
Unit	tCO2e/TJ
Description	Non-CO2 (CH4 and N2O) emission factor arising from use of wood fuel in project scenario
Source of data	IPCC Default emissions factor
Value(s) applied)	8.692

Choice of data or measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculation of emission reductions.
Additional comments	-

Gas	Default Emissions factor (kg_gas/TJ_{NCV})	GWP of gas	Default Emissions factor (kg_CO_2e/TJ_{NCV})	Default Emissions factor (t_CO_2e/TJ_{NCV})
CH_4	300	25	7,500	7.5000
N_2O	4	298	1,192	1.1920
			Total	**8.692**

Relevant SDG Indicator	SDG 13 (Climate Action)
Data/parameter:	NCV_b
Unit	TJ/ton
Description	Net calorific value of the wood fuel used in the baseline
Source of data	IPCC Default emissions factor
Value(s) applied)	0.0156
Choice of data or measurement methods and procedures	Deemed valid by Methodology.
Purpose of data	Calculation of emission reductions.
Additional comments	-

Relevant SDG Indicator	SDG 13 (Climate Action)
Data/parameter:	NCV_p
Unit	TJ/ton
Description	Net calorific value of the wood fuel used in the project
Source of data	IPCC Default emissions factor
Value(s) applied)	0.0156
Choice of data or measurement methods and procedures	Deemed valid by Methodology.
Purpose of data	Calculation of emission reductions.
Additional comments	-

Relevant SDG Indicator	SDG 13 (Climate Action), SDG 6 (Clean Water and Sanitation)
Data/parameter:	$W_{b,y}$
Unit	T/litre
Description	Quantity of wood fuel that is used to treat 1 litre of water in the baseline scenario b during year y
Source of data	Baseline Water Boiling Test
Value(s) applied)	0.00127

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	Calculation of emission reductions.
Additional comments	-

Relevant SDG Indicator	SDG 13 (Climate Action), SDG 6 (Clean Water and Sanitation)
Data/parameter:	$W_{p,y}$
Unit	T/litre
Description	Quantity of wood fuel that is used to treat 1 litre of water in the project scenario p during year y
Source of data	Baseline Water Boiling Test
Value(s) applied)	0.00127
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	Calculation of emission reductions.
Additional comments	-

Relevant SDG Indicator	SDG 13 (Climate Action), SDG 6 (Safe Water and Sanitation)
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.
Value(s) applied)	15.07%
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. Deemed valid by Methodology.
Purpose of data	Calculation of emission reductions
Additional comments	-

Relevant SDG Indicator	SDG 13 (Climate Action)
Data/parameter:	Xboil Non Suppressed Demand
Unit	Percentage
Description	Percentage of premises that in the absence of the project activity would have used non-GHG emitting technologies like chlorine treatment techniques (if available) in the project boundary.
Source of data	Baseline study. Credible literature, studies, survey, reports, relevant to the project target area

Value(s) applied)	10.60%
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 outlined in annex 2. A fixed suppressed demand baseline has been opted for, however, in the event the project surveys show a substantial change in fuel use characteristics, a new baseline shall be conducted.
Purpose of data	Calculation of emission reductions.
Additional comments	-

Relevant SDG Indicator	SDG 5 (Gender Equality)
Data/parameter:	$T_{b,y}$
Unit	Hours
Description	Time spent collecting firewood per household per day prior to project
Source of data	Baseline survey
Value(s) applied)	3.02
Choice of data or measurement methods and procedures	Measured by question in the baseline survey.
Purpose of data	Calculating time saved collecting water by project.
Additional comments	-

D.2. Data and parameters monitored

Relevant SDG Indicator	SDG 13 (Climate Action)
Data/parameter:	$fNRB_{i,y}$
Unit	Fractional non-renewability
Description	Non-renewability status of woody biomass fuel in scenario i during year y
Source of data	CDM Default stated in following document: https://cdm.unfccc.int/DNA/fNRB/index.html
Value(s) applied)	0.88
Choice of data or measurement methods and procedures	The UNFCCC CDM default fNRB value for the Federal Democratic Republic of Ethiopia expired in April 2017. In absence of an updated value, the previously approved value shall be used, however this will be updated once a revised figure is put forward for the CDM default value. If the UNFCCC updated value is higher than the previously approved value, then the previously approved value shall be used. In other circumstances, the updated value by the UNFCCC shall be used, maintaining conservativeness.
Purpose of data	Calculation of emission reductions.
Additional comments	-

Relevant SDG Indicator	SDG 13 (Climate Action), SDG 6 (Safe Water and Sanitation)
Data/parameter:	$N_{p,y}$
Unit	Project Technology Days

Description	Number of persons consuming water supplied by project scenario p through year y
Measured/calculated/default	N/A
Source of data	Borehole Project Database
Value(s) of monitored parameter	GS5322 – 1,231,145 GS5323 – 1,224,575 GS5324 – 882,570 GS6037 – 1,031,855 GS6038 – 1,115,805
Monitoring equipment	Project Database
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Sum of the total number of people using each borehole in the project multiplied by the number of days crediting each borehole earns in a given monitoring period.
QA/QC procedures:	N/A
Purpose of data:	Calculation of emission reductions.
Additional comments:	-

Relevant SDG Indicator	SDG 13 (Climate Action), SDG 6 (Safe Water and Sanitation), SDG 3 (Good Health and Well-Being)
Data/parameter:	$U_{p,y}$
Unit	Percentage
Description	Usage rate in project scenario p through year y
Measured/calculated/default	N/A
Source of data	Usage Survey
Value(s) of monitored parameter	100%
Monitoring equipment	Usage Survey
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	The usage survey has been carried out by trained local staff 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 CO2balance UK Ltd.
QA/QC procedures:	N/A
Purpose of data:	Calculation of usage.
Additional comments:	-

Relevant SDG Indicator	SDG 13 (Climate Action), SDG 6 (Safe Water and Sanitation)
Data/parameter:	$Q_{p,y}$
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	*7.5*
Source of data	Water Consumption Field Test (WCFT)
Value(s) of monitored parameter	*7.5*

Monitoring equipment	WCFT Survey
Measuring/reading/recording frequency:	Completed every two years
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. Volume is capped at 7.5 litres per person per day as per the methodology. The WCFT will be carried out by trained local staff 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 CO2balance UK Ltd.
QA/QC procedures:	N/A
Purpose of data:	Calculation of emission reductions.
Additional comments:	-

Relevant SDG Indicator	SDG 13 (Climate Action), SDG 6 (Safe Water and Sanitation)
Data/parameter:	$Q_{p,cleanboil,y}$
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	N/A
Source of data	Water Consumption Field Test (WCFT)
Value(s) of monitored parameter	0
Monitoring equipment	WCFT Survey
Measuring/reading/recording frequency:	Completed every two years
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 trained local staff 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 CO2balance UK Ltd.
QA/QC procedures:	N/A
Purpose of data:	Calculation of emission reductions.
Additional comments:	-

Relevant SDG Indicator	SDG 13 (Climate Action)
Data/parameter:	$Q_{p,rawboil,\ y}$
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	N/A
Source of data	Water Consumption Field Test (WCFT)
Value(s) of monitored parameter	0
Monitoring equipment	WCFT Survey
Measuring/reading/recording frequency:	Completed every two years

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 trained local staff 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 CO2balance UK Ltd.
QA/QC procedures:	N/A
Purpose of data:	Calculation of emission reductions.
Additional comments:	-

Relevant SDG Indicator	SDG 6 (Safe Water and Sanitation)
Data/parameter:	Quality of Treated Water
Unit	Parameters as per national standards
Description	Performance of the treatment technology
Measured/calculated/default	N/A
Source of data	Laboratory Tests
Value(s) of monitored parameter	Pass
Monitoring equipment	Laboratory equipment
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	The Water and Irrigation Development Bureau has certified each water supply is in line with national standards.
QA/QC procedures:	N/A
Purpose of data:	To test water quality for safety of human consumption.
Additional comments:	-

Relevant SDG Indicator	SDG 13 (Climate Action)
Data/parameter:	$LE_{p,y}$
Unit	tCO2e per year
Description	Leakage in project scenario p during year y
Measured/calculated/default	0
Source of data	Baseline and Monitoring surveys
Value(s) of monitored parameter	0
Monitoring equipment	Desk based research
Measuring/reading/recording frequency:	Completed every two years
Calculation method (if applicable):	Assessed every two years using baseline and monitoring surveys.
QA/QC procedures:	N/A
Purpose of data:	Calculation of leakage.
Additional comments:	-

Relevant SDG Indicator	SDG 5 (Gender Equality)
Data/parameter:	$TP_{,y}$
Unit	hours
Description	Project time spent collecting firewood per household per day (hours)
Measured/calculated/default	0
Source of data	Project Survey
Value(s) of monitored parameter	2.51
Monitoring equipment	Project Survey
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Assessed every year using Project Survey
QA/QC procedures:	N/A
Purpose of data:	Calculation of SDG 5
Additional comments:	-

Relevant SDG Indicator	SDG 6 (Clean Water and Sanitation), SDG 3 (Good Health and Well-Being)
Data/parameter:	P,y
Unit	Number of people
Description	Number of persons having access to a safe water point in the project activity
Measured/calculated/default	0
Source of data	Project Database
Value(s) of monitored parameter	GS5322 - 3373 GS5323 - 3355 GS5324 - 2418 GS6037 - 2827 GS6038 - 3057
Monitoring equipment	Project Database/Household list
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Assessed every year using Project Survey, Usage Survey and Household list
QA/QC procedures:	N/A
Purpose of data:	Calculation of SDG 6 and SDG 3
Additional comments:	-

D.3. Implementation of sampling plan

>> (If data and parameters monitored described in section D.2 above are determined by a sampling approach, provide a description on how project participants implemented the sampling plan and surveys for those data and parameters according to the approved PDD.)

Surveys were conducted through use of a Random Sample Group (RSG) in accordance with 90/30 precision. The individual participants surveyed from the RSG were selected at random from the project database, in

accordance with the methodology's minimum sample size requirement for each survey, as detailed in Section D.3.1, D.3.2, and D.3.3 below.

D.3.1 Water Consumption Field Test

The Water Consumption Field Test was carried out on a randomly selected sample of 40 households from the project database. This complies with the recommended minimum sample size of 30 in the Gold Standard requirements. Furthermore, the sample confidence interval is within 10% of the mean.

Between 8-12 staff carried out the test over a period of four days (1 day preparation and 3 days measurement) following a similar method as the Kitchen Performance Test, and all tests were conducted between 18/04/2018 – 21/04/2018. The total litres of water consumed each day was measured and divided by the number of people consuming water in that day – this measurement was repeated over 3 consecutive days and an overall average per household was calculated. The results showed that on average 8.85 litres of non boiled clean water used only for drinking, hand washing and food preparation (capped at 7.5l) and 0 litres of boiled clean water is consumed per person per day.

The total amount of water credited for in this monitoring period is equal to the average amount of clean non-boiled water consumed per person per day (7.5l), minus the average amount of boiled clean water consumed per person per day (0).

As the WCFT is carried out biennially, it was not conducted during this monitoring period.

D.3.2 Usage Survey

The usage survey establishes the proportion of beneficiaries that use the boreholes, a key parameter in the emission reduction calculations. As all the boreholes were 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 are not necessary. Therefore, the annual usage survey has been conducted using a minimum sample size of 100.

The usage surveys in this monitoring period were carried out by field staff between the 10/04/19 – 13/04/19. The households that participated in the survey were randomly selected from the borehole user lists. The results confirmed that 100% of the respondents and their family members use the boreholes that were rehabilitated by Vita.

D.3.3 Project Survey

Project surveys were conducted by 2-3 staff between 10/04/19 – 13/04/19 on 100 randomly selected households from across the VPAs in Chencha and Mirab Abaya, to explore changes in the project scenario demographics, water use and purification practices etc) over time.

Data collected during the project surveys includes the following:

- General information - Name, address, telephone number etc.
- Household socio-demographic information.
- Water use and purification characteristics.
- Sources and availability of fuel.
- Time use and time saved information

SECTION E. Calculation of SDG outcomes

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

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

Details of equations and indicators used to estimate baseline values for SDG outcomes are explained below.

SDG 3 (Good Health and Wellbeing):

The outcome for SDG 3 is quantified as the additional number of persons consuming safe water in the project activity compared to the baseline scenario (P_{safe}). The percentage of users who were already consuming safe water in the baseline without boiling it (C_j) is determined through the baseline survey and deducted. Additionally, the percentage of users who consumed safe water by boiling it in the baseline ($P_{b,\,boil}$) is deducted. The baseline indicators are detailed in Section D.1 and are as follows:

C_j	Expressed as a percentage, the portion of users of the project technology j who in the baseline were already consuming safe water without boiling it.
$P_{b,\,boil}$	Percentage of persons boiling water for purification in the baseline scenario.

SDG 5 (Gender Equality):

The average % decrease per household in time spent gathering firewood ($T_{b,y}$) will be taken as a proxy contribution towards the SDG target. The baseline parameter for time spent collecting firewood per household per day is monitored in the baseline project survey. The baseline indicators are detailed in Section D.1 and are as follows:

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

SDG 6 (Clean Water and Sanitation):

The outcome for SDG 6 is quantified as the additional number of persons having access to safe water in the project activity compared to the baseline scenario. The percentage of users who were already consuming safe water in the baseline without boiling it (C_j) was determined through the baseline survey. The baseline indicators are detailed in Section D.1 and are as follows:

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)

CO2 emission reductions are the indicator to demonstrate that the project has raised capacity for effective climate change-related planning and management. This outcome is measured using the emission reduction calculations. The baseline indicators are detailed in Section D.1 and are as follows:

Baseline Emissions:

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

Where:

$$B_{p,y} = (1 - C_j) * N_{j,y} * W_{i,y} * (Q_{j,y} + Q_{j,rawboil,y}) \quad (11)$$

Where:

$N_{j,y}$	Number of person.days consuming water supplied by project scenario p through year y[47]
C_j	Expressed as a percentage, this is the portion of users of the project technology j who in the baseline were already consuming safe water without boiling it
$B_{b,y}$	Quantity of fuel consumed in baseline scenario b during the year y in tons
$Q_{p,y}$	Quantity of safe water in litres consumed in the project scenario p and supplied by project technology per person per day
$Q_{p,rawboil,y}$	Quantity of raw water boiled in the project scenario p per person per day
$W_{b,y}$	Quantity of fuel in tons required to treat 1 litre of water using technologies representative of baseline scenario b during project year y, as per Baseline Water Boiling Test.

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.*)

Details of equations used to calculate project value for SDG outcomes appear below. Calculation is provided in the corresponding Emission Reductions calculations in the 'SDG Calculations' Sheet and shown in section E.3.

Outcomes for SDG 3 (Good Health and Wellbeing):

The VPAs are premised on generating Emission Reductions by ensuring that water point users have safe water, thereby removing the need for them to burn non-renewable biomass in order to boil water to purify it. Emission reductions are also claimed through the principle of suppressed demand, meaning that some users lacked the resources, time or information necessary to purify their water prior to the project. Therefore, the users for whom ERs are claimed through suppressed demand were forced to use unsafe water for drinking, food preparation and basic personal hygiene prior to the project.

This usage of unsafe water can be taken as a proxy cause of Disability Adjusted Life Years (DALYs) in Ethiopia, as using unsafe water is deemed a significant cause of illness and death in the country.

The outcome for SDG 3 is quantified as the additional number of persons consuming safe water in the project activity compared to the baseline scenario (P_{safe}). Calculations are as follows:

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

Where:

P_{safe}	Number of additional persons consuming safe water in the project activity compared to the baseline scenario.
P_y	Number of persons having access to safe water in the project activity.
C_j	Expressed as a percentage, the portion of users of the project technology j who in the baseline were already consuming safe water without boiling it.
$P_{b,\,boil}$	Percentage of persons boiling water for purification in the baseline scenario.

Outcomes for SDG 5 (Gender Equality):

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

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

Where:

TR_y Total reduction time spent collecting firewood for project activity in year y (%)

$T_{b,y}$ Baseline time spent collecting firewood per household per day (hours)

$T_{p,y}$ Project time spent collecting firewood per household per day (hours)

Outcomes for SDG 6 (Clean Water and Sanitation):

The outcome for SDG 6 is quantified as the additional number of persons having access to safe water in the project activity compared to the baseline scenario. Calculations are as follows:

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

Where:

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

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

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

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

Outcomes for SDG 13 (Climate Action):

CO2e emission reductions are the indicator to demonstrate that the project has raised capacity for effective climate change-related planning and management contributing to SDG 13. The overall reduction in CO2 emission reductions is calculated as follows:

$$ERy = ((BEb,y - PEp,y) * Up,y - LEp,y)*(1-Xboil)$$

Where:

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

And:

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

Where

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

And:

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

Where:

$BE_{b,y}$ Baseline emissions in baseline scenario b per year y

$PE_{p,y}$ Project emissions in project scenario p per year y

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

$LE_{p,y}$ Leakage in project scenario p during year y

X_{boil} Expressed as a percentage, the portion of premises that in the absence of the project activity would have used non-GHG emitting technologies if they were available in the project boundary

The emissions reductions for the current monitoring period can be found in the corresponding Emission Reductions Calculations spreadsheet.

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

Detailed calculations are provided in the corresponding Emission Reductions Calculations in the 'SDG Calculations' Sheet.

GS 5322:

SDG	Calculation	Net Benefit
GS5322		
SDG 3	$P_{safe} = P_y * (1 - C_j) * (1 - P_{b,boil})$ $P_{safe} =$ 3373 * (1 – 0.1507) * (1 – 0.35) = 1862	1862 additional people consuming safe water in the project activity.
SDG 5	$TR_y = (T_{b,y} - T_{p,y}) / T_{b,y}$ TRy= (3.02 – 2.51) / 3.02 = 16.9%	A 16.9% decrease in time spent collecting firewood
SDG 6	$P_{access} = P_y * (1 - C_j) * U_{p,y}$ P_{access} = 3373 * (1-0.1507) * 1 = 2865	2865 additional people with access to safe water in the project activity.

SDG 13: Emission Reductions - 09/05/18 - 08/05/19

2018 Emission Reductions			
Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	10,759
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1.00
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	10,759
Suppressed Demand Assessment			
Percentage of suppressed demand users			89.40%
Percentage of **non**-suppressed demand users	Xboil	Percentage	10.60%
Emission Reductions	**ERy**	**tCO2/y**	**9618**
Capped ERs			

Capped Emission Reductions	**ERy**	**tCO2/y**	**6270**

2019 Emission Reductions			
Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	5,881
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1.00
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	5,881
Suppressed Demand Assessment			
Percentage of suppressed demand users			89.40%
Percentage of **non**-suppressed demand users	Xboil	Percentage	10.60%
Emission Reductions	**Ery**	**tCO2/y**	**5257**
Capped ERs			
Capped Emission Reductions	**ERy**	**tCO2/y**	**3534**

Total Capped ERs for MP2		
Emissions Reductions		
2018		**6270**
2019		**3534**
Total ERs for MP2		**9804**

GS 5323:

SDG	Calculation	Net Benefit
GS5323		
SDG 3	$P_{safe} = P_y * (1 - C_j) * (1 - P_{b,boil})$ P_{safe} = 3355 * (1 – 0.1507) * (1 – 0.35) = 1852	1852 additional people consuming safe water due to the project
SDG 5	$TR_y = (T_{b,y} - T_{p,y}) / T_{b,y}$ TRy= (3.02 – 2.51) / 3.02 = 16.9%	A 16.9% decrease in time spent collecting firewood
SDG 6	$P_{access} = P_y * (1 - C_j) * U_{p,y}$ P_{access} = 3355 * (1-0.1507) * 1 = 2849	2849 additional people with access to safe water due to the project

SDG 13: Emission Reductions - 09/05/18 - 08/05/19

2018 Emission Reductions			
Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	10,703
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	10,703
Suppressed Demand Assessment			
Percentage of suppressed demand users			89.40%
Percentage of **non**-suppressed demand users	Xboil	Percentage	10.60%
Emission Reductions	**ERy**	**tCO2/y**	**9568**
Capped ERs			
Capped Emission Reductions	**ERy**	**tCO2/y**	**6029**

2019 Emission Reductions			
Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	5,849
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	5,849
Suppressed Demand Assessment			
Percentage of suppressed demand users			89.40%
Percentage of **non**-suppressed demand users	Xboil	Percentage	10.60%
Emission Reductions	**Ery**	**tCO2/y**	**5229**
Capped ERs			
Capped Emission Reductions	**ERy**	**tCO2/y**	**3535**

Total ERs for MP2	
Emissions Reductions	
2018	**6029**
2019	**3,535**
Emission Reductions claimed for MP2	**9,564**

GS 5324:

SDG	Calculation	Net Benefit
GS5324		
SDG 3	$P_{safe} = P_y * (1 - C_j) * (1 - P_{b,boil})$ P_{safe} = 2418 * (1 – 0.1507) * (1 – 0.35) = 1335	1335 additional people consuming safe water due to the project
SDG 5	$TR_y = (T_{b,y} - T_{p,y}) / T_{b,y}$ TRy= (3.02 – 2.51) / 3.02 = 16.9%	A 16.9% decrease in time spent collecting firewood
SDG 6	$P_{access} = P_y * (1 - C_j) * U_{p,y}$ P_{access} = 2418 * (1- 0.1507) * 1 = 2054	2054 additional people with access to safe water due to the project

SDG 13: Emission Reductions - 09/05/18 - 08/05/19

2018 Emission Reductions			
Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	7,713
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1.00
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	7,713
Suppressed Demand Assessment			
Percentage of suppressed demand users			89.40%
Percentage of **non**-suppressed demand users	Xboil	Percentage	10.60%
Emission Reductions	**ERy**	**tCO2/y**	**6895**
Capped ERs			
Capped Emission Reductions	**ERy**	**tCO2/y**	**6256**

2019 Emission Reductions			
Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	4,216
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1.00
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	4,216
Suppressed Demand Assessment			
Percentage of suppressed demand users			89.40%
Percentage of **non**-suppressed demand users	Xboil	Percentage	10.60%
Emission Reductions	**Ery**	**tCO2/y**	**3769**
Capped ERs			
Capped Emission Reductions	**ERy**	**tCO2/y**	**3534**

Total Capped ERs for MP2		
Emissions Reductions		
2018		**6256**
2019		**3534**
Total ERs for MP2		**9790**

GS 6037:

SDG	Calculation	Net Benefit
GS6037		
SDG 3	$P_{safe} = P_y * (1 - C_j) * (1 - P_{b,boil})$ P_{safe} = 2827 * (1 – 0.1507) * (1 – 0.35) = 1561	1561 additional people consuming safe water due to the project
SDG 5	$TR_y = (T_{b,y} - T_{p,y}) / T_{b,y}$ TRy= (3.02 – 2.51) / 3.02 = 16.9%	A 16.9% decrease in time spent collecting firewood
SDG 6	$P_{access} = P_y * (1 - C_j) * U_{p,y}$ P_{access} = 2827 * (1- 0.1507) * 1 = 2401	2401 additional people with access to safe water due to the project

SDG 13: Emission Reductions - 09/05/18 - 08/05/19

2018 Emission Reductions			
Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	9,018
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1.00
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	9,018
Suppressed Demand Assessment			
Percentage of suppressed demand users			89.40%
Percentage of **non**-suppressed demand users	Xboil	Percentage	10.60%
Emission Reductions	**ERy**	**tCO2/y**	**8062**
Capped ERs			
Capped Emission Reductions	**ERy**	**tCO2/y**	**6183**

2019 Emission Reductions			
Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	4,929
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1.00
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	4,929
Suppressed Demand Assessment			
Percentage of suppressed demand users			89.40%
Percentage of **non**-suppressed demand users	Xboil	Percentage	10.60%
Emission Reductions	**Ery**	**tCO2/y**	**4406**
Capped ERs			
Capped Emission Reductions	**ERy**	**tCO2/y**	**3534**

Total Capped ERs for MP2
Emissions Reductions

2018		**6183**
2019		**3534**
Total ERs for MP2		**9717**

GS 6038:

SDG	Calculation	Net Benefit
GS6038		
SDG 3	$P_{safe} = P_y * (1 - C_j) * (1 - P_{b,boil})$ P_{safe} = 3057 * (1 – 0.1507) * (1 – 0.35) = 1688	1688 additional people consuming safe water due to the project
SDG 5	$TR_y = (T_{b,y} - T_{p,y}) / T_{b,y}$ TRy= (3.02 – 2.51) / 3.02 = 16.9%	A 16.9% decrease in time spent collecting firewood
SDG 6	$P_{access} = P_y * (1 - C_j) * U_{p,y}$ P_{access} = 3057 * (1- 0.1507) * 1 = 2596	2596 additional people with access to safe water due to the project

SDG 13: Emission Reductions - 09/05/18 - 08/05/19

2018 Emission Reductions			
Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	9,752
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1.00
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	9,752
Suppressed Demand Assessment			
Percentage of suppressed demand users			89.40%
Percentage of **non**-suppressed demand users	Xboil	Percentage	10.60%
Emission Reductions	**ERy**	**tCO2/y**	**8718**
Capped ERs			
Capped Emission Reductions	**ERy**	**tCO2/y**	**6056**

2019 Emission Reductions			
Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	5,330
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	1.00
Leakage	LEp,y	tCO2/y	0
Emission Reductions	Ery	tCO2/y	5,330
Suppressed Demand Assessment			
Percentage of suppressed demand users			89.40%

Percentage of **non**-suppressed demand users	Xboil	Percentage	10.60%
Emission Reductions	**Ery**	**tCO2/y**	**4765**
Capped ERs			
Capped Emission Reductions	**ERy**	**tCO2/y**	**3534**

Total Capped ERs for MP2		
Emissions Reductions		
2018		**6056**
2019		**3534**
Total ERs for MP2		**9590**

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	People consuming safe water: GS5322: 1511 GS5323: 1503 GS5324: 1083 GS6037: 1266 GS6038: 1369	People consuming safe water: GS5322: 3373 GS5323: 3355 GS5324: 2418 GS6037: 2827 GS6038: 3057	Additional people consuming safe water: GS5322: 1862 GS5323: 1852 GS5324: 1335 GS6037: 1561 GS6038: 1688
SDG 5	3.02 hours spent collecting firewood per household per day	2.51 hours spent collecting firewood per household per day	16.9% decrease in time spent collecting firewood
SDG 6	People with access to safe water: GS5322: 508 GS5323: 506 GS5324: 360 GS6037: 426 GS6038: 462	People with access to safe water: GS5322: 3373 GS5323: 3355 GS5324: 2418 GS6037: 2827 GS6038: 3057	Additional people with access to safe water: GS5322: 2865 GS5323: 2849 GS5324: 2054 GS6037: 2401 GS6038: 2596
SDG 13	Baseline emission estimate: GS5322: 10,000 tCO2e GS5323: 10,000 tCO2e GS5324: 10,000 tCO2e GS6037: 10,000 tCO2e GS6038: 10,000 tCO2e	Project emission estimate: GS5322: 0 tCO2e GS5323: 0 tCO2e GS5324: 0 tCO2e GS6037: 0 tCO2e GS6038: 0 tCO2e	Emission Reductions: GS5322: 9,804 tCO2e GS5323: 9,564 tCO2e GS5324: 9,790 tCO2e GS6037: 9,717 tCO2e GS6038: 9,590 tCO2e

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

Item	Values estimated in ex ante calculation of approved PDD	Actual values achieved during this monitoring period
SDG 3	GS5322: 1862 GS5323: 1852 GS5324: 1842 GS6037: 1896 GS6038: 1928 **Total: 9,380**	GS5322: 1862 GS5323: 1852 GS5324: 1335 GS6037: 1561 GS6038: 1688 **Total: 8,298**
SDG 5	At least 0.5 hours per trip per household time saved/ 16.6% reduction in time spent collecting firewood	Time spent collecting firewood has decreased during this monitoring period by 0.51 hours / 16.9%
SDG 6	GS5322: 2292 GS5323: 2280 GS5324: 2267 GS6037: 2333 GS6038: 2373 **Total: 11,545**	GS5322: 2865 GS5323: 2849 GS5324: 2054 GS6037: 2401 GS6038: 2596 **Total: 12,765**
SDG 13	GS5322: 10,000 tCO2e GS5323: 10,000 tCO2e GS5324: 10,000 tCO2e GS6037: 10,000 tCO2e GS6038: 10,000 tCO2e **Total: 50,000 tCO2e**	GS5322: 9,804 tCO2e GS5323: 9,564 tCO2e GS5324: 9,790 tCO2e GS6037: 9,717 tCO2e GS6038: 9,590 tCO2e **Total: 48,465 tCO2e**

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

>>

These projects were design certified prior to transition to Gold Standard for the Global Goals, hence all ex-ante estimates of SDG outcomes are derived from the relevant Transition Annex.

SDG 3: Estimates exceeds actual value. Estimates were calculated before the VPAs had been bundled, so user numbers for some VPAs was lower than estimated. All project participants now consume safe water without the need to boil. Participants are now experiencing less illnesses associated with consuming unsafe water.

SDG 5: Actual value slightly exceeds estimate. Time spent collecting firewood reduced by 0.51 hours in the project. This presents a 16.9% reduction in time spent collecting firewood compared to the baseline and slightly exceeds the ex-ante estimate of 0.5 hours time saving.

SDG 6: Actual value exceeds estimate. Estimates were conservatively based upon an 80% usage rate in the project scenario. However, in the current monitoring period, 100% of households collect their water from the boreholes rehabilitated as part of the project. As such, all project participants now have access to a reliable safe water source in the project.

SDG 13: Estimate exceeds actual value. To ensure that the cap of 10,000 emission reductions are claimed per VPA across any 365 day period, ERs have been capped at a daily rate, taking into account the ERs claimed in MP1. As such, ERs are slightly less than the 10,000 ER cap for MP2. Positive contributions to SDG13 have been achieved.

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 Stakeholder feedback or comments have been received during this 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 Stakeholder feedback or comments were received during previous monitoring period hence no follow up action has been taken during this monitoring period.

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

N/A