Monitoring Report

Title of the project activity	**Nazava Water Filter Project**
Gold Standard project id	GS4290
Version number of the PDD applicable to this monitoring report	3.0
Version number of this monitoring report	2.0
Completion date of this monitoring report	24/01/2019
Monitoring period number and duration of this monitoring period	Monitoring period number 1(MP1) 19/12/2015 to 18/12/2018
Project participants	PT Holland For Water
Host Party	Indonesia
Sectoral scopes and applied methodology(ies)	Sectoral Scope 3: “Energy demand” AMS-III.AV, version 04.0, Small-scale Methodology, “Low greenhouse gas emitting safe drinking water production systems"
Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period	28,879 tCO2e[1]
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	32,108 tCO2e[2]

[1] Nazava_MP1(2018)_ER_20190124, Tab ER&SD, Cell F9

[2] Based on PDD, page 24, the ER estimated from 19 Dec 2015 to 18 Dec 2018 can be calculated [(5,432/365)*13+7,440+10,452+(14,541/365)*352]

SECTION A. Description of project activity

A.1. General description of project activity

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The project owner PT Holland for Water is a social enterprise that distributes ceramic candle water filters across Indonesia, targeting low-income households (<$7/day) in rural and urban areas through a wide network of resellers or micro-entrepreneurs. The activity is the sale and distribution of Nazava water filtration technology in regions of Indonesia.

The applied technology is a ceramic water filter that produces water of safe drinking water quality. The project start date is defined on 09/11/2011. The carbon project was first developed by Impact Carbon since 2010. It was submitted to GS as a Voluntary Project Activity GS2443 in 2013. However, the ERPA between the project owner and Impact Carbon was terminated in 2014 while the project was under validation. Since 2015, the project owner has been cooperated with Nexus for continuing the validation process as a stand-alone project and it was finally registered on 15/02/2016. The project will continue its operation at least until the end of this crediting period of 29/02/2024.

A.2. Location of project activity

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Whole country of Indonesia. The geographic coordinates of Indonesia3 is as below:
Latitude: 5 00 S
Longitude: 120 00 E

The geographic coordinates of the project factory is as below:
Latitude: 6.8658 S,
Longitude: 107.543406 E

[3] https://www.cia.gov/library/publications/the-world-factbook/geos/id.html

Figure 1. Indonesia geographic and project factory location in Bandung, Java

A.3. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Indonesia	PT Holland For Water	NO

A.4. Reference to applied methodologies and standardized baselines

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Methodology:

AMS-III.AV, version 04.0, Small-scale Methodology, “Low greenhouse gas emitting safe drinking water production systems"

A.5. Crediting period type and duration

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Start date of crediting period was 01/03/2014 with a fixed length of 10 years (01/03/2014 to 29/02/2024)

SECTION B. Implementation of project activity

B.1. Description of implemented project activity

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The project sold 87,879 Ceramic Water Filters (CWFs) up to 18/12/2018 (see Table 1) and reduced 32,897 tonnes[4] of GHG emissions (tCO2e). During that period, PP has been monitoring closely all the activities required by the monitoring plan registered in PDD.

This project is an end-use energy efficiency improvement project, registered under the Sectoral scope 3 of CDM: “Energy demand” Applied methodology AMS III.AV version 4.0

The project has been implemented as described in the PDD in section A.4.2. The technology used during this monitoring period is the same as described in the PDD. There has been no change in the technology.

Project Activities

The starting date of operation of the project activity was 09/11/2011, when the first purchased of PTH’s water filters was made.

The Ceramic Water Filters are sold throughout the Indonesia, as outlined in Section A.2, and are not all installed at the start of the project but are installed progressively during the 10-year crediting period. Below Table 1 illustrates the sale rate per month from 01/12/2011 to 18/12/2018.

Table 1. Number of CWFs sold per month

Date	Sold CWFs[5]	Cumulative number of Sold CWFs
Dec 2011	248	248
Jan 2012	580	828
Feb 2012	920	1,748
Mar 2012	345	2,093
Apr 2012	224	2,317
May 2012	448	2,765
Jun 2012	305	3,070
Jul 2012	184	3,254
Aug 2012	155	3,409

[4] Nazava_MP1(2018)_ER_20190124, Tab ER&SD, Cell F9

[5] Nazava_MP1(2018)_SaleData, Tab Summary_Sale *(Note: sale data is updated up to 18 Dec 2018).*

Date	Sold CWFs[5]	Cumulative number of Sold CWFs
Sep 2012	272	3,681
Oct 2012	713	4,394
Nov 2012	560	4,954
Dec 2012	263	5,217
Jan 2013	459	5,676
Feb 2013	153	5,829
Mar 2013	378	6,207
Apr 2013	451	6,658
May 2013	268	6,926
Jun 2013	703	7,629
Jul 2013	1,023	8,652
Aug 2013	709	9,361
Sep 2013	582	9,943
Oct 2013	406	10,349
Nov 2013	437	10,786
Dec 2013	2,596	13,382
Jan 2014	500	13,882
Feb 2014	2,850	16,732
Mar 2014	1,941	18,673
Apr 2014	1,195	19,868
May 2014	268	20,136
Jun 2014	510	20,646
Jul 2014	88	20,734
Aug 2014	414	21,148
Sep 2014	97	21,245
Oct 2014	44	21,289
Nov 2014	346	21,635
Dec 2014	280	21,915
Jan 2015	794	22,709
Feb 2015	387	23,096
Mar 2015	744	23,840
Apr 2015	1,167	25,007
May 2015	807	25,814
Jun 2015	488	26,302
Jul 2015	552	26,854
Aug 2015	1,147	28,001
Sep 2015	779	28,780
Oct 2015	587	29,367
Nov 2015	831	30,198
Dec 2015	480	30,678
Jan 2016	718	31,396
Feb 2016	1,141	32,537
Mar 2016	2,818	35,355
Apr 2016	3,830	39,185
May 2016	1,647	40,832

Date	Sold CWFs[5]	Cumulative number of Sold CWFs
Jun 2016	1,005	41,837
Jul 2016	254	42,091
Aug 2016	1,096	43,187
Sep 2016	2,141	45,328
Oct 2016	857	46,185
Nov 2016	806	46,991
Dec 2016	1,906	48,897
Jan 2017	1,491	50,388
Feb 2017	265	50,653
Mar 2017	884	51,537
Apr 2017	1,176	52,713
May 2017	868	53,581
Jun 2017	191	53,772
Jul 2017	206	53,978
Aug 2017	789	54,767
Sep 2017	1,437	56,204
Oct 2017	2,952	59,156
Nov 2017	1,270	60,426
Dec 2017	1,769	62,195
Jan 2018	425	62,620
Feb 2018	897	63,517
Mar 2018	798	64,315
Apr 2018	354	64,669
May 2018	312	64,981
Jun 2018	446	65,427
Jul 2018	403	65,830
Aug 2018	3,066	68,896
Sep 2018	4,740	73,636
Oct 2018	5,302	78,938
Nov 2018	4,999	83,937
Dec 2018[6]	3,942	87,879
Total	87,879	

During this monitoring period, Nazava produced/assembled all the filters at their purpose-built factory in Indonesia. Local production using locally available skills has continued to provide low-cost production while providing gainful employment to local people.

As described in PDD, PTH's core product is the Tulip, a ceramic filter candle that is mixed with colloidal silver and filled with activated carbon. The water filter candles are imported from Basic Water Needs (BWN). BWN is widely recognized for its impact in developing, producing and distributing water purification and conservation products; creating access to safe drinking water for everyone. After the filters are assembled and checked for quality at the Nazava's factory, they are distributed through different market channels. Water from a PTH's water filter is estimated to be six to nine times more economic than boiling water[7].

[6] Up to 18 December 2018.

[7] http://kopernik.info/sites/default/files/instructions/Nazava%20more%20info_0_0.pdf

Ceramic filter
The filters are made of diatomaceous earth with pores of 0.4 micron (0.0004 milimeter) and remove micro-organisms: bacteria, cysts, parasites, fungi, sand, clay and other particles greater than 0.4 micron[8].

Activated Carbon
The ceramic is filled with activated carbon which reduces the content of harmful chemicals such as pesticides and chlorine. It improves the taste and reduces smell.

Anti-microbial Silver
The ceramic is impregnated with silver (0.08 % by weight), which kills micro-organisms like bacteria that are trapped at the surface of the ceramic. The silver content is very low and not harmful for frequent use[9].

Figure 2: Tulip filter

PTH's filters are ceramic filters that remove microorganisms such as bacteria, fungi, sand, clay and other particles greater than 0.4 micron. PTH's water filter technologies conservatively purifies 3 litres per hour[10], is certified to last for 7,000 litres[11]

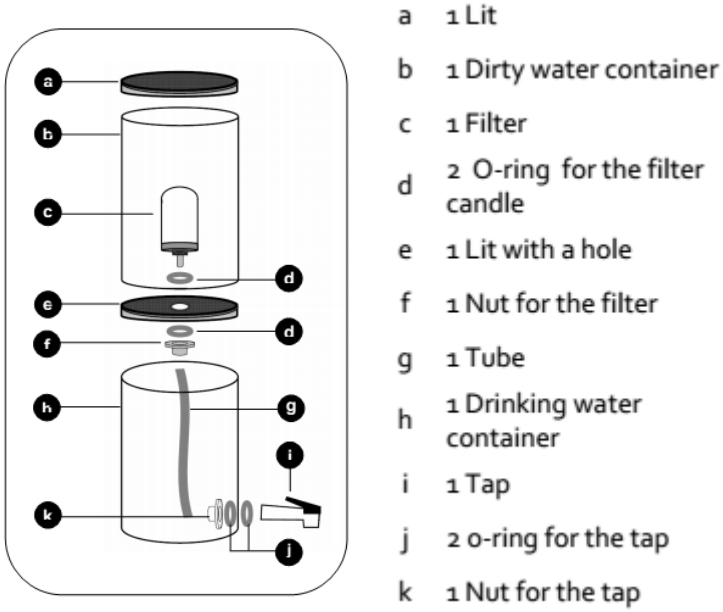

Figure 3: PTH's water filters technology

Using this technology, households can filter their own tap, well, river or rain water. All of these filters come with an Indonesian-language user manual with clear directions, an indicator for filter replacement, and a one-year warranty card. Tulip ceramic water filter has been one of the

[8] http://www.nazava.com/english/nazava_filter_solution.php

[9] http://www.nazava.com/english/nazava_filter_solution.php

[10] http://www.basicwaterneeds.com

[11] http://www.basicwaterneeds.com/wp-content/uploads/qaqc/Netherlands/Netherlands/Netherlands%20Waterlab%20Noord%20Analysis.pdf

solutions for providing safe drinking water.[12] They have been shown to effectively reduce diarrhoea diseases, with independent tests and assessments available.[13]

PTH provides customers[14] with household drinking water purification systems and well water treatment options. The core product of PTH is a high quality ceramic water filter element, which is used in 18 different water filter housings. The water filter housings come in a broad range of different shapes and capacity, answering to different needs and demand among different income groups in society. There are 2 types of housings; with and without tap. The main model is a table top which has an upper container to collect the dirty water and a lower container with a tap for the drinking water. The Rapido models are consisting of one container with a filter inside and a tube which is used to fill jerry cans or 19L water bottles that are used on water dispensers.

Figure 4: PTH's water filters products

Regarding the distribution of the project technology (CWFs), Nazava has maintained a total sales record of all sales through three main channels:
i) Direct sales to end users by Nazava sales staff or online
ii) Indirect Sales from retailers
iii) NGOs and variety of community development projects that purchase wholesale CWFs for distribution to their project beneficiaries.

For direct sales, Nazava sells either through door-to-door sales, through office walk-ins or through holding meetings to share with interested communities the potential benefits of the CWF. For indirect sale, Nazava sell CWFs to many retailers across the country. Nazava also sells the filters to NGOs wishing to distribute or sell the CWPs at subsidized rates. Additionally, throughout the monitoring period, Nazava has maintained a user database containing the contact details of all end users, to the extent possible.

[12] http://www.who.int/household_water/resources/2012WorldWaterForumReport.pdf

[13] There are some independent assessments available: Thunderbird School of Management: http://knowledgenetwork.thunderbird.edu/tem-indonesia-kopernik-7_11/2011/08/01/how-can-a-water-filter-make-a-difference/ ; the effectiveness of the bacterial removal of the Nazava water filter: http://nazava.com/english/docs/labnoord.pdf ; other international test reports: http://nazava.com/english/nazavaWaterFiltersTestResults.php

[14] Besides households, PTH's customers could be communities or institutions. However, for simplifying the baseline and ensuring conservative (less users for household users than communities or institutions), all customers are considered as households.

Monitoring work

From September to November 2018, Nazava has conducting monitoring survey and water quality survey test to accurately calculate the monitoring parameters outlined in the Project Design Document and Gold Standard Passport.

Nazava has implemented ongoing monitoring of sales, end-user contact details, water quality and usage rates. The sales database records monthly sales of the CWFs and the user database records end-user information, when feasible. Nazava has monitored the usage rates of the CWFs through the usage survey to ensure the project claims an appropriate useful life of the technology. End-users can replace broken parts or the entire unit at no cost through a 2-year warranty system. This system extends the lifespan of the CWF by providing a warranty with the information necessary to replace broken parts or units detailed within the sales receipt or as a Warranty Card provided with the unit. End-users are also provided with detailed instructions outlining the proper care and maintenance of the filter.

Nazava has also fully implemented the actions mitigating against double counting as outlined in the PDD, including:

1. Nazava has added a serial number to all water filters produced and kept the numbers in a database; and
2. The design of the water filters from Nazava look physically different from other water filters in the market, making it easy to recognize them.

B.2. Post-registration changes

B.2.1. Temporary deviations from the registered monitoring plan, applied methodologies or standardized baselines

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During this monitoring period, PP has made deviation request for (1) extending monitoring period and (2) using mobile test kit for conducting water quality test. The details the request and approval from GS-TAC can be found in the file named “Deviation Request_form_GS4290_GS_Nexus FINAL”.

B.2.2. Corrections

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Xboil factor is updated. The new figure is 88.26% which is estimated based on the result of this monitoring survey. The previous Xboil factor (70.1%) was the ex-ante assumption and it was updated using the result from the monitoring survey conducted in November 2018.

B.2.3. Changes to the start date of the crediting period

>>NA

B.2.4. Inclusion of monitoring plan

>>NA

B.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools

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As mentioned in the GS-TAC approval above, Water quality test is now approved to be conducted by the project participant by using mobile test kits instead of using the third-party laboratory.

B.2.6. Changes to project design

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As agreed in the GS-TAC decision above, the project can extend its crediting period for a maximum of 3 years prior to verification site visit date for which data can be verified. The site visit from DoE is starting from 19/12/2018. So, the monitoring period is from 19/12/2015 to 18/12/2018.

SECTION C. Description of monitoring system

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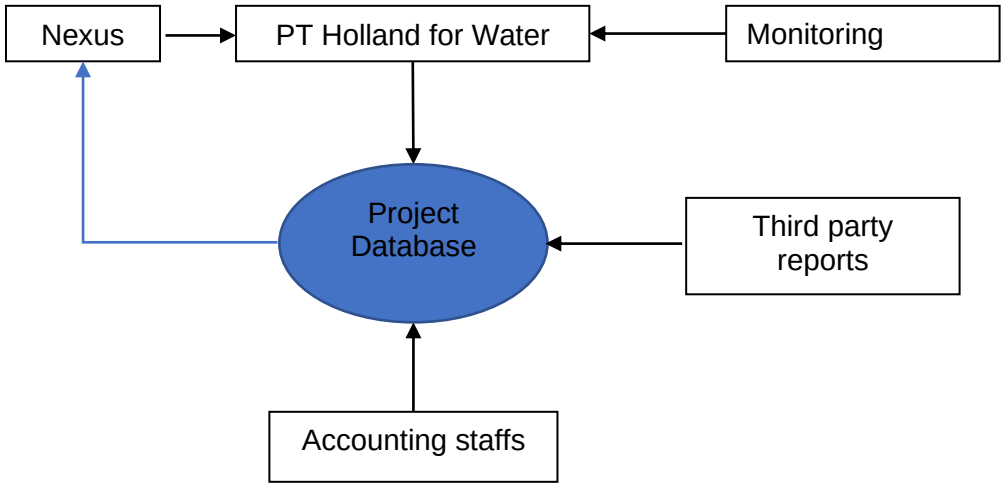
As described in its registered PDD, the monitoring system has been implemented as described below.

Monitoring organization

The structure of the monitoring group is as follows:



Structure of the monitoring group

The responsibilities of each person involved are elaborated as follows:

Group members and their responsibilities

Entity	Responsibility
Nexus	• Consultant, prepare sampling plan, • Verify the monitoring work done to ensure accuracy before submission, spot check data • Prepare the monitoring report • Contacting VVB • Sell carbon credit.
PT Holland for Water	• Implement project • Manages the Project Database, in which the results of monitoring shall be summarized. • Collecting data to be monitored accurately, or training Field Measurement Personnel to do so. • Sharing monitoring data with Nexus. • Maintains proper and continuous records of project activities and disseminated technologies, including product identification • Oversees maintenance of installed systems
Accounting staffs	• Insert sales records to database.
Monitoring agents	• Conduct on the ground monitoring of end users

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante

(Copy this table for each data or parameter.)

Data/Parameter	fNRB,y
Unit	%
Description	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable
Source of data	FAO Global Forest Resources Assessment 2010 2006 IPCC Guidelines for National Greenhouse Gas Inventories
Value(s) applied	82.1%
Choice of data or measurement methods and procedures	The assessment of the non-renewability of biomass within the project boundary is performed as per the procedure contained in AMS-I.E. The calculation is shown in Appendix IV.
Purpose of data/parameter	Calculation of baseline/project emissions
Additional comments	Ex ante physical survey by the project participant is not required as the data was publicly available by an independent parties

Data/Parameter	Ry,i
Unit	liters/person/day
Description	The average volume of drinking water per person per day
Source of data	“Minimum water quantity needed for domestic uses ”by WHO Regional Office for South-East Asia
Value(s) applied	3.5
Choice of data or measurement methods and procedures	Official data from standard water requirements
Purpose of data/parameter	Calculation of baseline/project emissions
Additional comments	Ex ante physical survey by the project participant is not required as the data was publicly available by an independent parties.

Data/Parameter	$EF_{projected\_fossilfuel}$
Unit	tCO_2/TJ
Description	Emission factor for the substitution of non-renewable woody biomass or the emission factor of the fossil fuel substituted by similar consumers.
Source of data	Default value from AMS-I.E as referenced by AMS-III.AV Version 4
Value(s) applied	81.6
Choice of data or measurement methods and procedures	Default value from AMS-I.E. This value represents the emission factor of the substitution fuels likely to be used by similar users, on a weighted average basis. It is assumed that the mix of present and future fuels used would consist of a solid fossil fuel (lowest in the ladder of fuel choices), a liquid fossil fuel (represents a progression over solid fuel in the ladder of fuel use choices) and a gaseous fuel (represents a progression over liquid fuel in the ladder of fuel use choices). Thus a 50 per cent weight is assigned to coal as the alternative solid fossil fuel (96 t CO_2/TJ) and a 25 per cent weight is assigned to both liquid and gaseous fuels (71.5 t CO_2/TJ for kerosene and 63.0 t CO_2/TJ for liquefied petroleum gas (LPG).
Purpose of data/parameter	Calculation of baseline emissions

Additional comments	-

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

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

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

Data/Parameter	WHE

Unit	kJ/L
Description	Latent Heat of Water Evaporation
Source of data	Default Value from AMS-III.AV Version 4
Value(s) applied	2,260
Choice of data or measurement methods and procedures	-
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

Data/Parameter	L
Unit	-
Description	Leakage relating to non-renewable woody biomass
Source of data	Default Value from AMS-I.E Version 6
Value(s) applied	0.95
Choice of data or measurement methods and procedures	-
Purpose of data/parameter	Calculation of leakage emissions
Additional comments	-

Data/Parameter	Case 1 or Case 2
Unit	-
Description	Classifies the proposed project as either Case 1 or Case 2
Source of data	WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation (http://www.wssinfo.org/fileadmin/user_upload/resources/Indonesia.xls, tab "Estimates")
Value(s) applied	**Case 2**
Choice of data or measurement methods and procedures	According to data which is available from WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation (http://www.wssinfo.org/fileadmin/user_upload/resources/Indonesia.xls, tab "Estimates"), the proportion of urban, rural and total population using an improved drinking-water source of the most recent year (2015) is 94%, 79% and 87% respectively. These proportion are higher than 60% therefore the project case is Case 2.
Purpose of data/parameter	Calculation of baseline /project emissions
Additional comments	The proposed project is classified as Case 1 or Case 2 depending on the fraction of the population using an improved drinking-water source prior to the implementation of the proposed project. This proposed project is classified as Case 2.

Data/Parameter	X_{boil}
Unit	%

Description	Fraction of the population serviced by the project activity for which the common practice of water purification is or would have been water boiling
Source of data	Nazava_MP1(2018)_ProjectSurveyData_20181212, tab Analysis, Cell C7
Value(s) applied	88.26%
Choice of data or measurement methods and procedures	Result of the monitoring survey
Purpose of data/parameter	Calculation of baseline /project emissions
Additional comments	According to the applied methodology, the project fall to Case 2. Therefore, the following adjustment is required: «*For Case 2, total project population needs to be adjusted for the fraction of the population serviced by the project equipment at households/buildings for which it can be demonstrated through documentation or survey that the practice of water purification would have been water boiling*» - AMS III.AV, version 4, paragraph 11. During the validation stage, due to no available survey with the project filter users (or «the population serviced by the project equipment»), PP applied the Xboil factor of 70.1% according to the Indonesian Demographic and health survey 2012 report for ex-ante ER calculation. This survey was a general survey and was not targeted the specific project user group of having CWF. Therefore, during the first verification, the PP conducted the survey according to methodology requirement. Thus, PP proposes to apply this latest survey result which well reflects the baseline situation of the project targeted households.

Data/Parameter	$\eta_{wb,y}$
Unit	fraction
Description	Efficiency of water boiling system being replaced
Source of data	Default efficiencies from AMS-III.AV Version 4 for each baseline technology Percentage of fuel types
Value(s) applied	0.4
Choice of data or measurement methods and procedures	Weighted average efficiency is calculated from default values from AMS III.AV and percentage of fuel types according to the table below:
Purpose of data/parameter	Determination of baseline emissions

Fuel type	Percentage [15]	Efficiency
LPG	51.8%	0.5
Kerosene	7.4%	0.5
Wood	37.6%	0.2
Charcoal	0.4%	0.2
Other	2.8%	1
Weigh averaged efficiency n_{wb}		**0.4**

[15] Indonesian Demographic and health survey report published by Indonesian Ministry of Health on Aug 2013

Additional comments	The efficiency of 0.5 was applied for LPG and Kerosene stoves according to the methodology AMS III.AV, version 4, section 5.2: *"(c) 0.5 default value may be used if the replaced system or the system that would have been used is a fossil fuel combusting system"* Similarly, the efficiency of 0.2 was applied for wood and charcoal stoves as below: *"(b) 0.10 default value may be optionally used if the replaced system or the system that would have been used is a three stone fire or a conventional system for woody biomass lacking improved combustion air supply mechanism and flue gas ventilation system i.e. that is without a grate as well as a chimney; for the rest of the systems using woody biomass 0.2 default value may be optionally used"* Regarding the "Other" stoves, the efficiency 1 (or 100%) was applied as conservative approach for ER estimation.

D.2. Data and parameters monitored

(Copy this table for each data or parameter.)

Data/Parameter	QPW_y
Unit	Litres/yr/unit
Description	Quantity of purified water in year y (litres)
Measured/calculated/ default	Calculation
Source of data	Nazava_MP1(2018)_ER_20190124, Tab ERInput Cell D8
Value(s) of monitored parameter	4,320
Monitoring equipment	Calculation
Measuring/reading/recording frequency	Every two years

<table>
<tr><td>Calculation method (if applicable)</td><td>The value is estimated using below equation.

$$QPW_y = \sum_{0}^{i} T_{y,i} * N_{y,i} * R_{y,i} * 365 * Water\ Quality * Operational\ Units * X_{boil}$$
<table>
<tr><th>Parameter</th><th>Description</th><th>Value</th><th>Source/comment</th></tr>
<tr><td>QPWy</td><td>Quantity of purified water in year y (litres)</td><td>4,320 (L/yr/unit)</td><td>Calculated</td></tr>
<tr><td>Ty,i</td><td>Distributed water purification unit</td><td>1 (1 unit)</td><td>For one unit</td></tr>
<tr><td>Ny,i</td><td>The average population serviced by water purification system</td><td>4.32</td><td>See below</td></tr>
<tr><td>Ry,i</td><td>The average volume of drinking water per person per day</td><td>3.5 (L/day)</td><td>See section D1</td></tr>
<tr><td>Water Quality</td><td>Water quality</td><td>88.71%</td><td>See below</td></tr>
<tr><td>Operational Units</td><td>Usage rate of the sold units based on its age group</td><td>100%</td><td>Assumption 100% for 1 active unit</td></tr>
<tr><td>Xboil</td><td>Fraction of the population serviced by the project activity for which the common practice of water purification is or would have been water boiling</td><td>88.26%</td><td>Section D.1</td></tr>
</table></td></tr>
<tr><td>QA/QC procedures</td><td>The result is estimated in ER spreadsheet and is available on request to the VVB.</td></tr>
<tr><td>Purpose of data/parameter</td><td>GHG Emission reduction</td></tr>
<tr><td>Additional comments</td><td></td></tr>
</table>

Data/Parameter	Ty,i
Unit	Number
Description	Total distributed water purification units
Measured/calculated/ default	The total number of units by technology type and date deployed is tracked in the Sale Database, using Sales Receipts. All units distributed will be recorded. Any unit not recorded in the sale database will not be credited for emission reductions.
Source of data	Nazava_MP1(2018)_SaleData, Tab Summary_Sale
Value(s) of monitored parameter	87,879
Monitoring equipment	Record
Measuring/reading/recording frequency	Continuous and aggregated monthly
Calculation method (if applicable)	
QA/QC procedures	Sales database is cross checked with paper records to ensure transparent and robust data. They are available for VVB to be verified.
Purpose of data/parameter	Calculation of QPW_y and ER calculation- Quantity of purified water in year y (litres) and baseline emissions
Additional comments	

Data/Parameter	$N_{y,i}$

Unit	Persons/Units
Description	The average population serviced by water purification system
Measured/calculated/ default	Calculation
Source of data	Nazava_MP1(2018)_ProjectSurveyData_20181212, Tab UsageRate&#PP, Cell O8
Value(s) of monitored parameter	4.32
Monitoring equipment	NA
Measuring/reading/recording frequency	Every two years
Calculation method (if applicable)	Monitoring survey is conducted on sample of units
QA/QC procedures	According to the EB 86 Annex 3 "Standard for Sampling and Surveys for CDM PAs and PoAs" Version 05.0, paragraph 10 "*Where there is no specific guidance in the applicable methodology, project proponents shall use 90/10 confidence/precision as the criteria for reliability of sampling efforts for small-scale project activities and 95/10 for large-scale project activities*." Because the proposed project activity is the small scale project and there is no specific requirement in the applied methodology AMS III.AV, version 4, so the 90 per cent confidence interval and a 10 per cent margin of error requirement shall be achieved for the sampling parameter. In cases where survey results indicate that 90/10 precision is not achieved, the lower bound of 90 per cent confidence interval of the parameter value may be chosen as an alternative to repeating the survey efforts to achieve the 90/10 precision.
Purpose of data/parameter	Calculation of QPW_y - Quantity of purified water in year y (litres) and baseline emissions
Additional comments	

Data/Parameter	$WQ_{passedWHO}$
Unit	%
Description	Water Quality Passed Rate (WHO standard)
Measured/calculated/ default	Calculation
Source of data	Nazava_MP1(2018)WaterQualityTest_20181212, Tab Results Cell R70
Value(s) of monitored parameter	88.71%
Monitoring equipment	Mobil testing kit: Compact dry Compact Dry E. coli/Coliform Count (EC) is a ready-to-use test method for the enumeration of Escherichia coli and coliform bacteria in food and water. The results are as good as other testing methods: https://www.ncbi.nlm.nih.gov/pubmed/16512235. The manual of the product can be found here. The test can be done in the field with a mobile incubator because the tool is very light.
Measuring/reading/recording frequency	Every two years
Calculation method (if applicable)	
QA/QC procedures	The result of the water quality test survey is analysed and the raw data is available on request to the DoE.

Purpose of data/parameter	Calculation of QPW_y (Quantity of purified water in year y (litres)) and baseline emissions
Additional comments	

Data/Parameter	Usage rate
Unit	%
Description	Percentage of sold unit in operation
Measured/calculated/ default	Calculation
Source of data	Nazava_MP1(2018)_ProjectSurveyData_20181212, Tab UsageRate&#PP
Value(s) of monitored parameter	

Age group				Usage rate
0	to	1	years	96.39%
1	to	2	years	97.56%
2	to	3	years	78.15%
3	to	4	years	71.67%
4	to	5	years	47.62%
5	to	6	years	4.90%
6	to	7	years	0.00%
7	to	8	years	0.00%
8	to	9	years	0.00%

Monitoring equipment	Questionnaires
Measuring/reading/recording frequency	Every two years
Calculation method (if applicable)	Annual average usage rate is employed.
QA/QC procedures	The result of the usage rate is analyzed and the raw data is available on request to the DoE.
Purpose of data/parameter	Calculation of QPW_y (Quantity of purified water in year y (litres)) and baseline emissions
Additional comments	

Data/Parameter	SDW
Unit	%
Description	Existence of public distribution network of safe drinking water
Measured/calculated/ default	Calculation
Source of data	”Nazava_MP1(2018)_SDW_MonitoringReport”
Value(s) of monitored parameter	0
Monitoring equipment	Questionnaires
Measuring/reading/recording frequency	Annually
Calculation method (if applicable)	Based on literature review or field survey, SDW is monitored as elaborated in “Nazava_MP1(2018)_SDW_MonitoringReport”.
QA/QC procedures	The result of the usage rate is analysed, and the raw data is available on request to the DoE.
Purpose of data/parameter	Eligibility criteria
Additional comments	

D.3. Implementation of sampling plan

>>

Per registered PDD (page 29), three parameters are required to be monitored by using sampling method. The three parameters are: (1) the average population serviced by water purification system (Ny,i) and (2) Percentage of Operational Units or Usage rate, and (3) Water quality survey test.

Sample plan for Monitoring survey (Usage and Project survey) and water quality test survey are prepared in accordance to the approved sample plan under the registered PDD. The detailed of the sample plan is described in "PTH_MP1_Nazava_SamplePlan20180813". The table below just summary the sample size estimated in the sample plan and the actual survey.

No	Parameters to be monitored	Name of the survey	Planned Sample size	Actual survey household	Comment/Justification
1	Average population services by water purification system (Ny,i)	Project survey	270	213	Although the actual surveyed households were less than the plan one, it is still meeting 90/10 rule for determined average persons per household.
2	Percentage of operational Units	Usage survey	320	503 (431 from field interview field survey and 72 from telephone survey)	The samples were increased to include difference age of the filter which may reflect the actual usage rate.
3	Water quality test survey	Water quality survey	50	62	The test water sample is higher than what has plan to increase its reliability.

SECTION E. Calculation of emission reductions or net anthropogenic removals

E.1. Calculation of baseline emissions or baseline net removals

>>

Per registered PDD, the baseline emission can be estimated by using the two main equations

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

Where:

Parameter	Description	Value	Source
BEy	Baseline Emission in year y	To be calculated	
QPWy	Quantity of purified water in year y (litres)	4,320 (L)/y/unit	Section D.2
SEC	Specific energy consumption required to boil one litre of water	893.70 (kJ/L)	Nazava_MP1(2018)_ER_20190124
fNRB,y	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable	82.1%	Section D.1
$EF_{projected\_fossilfuel}$	Emission factor for the substitution of non-renewable woody biomass or the emission factor of the fossil fuel substituted by similar consumers	81.6 (tCO_2/TJ)	Section D.1

$$QPW_y = \sum_{0}^{i} T_{y,i} * N_{y,i} * R_{y,i} * 365 * Water\ Quality * Operational\ Units * X_{boil}$$ Equation 2

Where

Parameter	Description	Value	Source
QPWy	Quantity of purified water in year y (litres)	4,320 (L/y/unit)	Section D.2
Ty,i	Total distributed water purification units	87,879	Section D.2
Ny,i	The average population serviced by water purification system	4.32	Section D.2
Water Quality		88.71%	Section D.2
Ry,i	The average volume of drinking water per person per day	3.5	Section D.1
Operational Units	Usage rate of the sold units based on its age group	Age group / Usage rate 0 to 1 years: 96.39% 1 to 2 years: 97.56% 2 to 3 years: 78.15% 3 to 4 years: 71.67% 4 to 5 years: 47.62% 5 to 6 years: 4.90% 6 to 7 years: 0.00% 7 to 8 years: 0.00% 8 to 9 years: 0.00%	Section D.2
Xboil	Fraction of the population serviced by the project activity for which the common practice of water purification is or would have been water boiling	88.26%	Section D.1

By substituting all the known parameters from D1 and D2 section into Equation 1 and Equation 2, the baseline emission is estimated to be **30,399 tCO2e**. The detail calculation can be found in "Nazava_MP1(2018)_ER_20190124, Tab ER&SD, Cell C9"

E.2. Calculation of project emissions or actual net removals

>>

Based on the proposed methodology and the registered PDD. There is no project emission.

E.3. Calculation of leakage emissions

>>

To account for leakages associated to non-renewable woody biomass a fixed adjustment factor of 0.95 was applied according to the AMS I.E version 6.0.

Leakage emissions = 30,399 *(1 - 0.95) = **1,520 tCO2e**[16]

[16] See Nazava_MP1(2018)_ER_20190124, Tab ER&SD, Cell E9.

E.4. Calculation of emission reductions or net anthropogenic removals

The emission reduction is calculated as below:

$ER_y = BE_y – PE_y - LE_y$

The result of ER calculation is presented in the below table

Vintage (including both start and end date)	Baseline GHG emissions or baseline net GHG removals BEy (t CO_2e))	Project GHG emissions or actual net GHG removals PEy (t CO_2e)	Leakage GHG emissions LE (t CO_2e)	GHG emission reductions or net anthropogenic GHG removals ERy (t CO_2e)
From 19/12/2015 to 31/12/2015	228	0	11	217
From 01/01/2016- to 31/12/2016	7,888	0	394	7,493
From 01/01/2017 to 31/12/2017	10,713	0	536	10,177
From 01/01/2018 to 18/12/2018	11,571	0	579	10,992
Total	30,399	0	1,520	28,879

E.5. Comparison of emission reductions or net anthropogenic removals achieved with estimates in the registered PDD

Item	Amount estimated ex ante[17] (t CO_2e)	Amount achieved during this monitoring period (t CO_2e)
Emission reductions or GHG removals by sinks (t CO_2e)	32,108	28,879

E.6. Remarks on increase in achieved emission reductions

>> NA (the achieved emission reduction is lower than that of ex ante estimation)

[17] Based on PDD, page 24, the ER estimated from 19 Dec 2015 to 18 Dec 2018 can be calculated [(5,432/365)*13+7,440+10,452+(14,541/365)*352]

SECTION F. Results of monitoring sustainable development indicator

F.1. Safeguard Principles

The next table summarizes the outcome of the 'Do no Harm' Assessment in the GSPR (GS Passport Report), and list the safeguard principles for which mitigation has been identified.

Safeguarding principles	Application of mitigation measure
1.The project respects internationally proclaimed human rights including dignity, cultural property and uniqueness of indigenous people. The project is not complicit in Human Rights abuses.	Not required
2. The project does not involve and is not complicit in involuntary resettlement.	Not required
3. The project does not involve and is not complicit in the alteration, damage or removal of any critical cultural heritage	Not required
4. The project respects the employees' freedom of association and their right to collective bargaining and is not complicit in restrictions of these freedoms and rights	Not required
5. The project does not involve and is not complicit in any form of forced or compulsory labor	Not required
6. The project does not employ and is not complicit in any form of child labor	Not required
7. The project does not involve and is not complicit in any form of discrimination based on gender, race, religion, sexual orientation or any other basis.	Not required
8. The project provides workers with a safe and healthy work environment and is not complicit in exposing workers to unsafe or unhealthy work environments.	Not required
9. The project takes a precautionary approach in regard to environmental challenges and is not complicit in practices contrary to the precautionary principle.	Not required
10. The project does not involve and is not complicit in significant conversion or degradation of critical natural habitats, including those that are (a) legally protected, (b) officially proposed for protection, (c) identified by authoritative sources for their high conservation value, or (d) recognized as protected by traditional local communities.	Not required
11. The project does not involve and is not complicit in corruption.	Not required

The safeguard principles identified by the Gold Standard are relevant for all projects, however for this project no mitigation measures are to be monitored according to the GSPR.

F.2. Sustainability monitoring plan

This section assesses the performance of the VGS project on the sustainability indicators by indicator (ID) identified according to the monitoring plan described in the GSPR using survey methods where applicable

ID 1: Water quality and quantity

The next table shows the scoring on the SD indicator on water quality and quantity

No	1
Indicator	**Water quality and quantity**
Mitigation measure	No mitigation is required because by using the project technology, it improves drinking water quality and provides storage which will increase accessibility to sage drinking water quantity.
Chosen parameter	Number of people served with a satisfactory level of safe

		drinking water (water quality passed WHO standard)
Situation of parameter at 18/12/2018 (MP1)		171,308 people[18]
Estimation of baseline situation of parameter		Only 2.3% of households in Indonesia use a water filter (which includes Ceramic, sand or other filter) to treat drinking water Because this survey did not distinguish between types of water filters, it can be assumed that the percentage of households which have adopted a ceramic water purifier (the project technology) in Indonesia is less than 2.3%.
Future target for parameter		240,409 people[19] still use the water filter at end of the first crediting period.
Way of monitoring	How	Using the result of the monitoring survey the number of people served with safe drinking water (WHO standard) is estimated: = Number of Sold CWFs * Usage Rate * Water Quality passed rate * Number of people per household
	When	Biennial monitoring
	By who	Carbon project consultant

ID 2: Livelihood for the poor

The next table shows the scoring on the SD indicator on water quality and quantity

No		**2**
Indicator		**Livelihood for the poor (positive score)**
Mitigation measure		None needed – the project has a positive impact for this Indicator as describe in GSPR
Chosen parameter		- Amount of fuel save (Increased income through fuel savings) - Percentage of user claimed time saving via eliminating/reducing the need to boil water for drinking.
Situation of parameter at 18/12/2018 (MP1)		- 12,422 tonnes of wood equivalent[20] - 6,383 tonnes of LPG[21] - 97.21%[22]
Estimation of baseline situation of parameter		0 (zero)
Future target for parameter		- Amount of wood equivalent save: 48,911 tonnes[23] - Amount of LPG/Kerosene save: 25,131 tonnes[24] - Percentage of user claiming saving time: 98% (Assumption)
Way of monitoring	How	Based on the result from monitoring survey, the amount of fuel saving is estimated and the percentage of people claiming time saving is reported.
	When	Biennial monitoring
	By who	Project participant with its carbon consultant conduct monitoring survey and analyse the data

[18] Nazava_MP1(2018)_ER_20190124, Tab ER&SD, Cell M8 (Note: this is the average number of users expected to use water filters by end of MP1).

[19] Nazava_MP1(2018)_ER_20190124, Tab ER&SD, Cell M15 (Note: this is the average number of users expected to use water filters by end of crediting period.

[20] Nazava_MP1(2018)_ER_20190124, Tab ER&SD, Cell T9

[21] Nazava_MP1(2018)_ER_20190124, Tab ER&SD, Cell T19

[22] Nazava_MP1(2018)_ProjectSurvey_20181212, Tab Analysis, Cell D86

[23] Nazava_MP1(2018)_ER_20190124, Tab ER&SD, Cell T11

[24] Nazava_MP1(2018)_ER_20190124, Tab ER&SD, Cell T21

No		3
Indicator		**Access to affordable and clean energy services (positive score)**
Mitigation measure		Efforts will be made to possibly provide subsidized products and develop distribution channels in the future with the help of carbon revenues
Chosen parameter		The total number of water filters disseminated will give an indication of how many people are able to access affordable clean energy products.
Situation of parameter at 18/12/2018 (MP1)		87,879 CWFs[25] were sold
Estimation of baseline situation of parameter		Only 2.3% of households in Indonesia use a water filter (which includes Ceramic, sand or other filter) to treat drinking water6. Because this survey did not distinguish between types of water filters, it can be assumed that the percentage of households which have adopted a ceramic water purifier (the project technology) in Indonesia is less than 2.3%.
Future target for parameter		165,379 CWFs[26] will be sold by end of crediting period (29/02/2024)
Way of monitoring	How	Sale database is tracked all the sale
	When	Monthly
	By who	Project participant

No		4
Indicator		**Quantitative employment and income generation**
Mitigation measure		None needed – the project has a positive impact for this Indicator as describe in GSPR
Chosen parameter		Number of local jobs created in production, distribution, and retail.
Situation of parameter at 18/12/2018 (MP1)		- Direct employment (employed by the project): 23 staffs (3 females) - Indirect employment(retailer, sell coordinators) : 80 people (44 females)
Estimation of baseline situation of parameter		0 prior to the project activity
Future target for parameter		At least the current employment is maintained
Way of monitoring	How	Track direct employment associated with the project. Record from factory or direct interview with retailers
	When	Biennial monitoring
	By who	Project participant, Implementation partner(s), retailers

[25] Nazava_MP1(2018)_2018, Tab Summary_Sale, Cell C90

[26] Nazava_MP1(2018)_ER_20190124, Tab Sale_Actual&forcast, Cell D152

SECTION G. Grievance Mechanism

Description	Method Chosen (include all known details e.g. location of book, phone, number, identity of mediator)	Monitoring result up to end of MP1
Continuous Input / Grievance Expression Process Book	A comment book is available at Nazava offices in Bandung and Banda Aceh: Komplek Cimindi Raya Blok X no 2 Jalan Budi Cimahi Utara, Kota Cimahi Jawa Barat Jalan Dr Mr Teuku Hassan Muhammad 134 Desa Batoh Kecematan Lueng Bata Banda Aceh	No comments
Telephone access	Nazava +6281360862522	No comments
Internet/email access	https://www.facebook.com/nazava http://nazava.com/english/contactNazavaWaterFilters.php info@nazava.com Tel of project participant: (856-41) 252717 GS contact +41 22 788 7080	No comments
Nominated Independent Mediator (optional)	NA	NA

SECTION H. Forward Actions Requests

One FAR was reported in the validation report and it is addressed in the following:

Forward Action Requests	Summary of PP's response
FAR 01 The validation team did not see direct evidence of the end users receiving warranty cards that specifically detail that the rights to carbon savings will be transferred to the project implementer. The PP plans to design a sticker for the filter buckets that will detail product information as well as carbon rights waiver. The verifying DOE is to check these filter buckets with new stickers to ensure that the end users are being provided with enough information to be aware that they are ceding rights to VERs.	As plan, PP has designed a sticker for the filter buckets that explain the operation and maintenance of the tulip candle as well as the note on carbon rights waiver in local language.  It states the filters can be sold cheap because their price is subsidized with carbon credits. By buying the product the user transfers the rights on the carbon credits to PT Holland for Water.

Annex 1: Contact details of the Project Participants

Project participant and/or responsible person/ entity	☒ Project participant ☐ Responsible person/ entity for application of the selected methodology (ies) and, where applicable, the selected standardized baselines to the project activity
Organization name	PT Holland for Water
Street/P.O. Box	Jalan Kolonel Masturi 345. Kav 1,KM 1.4 RW 22, RT 01 Kel. Cipageran Kec. Cimahi Utara, 40511 Cimahi Indonesia
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Contact person	Guido van Hofwegen
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