

GS 3698

**Gold Standard for the Global Goals
Transition Annex**

*(To be used by all GS CDM/VER stand alone projects and PoAs, Micro
Scale stand alone projects and Micro PoAs)*



Version 1 – September 2017

KEY PROJECT INFORMATION

Title of Project/PoA/Activity:	Native Energy Clean Water Programme South East Asia: GS 3698 Native Energy Clean Water Programme South East Asia:NE_VPA 01_IND; GS 3964
GS ID of the project/PoA/activity:	POA GS ID: GS 3698 VPA GS ID: GS 3964
GS Version:	Version 2.2
Brief description of Project:	"Native Energy Clean Water Programme South East Asia" is a Gold Standard micro scale programme of activities (PoA) which aims to reduce wood fuel consumption as is traditionally used to boil water for domestic/non-residential water treatment by introducing zero energy water filter technology. The Coordinating/ Managing Entity (CME) to the project activity is Native Energy (described in detail in section A.2 of this micro scale PDD) is an American social enterprise that manufactures and distributes the zero energy BioSand water filter in an effort to provide households in the developing world with convenient and affordable access to safe drinking water. This micro-scale PoA shall apply the Gold Standard methodology "Technologies and Practices to Displace Decentralized Thermal Energy Consumption, Version 2.2", and therefore shall incorporate any project technologies or activities that displace thermal energy consumption in existing baseline practices. The justification for the use of the methodology is drawn from the following excerpt: "The methodology allows project technologies and practices that reduce the amount of CO₂-emitting fuel consumed by changing kitchen practice from water boiling as a purification technique to the introduction of new 'zero emission technology' that provides safe water, e.g. gravity household water filters, borehole pumps (not fossil fuel-driven) and their repair/maintenance/operation, ultraviolet radiation treatment, chlorine tablets, etc¹.
Project type: Energy/Land Use	Energy
GS Stream (CDM/VER):	VER

¹ Gold Standard Methodology TPDDTEC: Annex 3 Application of the methodology to safe water supply project scenarios

Scale (large/scale/micro):	Micro Scale
GS Registration Date:	12/08/2019
GS Crediting period start date:	1/05/2019
CDM Registration Date:	N/A
CDM Crediting period start date:	N/A
Project Developer:	Native Energy
Project Representative:	Native Energy
Project Participants and any communities involved:	Native Energy
Host Country/Location:	The Republic of India
Methodologies applied:	Technologies and Practices to Displace Decentralized Thermal Energy Consumption 11th February 2011, Version 2.2.
SDG Impacts:	1 SDG 3 Good health and well-being 2 SDG 6 Clean water and sanitation 3 SDG 8 Decent work and Economic growth 4 SDG 13 Climate Action
VPAs included	GS 3964 (VPA 1)
Estimated amount of SDG Impact (GSVERs and others)	SDG 3: Usage 80%, Quality of treated water 80%, Np,y 1,825, Reduction of water borne diseases 70%, Perceived change in air quality 60% SDG 6: Quantity of treated water per person per day 5 litres, Quantity of raw water boiled 0, Quantity of water filtered then boiled 0, Number of people trained 10 SDG 8: Number of people employed 5, average income generation per person 10,000 INR, SDG 13: 97,620.40 tCO2

NOTE: This Annex shall be used for all PoAs if the sustainable development assessment is conducted at PoA level. In case sustainable development assessment is conducted at activity level, then this Annex shall be filled for each of the activities.

SECTION A Sustainable Development Goals (SDG) outcomes

A.1 Relevant target for each of the three SDGs

Indicator	Mitigation measure	Relevance to achieving SDG Target	Chosen Monitoring Indicator and explanation
3.9.1 Illnesses and Mortality rates attributed to household and ambient air pollution	No mitigation measure	Conforms to: SDG 3: Ensure healthy lives and promote well-being for all at all ages Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination Indoor air pollution caused by combustion of wood fuel will be reduced since there will be no more boiling of water.	Measurement of user perceptions between the baseline and project scenario: smoke levels, incidence of coughing, incidence of respiratory illness, and incidence of itchy eyes. <u>Perceived change in air quality</u> The VPA DD shall describe how the introduction of the project technology will achieve an improvement on the chosen indicator.
3.9.2 Illnesses and Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)	No mitigation measure	SDG 3: Ensure healthy lives and promote well-being for all at all ages Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination. Using the project	<u>Levels of coliforms in drinking water:</u> The VPA DD shall describe how the introduction of the project technology will achieve an improvement on the chosen indicator.

		technology will provide the households with safe water for consumption hence reduce exposure to water borne diseases.	
6.1.1 Proportion of population using safely managed drinking water services	No mitigation measure	SDG 6: Ensure and sustainable management of water and sanitation for all Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all Deaths and diseases caused by water borne diseases will be reduced since clean water is readily available. General health of the family will be improved.	<u>Volume of safe water consumed in the project scenario</u> The project shall monitor the volume of safe water treated by the project technology and consumed by households in the project scenario.
6.b.1 Participation of local communities in water and sanitation management	No Mitigation measure	Target 6.b(1): Support and strengthen the participation of local communities in improving water and sanitation management. The VPA operator will organize trainings and workshops for recruited Community Health Workers and Surveyors who shall take part in installation and maintenance of the filters and monitoring surveys. This will seek to sensitize locals on how to	<u>Number of people trained on water, hygiene and sanitation improvement</u> The PP shall monitor the number of people attending trainings, seminars or workshops organised by the project on water, hygiene and sanitation improvement

		maintain the filters to enhance the quality of water, hygiene and sanitation.	
8.5.1 Average hourly earnings of female and male employees, by occupation, age and persons with disabilities	No mitigation measure	SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all Target 8.5: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value. The project activity will provide job opportunities for all locals irrespective of gender or any other status. Equal pay for work of equal value will be made to both men and women. This water filtration project will provide job opportunities for the locals both during project implementation and monitoring activities.	<u>Number of persons employed by the project</u> <u>Employment Records</u> The VPA DD shall describe how the introduction of the project technology will achieve an improvement on the chosen indicator. Income generation: <u>Records of income generated by employees enrolled in the project activity.</u> The VPA DD shall describe how the introduction of the project technology will achieve an improvement on the chosen indicator.
13.3.2 Systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions	No mitigation measure	SDG 13: Take urgent action to combat climate change and its impacts Target 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.	<u>Change in Traditional fuel consumption (% of total energy requirements)</u> <u>Surveys</u> The VPA DD shall monitor emission reductions achieved by the project.

		The project technology attracts energy cuts across all the above SDGs and with clean energy the following are reduced; poverty, hunger, health is improved, and diseases are combated, and environmental sustainability is maintained.	
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A.2 Explanation of methodological choices/approaches for estimating the SDG outcome

Title: 'Technologies and Practices to Displace Decentralized Thermal Energy Consumption 11th February 2011, Version 2.2'².

1. Approved baseline and monitoring methodology

This project qualifies under the above stated methodology, which provides the following:

1. *This methodology is applicable to programs or activities introducing technologies and/or practices that reduce or displace greenhouse gas (GHG) emissions from the thermal energy consumption of households and non-domestic premises.*

The project activity will introduce point of use water purification technology that will displace the use of fuel wood traditionally used to treat drinking water.

2. *The project boundary can be clearly identified, and the technologies counted in the project are not included in another voluntary market or CDM project activity (i.e. no double counting takes place). Project proponents must have a survey mechanism in place together with appropriate mitigation measures so as to prevent double-counting in case of another similar activity with some of the target area in common.*

The project boundary is defined as the point of use of the BioSand Water Filters. This includes installations at households.. The target area is well demarcated in each VPA-DD and each filter has a unique serial number. For easy access and to prevent double counting, the VPA Implementer who carried out installation will maintain installation and monitoring records. Only Concrete Biosand Filters and Hydrad Biosand Filters carrying unique serial numbers shall be included in the project activity.

3. *Only end users that boil water or are currently using unsafe water are eligible for crediting.*

Baseline surveys shall be conducted across a representative sample of the population to ensure that only end users who boil water or consume it without treatment (raw) are included in the project activity.

² http://www.goldstandard.org/wp-content/uploads/2011/10/GS_110411_TPDDTEC_Methodology.pdf

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4. *The project proponent must clearly communicate to all end users and or individual VPA operators that he is claiming ownership rights of and selling the emission reductions resulting from the project activity.*

At the point of installation each consumer will be informed of the transfer of ownership of the emissions reductions to the project owner. A sticker will be physically attached to each project filter included in the project activity that clearly states that the VERs realized from the use of the filter are property of Native Energy. A separate contractual agreement between Native Energy and Individual VPA operators shall be entered transferring all VERs to the CME for VER sharing agreements.

5. *The technologies each have continuous useful energy outputs of less than 150kW per unit (defined as total energy delivered usefully from start to end of operation of a unit divided by time of operation). For technologies or practices that do not deliver thermal energy in the project scenario but only displace thermal energy supplied in the baseline scenario, the 150kW threshold applies to the displaced baseline technology.*

The project activity seeks to displace the use of woody biomass and other GHG emitting fuels used in the baseline scenario to provide thermal energy for boiling water. As each filter is distributed on an end-user basis equation to determine the amount of energy displaced in the baseline shall be back calculated depending on the amount of thermal energy required by each end-user to boil water in the baseline scenario using water consumption rates in the project scenario and multiplied by the number of filters which the project activity seeks to displace.

$$150 \text{ kW} > \frac{\text{HG b,y} \times \text{CF TJ/kWh}}{\text{HR(D,H)}}$$

Where:

$$\text{CF TJ/KWh}^3 = 277,777.78$$

HG b, y = Thermal energy output per litre of water boiled * amount of water boiled per household/end user per day and is calculated as follows:

$$\text{HG b, y} = (\text{WFC} * \text{N}) * \text{NCV} * \text{E cookstove}$$

Where⁴:

WFC = Wood fuel consumption in tonnes for every litre of water boiled (0.000395373tonnes)

TWFC = Total Wood fuel consumption in tonnes for water boiled per household (25 litres = 5 persons * 5 litres per persons per day)

NCV = Net calorific value of wood fuel (112 TJ/tonne)

³ Conversion factor from TJ to KWh: <http://www.convertunits.com/from/TJ/to/kilowatt+hours>

⁴ The included in the calculations herein are for demonstration purposes only. The proposed PoA does not have standardized baselines and these values were obtained from baseline testing from NE-VPA-01-IND the first VPA for inclusion in the proposed PoA

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$E_{\text{cook stove}}$ = efficiency cook stoves used in the baseline scenario (0.10 AMS-II.G default for traditional cook stoves)

N_{hh} = Number of litres of safe water provided in the baseline scenario (5 Litres*5 –Average Persons per Household-Baseline survey)

HR = Number of hours in a year in which water is treated in the baseline scenario (365 hours)⁵

To calculate thermal output per baseline technology the following formula shall be used:

The equation above is a modification on the Gold Standard methodology "Thermal energy from plant oil for the user of cooking stoves" which provides the equation to calculate thermal energy from cook stoves as follows:

$$HG_{y,i} = FC_{VO,i,y} * NCV_{\text{veg},i} * 10^{-3} * \eta_{\text{thVO},i} \quad (\text{Equation 4 of the said methodology})$$

Where:

$HG_{y,i}$ = Net quantity of heat supplied by the project activity during the year y on basis of vegetable oil "i"

$FC_{\text{vo},i,y}$ = Total quantity of vegetable oil type i used per year by oil stoves in the project

$NCV_{\text{veg},i}$ = Net calorific value of vegetable oil type "i" (TJ/Gg)

$\eta_{\text{thVO},i}$ = Efficiency of the plant using vegetable oil 'i'

Step 1:

Given that the fuel used in the project scenario is Ligneous Fuel rather than Vegetable oil, the NCV used shall be that of wood fuel which is itself provided for in the Gold Standard methodology as 112 TJ/tonne. Because the NCV is provided for in TJ/tonne there shall be no need to multiply by 0.001 as is provided for in the vegetable oil methodology owing to the fact that the NCV in that methodology is provided for in TJ/Gg.

Step 2:

To calculate the total amount of wood fuel used, the equation shall be modified from parameter $FC_{\text{vo},i,y}$ to that of a function of parameters WFC and N which are defined as the amount of wood required to boil one liter of potable water (WFC) which is defined from the Water Boiling Tests and the number of liters of safe water provided in the baseline scenario also derived from baseline studies.

Step 3:

To determine the efficiency of the stoves used in the baseline scenario, the PP has used the default value derived from the SSC CDM baseline and monitoring methodology AMS-II.G version 5.

After this modification the equation to calculate the net thermal energy provided by each baseline unit is calculates as follows:

5 Conservative Estimate

$$HG_{b,y} = WFC * N * NCV * E_{cookstove}$$

Where:

WFC = Wood fuel consumption in tonnes for every liter of water boiled (0.000395373)

Tons)

NCV = Net calorific value of wood fuel (112 TJ/ton)

$E_{cookstove}$ = efficiency cook stoves used in the baseline scenario (0.10 AMS-II.G default for traditional cook stoves)

N = Number of liters of safe water provided in the baseline scenario which is provided as 5 liters (conservative estimate to be confirmed during annual monitoring) Step 4:

Upon calculating the net thermal output of each baseline unit in TJ a new equation is introduced to calculate the output in kW. The conversion of TJ to kWh is available from online conversion calculators but thereafter there has to follow a conversion of the kWh to kW which is calculated by converting the kWh output by the number of hours per year in which the baseline unit is used as follows:

$$150 \text{ kW} > \frac{HG_{b,y} \times CF_{TJ/kWh}}{HR(D.H)}$$

Where:

$$CF_{TJ/kWh} = 277,777.78^7$$

$HG_{b,y}$ = Thermal energy output of the baseline appliance.

HR (D.H) = Number of hours in a year in which water is treated in the baseline scenario (365hours) The kilowatt output per unit is 16.85 kW.

6. *The use of the baseline technology as a backup or auxiliary technology in parallel with the improved technology introduced by the project activity is permitted as long as a mechanism is put into place to encourage the removal of the old technology (e.g. discounted price for the improved technology) and the definitive discontinuity of its use. The project documentation must provide a clear description of the approach chosen and the monitoring plan must allow for a good understanding of the extent to which the baseline technology is still in use after the introduction of the improved technology, whether the existing baseline technology is not surrendered at the time of the introduction of the improved technology, or whether a new baseline technology is acquired and put to use by targeted end users during the project crediting period – see section III. The success of the mechanism put into place must therefore be monitored, and the approach must be adjusted if proven unsuccessful. If an*

6 Total thermal energy has been calculated by slight modifications on Equation 4 of the Gold Standard methodology "Thermal energy from plant oil for the user of cooking stoves" Version 1.0 last seen on 13th January 2013 at http://www.cdmgoldstandard.org/wp-content/uploads/2011/10/Thermal_energy_from_plant_oil.pdf

⁷ <http://www.convert-measurement-units.com/conversion-calculator.php?type=energy>

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old technology remains in use in parallel with the improved technology, corresponding emissions must of course be accounted for as part of the project emissions 5.

The baseline technology identified is the use of wood stoves to boil water. The use of this traditional thermal energy source is not however contained to boiling water as thermal energy output of wood stoves is also used for other functions most important of which is cooking. It will therefore not be possible to encourage households to surrender the woodstoves in exchange for the project technology nor is it assumed that there shall be complete abandonment of the stoves. The assumption in the ex-ante stage however, is that these households will completely abandon the practice of boiling water in the project scenario which shall be monitored and accounted for in the project scenario to calculate project scenario fuel consumption and the emissions thereon.

7. *Project activities making use of a new biomass feedstock in the project situation (e.g. shift from non-renewable to green charcoal, plant oil or renewable biomass briquettes) must comply with relevant Gold Standard specific requirements for biomass related project activities, as defined in the latest version of the Gold Standard rules*

The project activity involves zero energy water filtration technology and as such there will be no additional sales of renewable biomass.

Methodological steps for calculating baseline and project outcomes.

SDG 3: Good health and well being

Indicator: Quality of water, Perceived Indoor air pollution

According to WHO, Indoor Air Pollution (IAP) is one of the leading causes of premature deaths in developing countries. Exposure to smoke from cooking fires causes 3.8 million premature deaths each year, mostly in low and middle-income countries who commonly use fuel such as wood, coal, and dung in inefficient cookstoves. This in turn produces harmful pollutants such as methane, carbon monoxide, polycyclic aromatic hydrocarbons and volatile organic compounds. Many studies have demonstrated a direct relationship between exposure to particulate matter and negative health impacts. Exposure to IAP can lead to health problems in both children and adults from respiratory illnesses, eye problems and cancer⁸.

Introduction of zero energy water filters which provides clean water without requiring of boiling contributes to reduction of IAP. Households in developing worlds rely on boiling as one of water purification methods using biomass as a source of wood. This in turn leads to IAP which could lead to various illnesses.

Improved health will be checked through reduction of water borne diseases as well as reduced smoke levels. During the monitoring survey exercise, households will be asked questions to ascertain the extent to which filters have contributed to reducing water borne diseases and results recorded and reported. It is estimated that the projects will achieve 70% reduction of water borne diseases and 60% reduction in smoke levels (perceived change in air quality).

Estimated Net benefit will be calculated as follows:

Project scenario- baseline scenario

⁸ <https://www.who.int/airpollution/household/health-impacts/en/>

Reduction in water borne diseases:

$70\% - 0\% = 70\%$

Perceived change in air quality

$60\% - 0\% = 60\%$

SDG 6: Clean water and sanitation

Indicator: Quality and Quantity of water, trainings on water, sanitation and hygiene

Globally, nearly 2 billion people either consume water from un-improved water sources or improved water sources with faecal contamination. Close to half a million diarrhoea deaths in low- and middle income countries are attributed inadequate drinking water especially among children under 5. As a result, households water treatment and safe water storage is an important health intervention as a way of reducing water borne diseases especially amongst people who depend on water from unsafe water sources or contaminated water from safe water sources

Clean water and sanitation will be monitored through conducting water quality tests where the water samples are expected to adhere to the countries water quality standards or WHO standards in absence of water quality standards.

PP has estimated the project will achieve the following:

Q_{p,y}- 5 litres per person per day

Q_p rawboil_y -0

Q_p clean boil_y-0

Number of people trained on water, sanitation and hygiene- 10

Estimated Net benefit will be calculated as follows:

Difference between baseline scenario and project scenario

Q_{p,y}

$5 - 0 = 5$ litres

Number of people trained

$10 - 0 = 10$ people trained

Q_p raw boil

$0 - 0 = 0\%$ (assumed no one will boil water in the project scenario)

Q_p Cleanboil

$0/0 = 0\%$ (assumed no one with boil water to further purify it in the project scenario)

The PP shall monitor the number of trainings, seminars or workshops organised by the project on water, hygiene and sanitation improvement

SDG 8 Decent work and Economic growth

Indicator: jobs created by the project

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According to the data released by Centre for Monitoring Indian Economy (CMIE) conducted in August 2019, Unemployment rate in urban areas stood at 9.6% while in rural areas the unemployment rate stood at 7.8%. The increase in labour participation is not matched with an increase in employment rate⁹

The project has estimated it will achieve the following;

Number of people employed – 5

Income generation - Average Monthly income is INR 10,000/- per employee Per Month (for VPA-01, in India, the rest of the VPAs will have a different wage target)

The project seeks to create employment opportunities in filter installation, distribution, maintenance and annual monitoring exercise. The jobs created will be monitored during the annual monitoring surveys.

Estimated Net Benefit will be calculated as follows:

Number of people employed:

5-0=5 people

Income generated:

10000-0= 10,000 INR (for VPA 01 in India)

SDG 13 Climate Action

Indicator: Emission Reductions achieved

The hydraid water filter remove E.Coli which causes water borne diseases. By so doing there is Emissions are reduced as the filter displaces use of boiling as a water purification method. Emission Reductions will be monitored annuall and reported. Below is the explanation of how SDG 13 will be monitored.

N_{p,y} Number of person.days consuming water supplied by project scenario p through year y

VPA operators shall conduct baseline surveys to estimate the number of people per household. This value shall be multiplied by the number of days in which the project technology has been in operation beginning with the date of its installation

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

Baseline surveys shall establish the number of households which had access to safe water in the absence of the project activity. This population shall be excluded from the project activity using the correction factor C_j.

B_{b,y} Quantity of fuel consumed in baseline scenario b during the year y in tons

Wood fuel consumption in the baseline scenario shall be back calculated from project scenario water consumption. The total value of water consumed is the sum total of safe water supplied from the project technology as well as raw water boiled. A value has been established to quantify the wood fuel consumption to boil one litre of water.

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

⁹ <https://www.nationalheraldindia.com/india/unemployment-rate-at-3-year-high-in-august-2019-reveal-cmie-data>

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It is assumed that after installation of the filter, none of the households will revert to boiling water. However, during the monitoring survey, a sample of the population identified in the Target Area that has already purchased the filters will be interviewed to analyze if any consumers still practice boiling of raw water for domestic consumptions.

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

During installation of the filter, the installer instructs the customer on the use and maintenance of the filter. The instructions are geared towards reduction of domestic fuel wood consumption and the impracticality of boiling water already treated by the bio sand filter. The value of this parameter is established at 0.

$W_{p, y}$ Quantity of wood fuel or fossil fuel in tons required to treat 1 litre of water using technologies representative of the project scenario p during project year y

A baseline water boiling test was conducted before the project activity begun to accurately determine the wood fuel consumed to boil water in the typical baseline scenario

Calculations

>> Ex-ante emission calculations are calculated in attach emission reductions spread sheet.

Baseline fuel consumption

$$B_{b, y} = (1 - C_j) * N_{j, y} * W_{b, y} * (Q_{j, y} + Q_{j, \text{rawboil}, y}) \quad (\text{Eq 1})$$

Non-Renewable biomass

$$f_{\text{NRB}} = \text{NRB} / (\text{NRB} + \text{DRB}) \quad (\text{Eq 2})$$

Project Scenario Fuel Consumption

$$B_{p, y} = (1 - C_j) * N_{p, y} * W_{b, y} * (Q_{p, \text{rawboil}, y} + Q_{p, \text{cleanboil}, y}) \quad (\text{Eq 3})$$

Baseline Emissions

$$B_{E, b, y} = B_{b, y} * ((f_{\text{NRB}, b, y} * E_{F, \text{fuel}, \text{CO}_2}) + E_{F, \text{fuel}, \text{nonCO}_2}) * \text{NCV}_{b, \text{fuel}} \quad (\text{Eq 4})$$

Project Emissions

$$P_{E, p, y} = B_{p, y} * ((f_{\text{NRB}, p, y} * E_{F, \text{fuel}, \text{CO}_2}) + E_{F, \text{fuel}, \text{nonCO}_2}) * \text{NCV}_{p, \text{fuel}} \quad (\text{Eq 5})$$

Emission Reductions

$$E_{R, y} = (\sum B_{E, b, y} - \sum P_{E, p, y}) * U_{p, y} - \sum L_{E, p, y}$$

2. Application of the monitoring methodology and description of the monitoring plan:

The following monitoring plan has been developed in accordance with Annex 3 of the Technologies and Practices to Displace Decentralized Thermal Energy Consumption (Section III).

1. Monitoring Procedure

The monitoring plan developed for this project requires the continuous and/or periodic updates to the following records;

- a) Total Sales Record
- b) Project Database
- c) On-going Monitoring Survey

Total Sales Record and Project Database are to be updated continuously during the project life. On-going Monitoring Studies will be performed to measure or verify parameter values used in establishing ex ante emissions reductions calculations.

a) Total Sales Record

A sales record will be maintained for all sold biosand water filters by Native Energy and their associated implementation partners who install and maintain them. To ensure accuracy of the records, at the time of installation an interview shall be conducted within the household of the installation to collect user characteristics. This information will be entered into a database shortly after the sale is made and the filter installed and will be maintained by Native Energy.

The sales records will comprise the following data:

Total Sales Record		
Parameter	Description	Entry mode
Date of Sale	Exact date of installation of the BioSand Filter which signifies the beginning of its operational use	DD/MM/YYYY
Geographical Location of Sale	A description of the point of sale including as much as reasonably possible of the county name, district/division name, location and village names	County Name: District Name: Division Name: Location Name: Village Name: ¹⁰
Mode of Use (Domestic)	The individual installing the project technology shall conduct a spot check to record if the filter is installed for domestic or commercial use	Spot check confirmation Household (☐) Commercial (☐)

¹⁰ Different countries have different geographical identification names such as departments, prefectures or municipalities. The geographical definition herein stated is a demonstration only, the VPA operator is at liberty to adapt the geographical reference as needed and adapted to the local situation of the Host country.

Number of Filters Purchased	The individual installing the project technology shall record the number of project technologies sold to the final recipient	Number
Name and Telephone number (for domestic consumers as many as possible)	The individual installing the project technology shall record the name and telephone number ¹¹	Name of final recipient: Telephone number:
Unique filter ID assigned to project technology	The individual installing the project technology shall record the unique ID assigned to the project technology distributed.	Unique Filter Number as it appears on the project technology.
Identification of the individual responsible for installation	The name and contact details of the person responsible for installing the survey and the first instance training on proper use of the project technology	Name: Phone Number:

b) Project Database

The Project Database is a combination of data from the Total Sales Record and Ongoing Monitoring Surveys.

The Project Database will be divided into Baseline Emission Reductions and Project Emission Reductions, based on the results of the Ongoing Monitoring Studies for the Project Scenario. This is done so that emission reductions can be calculated appropriately section by section. Technologies aged beyond their useful lifetime or no longer in use, as established in the usage survey, are removed from the Project Database and no longer credited.

The project database therefore shall include the following parameters:

Project database		
Parameter	Description	Entry Mode
Year x	This parameter shall describe the year in which entries to the project database were made within the crediting period.	DD/MM/YYYY exact start date of the crediting period year x DD/MM/YYYY exact end date of the crediting period year x
Number of Project technologies distributed in year x	This parameter shall draw the total number of project technologies distributed in the	Number (total number of filters sold in year x)

¹¹ Where available

	project technology from the total sales record	
Useful life time of Project technologies sold in year x	This parameter shall state the number of operational years of the project technologies has and evaluate how many operational years the filter has in the crediting period.	Number of operational years (remaining operational life of the filters at the end of Year X): Calculated as Operational Lifetime – Total Time Elapsed of Crediting Period
Number of abandoned or discontinued project technologies	This parameter shall be derived from the usage survey component of the On-going Monitoring Studies to account for the number of project technologies, which are no longer in operational use in the Project Scenario. This value shall be extrapolated across the total number of project technologies distributed in Year X.	Percentage drop off rate
Total number of operational project technologies	This shall be the total number of operational project technologies distributed in the project scenario.	Value = Total number of project technologies distributed *(1-%drop off rate)

c) Ongoing Monitoring Studies

The following ongoing monitoring studies for the water purification project following validation of the associated initial project studies. These monitoring studies will investigate and define parameters that could not be determined at the time of the initial project studies or that change with time.

i.) Monitoring Survey

Will be completed annually, beginning 1 year after project registration

The Monitoring Survey will investigate changes over time in the Project Scenario by surveying end users with project technologies on an annual basis. It provides critical information on year-to-year trends in end user characteristics.

Parameters for assessment include:

- Usage rate in project scenario during Year X
- Quantity of safe water in liters consumed in the project scenario p and supplied by project technology per person per day
- Quality of the treated water
- The raw or unsafe water that is still boiled after installation of the water treatment technology
- Quantity of safe (treated, or from safe supply) water boiled in the project scenario p, after installation of project technology
- Number of persons consuming water supplied by project scenario

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- Number of people employed by the project
- Income generation
- Number of people trained on water, hygiene and sanitation management
- Reduced number of water borne diseases (Skin rash, diarrhea, foot sore and parasites) and Indoor Air Pollution related diseases/infections (itchy eyes, eye problems and incidence of coughing)

Monitoring Survey Representativeness

Monitoring surveys shall draw the sampling frame from the Total Sales Record, which shall have comprehensive follow up information. This data shall have information with regards to the physical location of the final recipient of the project technology. To ensure that the monitoring survey is representative of the geographical location and population of the project activity a probability proportional to size sampling technique shall be employed. The procedure for selecting respondents according to the PPS template is provided in a later section of this monitoring plan.

Monitoring Survey sample sizing and data collection

The monitoring survey will have the same sample sizing and data collection guidelines as the baseline survey. Therefore the sample size is set at 100 sample units and monitoring surveys will be conducted with usage survey participants that are currently using the POU bio sand filters.

ii) Usage Survey

These will be completed annually, or more frequently, and in all cases on time for any request of issuance. The usage survey will provide a single usage parameter that will be weighted based on drop off rates that are representative of the age distribution for project technologies in the total sales record.

A usage parameter will be established to account for drop off rates as this project technology ages and is updated.

Prior to verification, a usage parameter will be required that is weighted to be representative of the quantity of project technologies of each age being credited. For example, if only technologies in the first year of use (age 0-1) are being credited, a usage parameter will be established through a usage survey for technologies aged 0-1. If an equal number of technologies in the first year of use (age 0-1) and second year of use (age 1-2) are credited, a usage parameter is required that will be weighted to be equally representative of drop off rates for technologies age 0-1 and age 1-2.

The minimum total sample size will be 100, with at least 30 samples for project technologies of each age being credited. Interviews in a usage survey will be conducted in person and will include expert observation by the interviewer for spot checks to confirm self-reports within the kitchen in question, while the remainder will be conducted via telephone by the same interviewers on condition that in-kitchen observational interviews are first concluded and analyzed such that typical circumstances are well understood by the telephone interviewers.

The usage parameter will be used to determine the number of operational project technologies. The total percentage of households that completely abandon use of the bio sand filters shall be immediately discontinued from the project activity and therefore not credited.

iii) Project Field Test Update

(Will be completed every other year or more frequently)

The project technology will not have any material changes throughout the crediting period and given the fact that it is a zero energy technology, the PFT will focus primarily on an age test, water quality test and details of increased sales within the crediting period.

iv) Baseline Field Test Update

This project will adopt a fixed baseline and therefore FT updates will not be necessary.

v) Water Consumption Field Test

The WCFT shall be carried out together with the monitoring surveys to ensure that it is representative of the project boundary.

The following parameters shall be identified using the WFCT:

- Quantity of safe water in liters consumed in the project scenario p and supplied by project technology per person per day
- Quantity of raw or unsafe water boiled in the project scenario p per person per day
- Quantity of safe (treated, or from safe supply) water boiled in the project scenario p per person per day
- Number of persons served by the project technology within the household

Data collection shall be based on survey question included in the monitoring surveys. Households will be required to state how much water is treated per day using the project technology as quantified using the capacity of the safe water storage containers or other containers used to transfer water from collection points (such as rivers/canals) to the household. If any, households which still consume raw water shall be required to estimate how much and state reasons for the same, this provision holds true for safe water (i.e. water treated by the project technology and still boiled in the project scenario).

The WCFT will be carried out according to the methodological requirements for all the VPAs under this PoA. The PP has designed the WCFT protocol based on the procedure for conducting the Kitchen Field test in Annex 4 of the methodology as follows:

1. The WCFT will take place over a 4-day period.

2. Day 1: Surveys and Introduction

The PP shall execute Usage surveys, SD assessments and other non-field exercise surveys for the same sampling frame as the WCFT per technology. The PP shall then inform households of the three-day WCFT exercise informing them to treat water as they normally do year round. Households will report on the times at which they treat water every day. The times reported shall be recorded to allow enumerators to go to households the following day before raw water is treated.

3. Day 2 – 4: WCFT exercise

Based on the schedule of respective households' water treatment, enumerators will conduct a volumetric assessment for raw water before it is added to the filter. The enumerator shall record the value of raw water treated prior to filtration. This assessment shall be conducted using standardized volumetric containers. Raw water carried by the households will be measured in these flasks before being filtered through the project technology.

The mean value of the total raw water (the total water filtered per day aggregated over a three day period) will establish the value $Q_{p,y}$ per household. Which will then be aggregated (after elimination of outliers) to determine the value used to calculate Emission Reductions for the whole project per technology.

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The household will then be asked if at all they boil any of the clean water or if they consume any raw water without boiling.

For clean water boiled, ($Q, p, \text{cleanboil}$) the same volumetric assessment will be conducted for the amount of water boiled with the enumerator quantifying how much clean water is boiled prior to the same being added to the boiling pot.

For raw water, ($Q, p, \text{rawboil}$) the volumetric assessment will be conducted prior to the water being added to the boiling pot..

The WCFT will also record on a day to day basis - the number of people living in the household - daily questionnaire/ log entry.

The WCFT shall use questionnaires incorporated into the monitoring surveys to quantify the parameters listed above.

vi.) Leakage Assessment

This will be completed every year, starting on time for the first verification. The following potential sources of leakage will be investigated:

- *The displaced baseline technologies are reused outside the project boundary in place of lower emitting technology or in a manner suggesting more usage than would have occurred in the absence of the project.*

The project activity shall displace the use of boiling and or consumption of raw water in the baseline scenario. Accordingly, households that adopt the project technology shall be assumed (ex-ante) to abandon the use of the two identified baseline practices. Monitored parameters to evaluate whether households continue to boil water have been included in the monitoring plan for the project activity. There is very little likelihood that the displaced baseline technologies/practices would be reused outside the project boundary in place of a lower emitting technology than would have occurred in the absence of the project technology. Therefore, this leakage parameter shall not be monitored.

- *The non-renewable biomass or fossil fuels saved under the project activity are used by non-project users who previously used lower emitting energy sources.*

Households in the project activity are assumed to continue to use fossil fuels to provide other thermal energy requirements like cooking. It is therefore, not likely that project users would completely abandon fuel consumption which would lead to increased consumption of wood fuel by non-project users. This leakage parameter shall not be monitored.

- *The project significantly impacts the NRB fraction within an area where other CDM or VER project activities account for NRB fraction in their baseline scenario.*

As demonstrated in the Emissions Reductions calculation spreadsheet the impact of the project activity on the national NRB fraction, was used in estimating the baseline emissions reductions. The impact of the project activity on the NRB fraction is minimal and therefore this parameter shall not be monitored.

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- *The project population compensates for loss of the space heating effect of inefficient technology by adopting some other form of heating or by retaining some use of inefficient technology*

100% of households surveyed relied on wood fuel as their primary domestic thermal energy source. The introduction of zero energy water filters does not have a considerable impact on the heat produced in households used for space heating for the following reasons:

- Space heating is often as a consequence of leaving ash and wood embers burning overnight after the major thermal needs have been satisfied during cooking. This also occurs as a subsequent effect of space heating during cooking when the majority of household members are in the household before retiring to sleep.

By applying the methodology recommended water boiling test duration of 10 minutes (households typically boil water for 5 - 15 minutes depending on the volume of water lost as well as the amount of available fuel wood), the actual baseline wood fuel consumption for water boiling is very low and therefore would have minimal impact on space heating as compared to other technologies like Improved cook Stoves which do have a direct impact on space heating (USAID 2007)

- There is no real need for excessive space heating in the tropical climates and therefore the contribution of water boiling in this scenario is minimal.
- By virtue of promotion and marketing of a new technology with high efficiency, the project stimulates substitution within households who commonly used a technology with relatively lower emissions, in cases where such a trend is not eligible as an evolving baseline.

The project activity will promote the use of zero energy filters targeted at households who used boiling or raw water consumption as their baseline technologies/practices for water treatment. Any households who used a technology with low (or zero) emissions have been excluded from the project activity. Therefore, this parameter shall not be monitored in the project scenario.

The NRB assessment update will not occur for the project given its fixed baseline and the fact that the project scale (at VPA level) is not large enough to affect the national NRB fraction of the respective host countries.

A.3 Data and parameters fixed ex ante for monitoring contribution to each of the three SDGs

Relevant SDG Indicator	SDG 13: Climate Action Target 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.
Data/parameter	EF _{b,fuel} , CO ₂
Unit	tCO ₂ /TJ
Description	CO ₂ emission factor of the wood fuel
Source of data	IPCC Default emission factors
Value(s) applied	112

Choice of data or Measurement methods and procedures	IPCC default values provide an accurate and conservative estimate of emissions reduction from various fuel sources.
Purpose of data	CO ₂ emission factor of the wood fuel
Additional comment	N/A

Relevant SDG Indicator	SDG 13: Climate Action Target 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.
Data/parameter	EF _{b,fuel,CH₄}
Unit	tCO ₂ /TJ
Description	CH ₄ emission factor of the wood fuel
Source of data	IPCC Default emission factors
Value(s) applied	0.03
Choice of data or Measurement methods and procedures	IPCC default values provide an accurate and conservative estimate of emissions reduction from various fuel sources.
Purpose of data	Calculation of CH ₄ emission factor of the wood fuel
Additional comment	N/A

Relevant SDG Indicator	SDG 13: Climate Action Target 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.
Data/parameter	EF _{b,fuel,N₂O}
Unit	tCO ₂ /TJ
Description	CO ₂ emission factor of the wood fuel
Source of data	IPCC Default emission factors
Value(s) applied	0.004
Choice of data or Measurement methods and procedures	IPCC default values provide an accurate and conservative estimate of emissions reduction from various fuel sources.
Purpose of data	Determining CO ₂ emission factor of the wood fuel
Additional comment	N/A

Relevant SDG Indicator	SDG 13: Climate Action Target 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.
Data/parameter	f NRB _j
Unit	Fraction
Description	Non-Renewable Biomass
Source of data	Literature Review
Value(s) applied	0.91
Choice of data or Measurement methods and procedures	Baseline Survey
Purpose of data	Non-Renewable Biomass
Additional comment	N/A

Relevant SDG Indicator	SDG 13: Climate Action Target 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.
Data/parameter	B _p
Unit	Tonnes
Description	Quantity of fuel consumed in project scenario p during the year y in tons
Source of data	Baseline Survey
Value(s) applied	3.940779915 (To be confirmed during the project scenario)
Choice of data or Measurement methods and procedures	This parameter will be fixed during the first verification review to fulfil an FAR raised by the GS during registration review
Purpose of data	Determining Quantity of fuel consumed in project scenario p during the year y in tons
Additional comment	N/A

Relevant SDG Indicator	SDG 6: Clean Water and Sanitation Target 6.1 : By 2030, achieve universal and equitable access to safe and affordable drinking water for all
Data/parameter:	C _j
Unit	Percentage
Description	Expressed as a percentage, this is the portion of users of the project technology j or who in the baseline were already consuming safe water without boiling it
Source of data	Baseline Survey

Value(s) applied)	Specific for VPA
Choice of data or measurement methods and procedures	At the point of sale baseline surveys will be conducted to establish the percentage of households that relied on boiling water or drank water raw. Households that had alternative water purification methods shall be excluded from the project activity.
Purpose of data	Calculation of baseline and project emissions
Additional comments	N/A

SECTION B Safeguarding Principles Assessment

B.1 Analysis of social, economic and environmental impacts

Assessment to be done at VPA level.

The Assessment for VPA 01 (GS 3964) is as discussed below:

Safeguarding principles	a. Assessment questions	Assessment of relevance to the project (Yes/potentially/no)	Justification	Mitigation measure (if required)
3.1 Human Rights	1. The Project Developer and the Project shall respect internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights.	No	The project respects internationally proclaimed human rights including dignity, cultural property and uniqueness of indigenous people.	There is no mitigation measure selected for this project
	2. The Project shall not discriminate with regards to participation and inclusion.	No	The project is not complicit in Human rights abuses. The project activity shall respect human rights during its operation and there shall be minimal possibility of human right abuses.	There is no mitigation measure selected
3.2 Gender Equality and Women's Rights	1. Is there a possibility that the Project might reduce or put at risk women's access to or	No	The project seeks to promotes gender equality and the	There is no mitigation selected for this safeguarding

	control of resources, entitlements and benefits? 2. Is there a possibility that the Project can adversely affect men and women in marginalised or vulnerable communities (e.g., potential increased burden on women or social isolation of men)? 3. Is there a possibility that the Project might not take into account gender roles and the abilities of women or men to participate in the decisions/designs of the project's activities (such as lack of time, child care duties, low literacy or educational levels, or societal discrimination)?	No No	empowerment of women. The project neither contributes to discrimination against women nor does it reinforce gender-based discrimination and/or inequalities. Both men and women have equal opportunities to participate in decisions for the project activity. Both gender take part in the decision making forums such as the stakeholder consultation forum, training workshops and seminars. These are organised in a context and language they can easily understand. The project ensures that both men and women benefit from the project in that filters are accessible to all. Employment opportunities are also available to both genders without discrimination. The project technology will	principle. No mitigation measure is required. No mitigation measure is required.
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	4. Does the Project take into account gender roles and the abilities of women or men to benefit from the Project's activities (e.g., Does the project criteria ensure that it includes minority groups or landless peoples)?	Yes	improve the livelihood of women by reducing the amount of time and money consumed to get fuel.	No mitigation measure is required.
	5. Does the Project design contribute to an increase in women's workload that adds to their care responsibilities or that prevents them from engaging in other activities?	No	The project activity shall create job opportunities targeted at empowering the women in India by providing a non-traditional yet rewarding opportunity of earning good income while helping nurture their skills and potentials for an entrepreneurial future.	No mitigation measure is required.
	6. Would the Project potentially reproduce or further deepen discrimination against women based on gender, for instance, regarding their full participation in design and implementation or access to opportunities and benefits?	No	The project shall not involve any form of discrimination based on gender, race, religion, sexual orientation or any other basis	No mitigation measure is required.
	7. Would the Project potentially limit women's ability to use, develop and protect	No	The project will not limit women's ability to use, develop and protect the natural resources, instead it will	No mitigation measure is required.

	natural resources, taking into account different roles and priorities of women and men in accessing and managing environmental goods and services? 8. Is there a likelihood that the proposed Project would expose women and girls to further risks or hazards?	No	promote protecting the natural resources by using less fuel for households needs since there will be a shift from boiling water to using the water filter. The project activity will distribute zero energy filters which will displace the practice of boiling water in the households. This will consequently reduce the level of indoor air pollution in the households and all health impacts associated with indoor air pollution.	No mitigation measure is required.
3.3 Community Health, Safety and Working Conditions	The Project shall avoid community exposure to increased health risks and shall not adversely affect the health of the workers and the community	No	The project involves distribution of water filters which aims at reducing exposure to health risks such as water borne diseases and respiratory illnesses associated with Indoor air pollution to the workers and the community at large.	No mitigation measure required
3.4.1 Sites of Cultural and Historical Heritage	Does the Project Area include sites, structures, or objects with historical, cultural, artistic, traditional or religious values or	No	The project area does not include sites, structures, or objects with historical, cultural, artistic,	No mitigation required.

	intangible forms of culture (e.g., knowledge, innovations, or practices)?		traditional or religious values or intangible forms of culture. Rather, the project involves installation of water filters in households.	
3.4.2 Forced Eviction and Displacement	Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)?	No	The project involves installation of filters in households thus it does not require or cause physical or economic relocation of people neither temporarily or permanent.	No mitigation required
3.4.3 Land Tenure and Other Rights	1. Does the Project require any change to land tenure arrangements and/or other rights? 2. Are there any uncertainties with regards land tenure, access rights, usage rights or land ownership?	No	The proposed project activity involves distribution of Hydraid water filters. There shall be no change in land tenure arrangements or involuntary resettlement as a result of implementation of the project activity .	No mitigation measure is required.
3.4.4 Indigenous Peoples	Are indigenous peoples present in or within the area of influence of the Project and/or is the Project located on land/territory claimed by indigenous peoples?	No	The project recognises and respects the rights of indigenous people's and shall seek to respect, protect and conserve the cultural, intellectual, religious and spiritual property of indigenous people. The project involves	No mitigation measure required

			installation of water filters at household level and will therefore have no impact on indigenous people.	
3.5 Corruption	1. The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects.	No	The project is not involved nor complicit or contribute to any acts of corruption	No mitigation measure required
3.6.1 Labour Rights	1. The Project Developer shall ensure that there is no forced labour and that all employment is in compliance with national labour and occupational health and safety laws, with obligations under international law, and consistency with the principles and standards embodied in the International Labour Organization (ILO) fundamental conventions. 2. Workers shall be able to establish and join labour organisations. 3. Working agreements with all individual workers shall be documented and		The project does not involve and is not complicit in any form of forced or compulsory labour. Employment shall be in compliance with laid out national and international laws and procedures. Participation into the project activity shall be voluntary. 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 The PP shall ensure that all the employees'	No mitigation measure requires No mitigation measure required No mitigation measure required

	implemented.		rights are observed.	
	4. The Project Developer shall justify that the employment model applied is locally and culturally appropriate.		The project developer shall ensure proper documentation for all employees including the working agreements. The project developer shall ensure that the employment procedures and model used is locally and culturally appropriate.	No mitigation measure required
	5. Child labour, as defined by the ILO Minimum Age Convention is not allowed.		The project does not employ and is not complicit in any form of child labour. There shall be no employment of children under the age of 14 years, which is the minimum employment age in India ¹² . All employees in the project activity shall be required to enter their age in the employment sheet to ensure that no children under the age of 14 years are	No mitigation measure required

¹² <https://www.prsindia.org/billtrack/the-child-labour-prohibition-and-regulation-amendment-act-2012-2553>

	6. The Project Developer shall ensure the use of appropriate equipment, training of workers, documentation and reporting of accidents and incidents, and emergency preparedness and response measures.		employed. The project provides workers with a safe and healthy work environment and is not complicit in exposing workers to unsafe or unhealthy work environments. All employees in this project activity shall be exposed to a safe and healthy working environment.	No mitigation measure required
3.6.2 Negative Economic Consequences	1. The Project Developer shall demonstrate the financial sustainability of the Projects implemented 2. The Projects shall consider economic impacts and demonstrate a consideration of potential risks to the local economy and how these have been taken into account in Project design, implementation, operation and after the Project	No	The project will be sustained through filter sales and the proceeds received from sale of carbon credits over the 10-year crediting period. This water filtration project generates employment through the sales, supply and installation and during annual monitoring surveys of the hydraid filters.	No mitigation measure is required. No mitigation measure required
4.1.1 Emissions	1. Will the Project increase greenhouse gas emissions over the Baseline Scenario?	No	There are no project emissions in the project activity given that	No mitigation measure is required.

			the project introduces zero energy water filters. These technologies do not use any non-renewable biomass and hence displace the practice of boiling water completely. By reducing the consumption of unsustainably harvested fuel wood GHG emissions are reduced.	
4.1.2 Energy Supply	1. Will the Project use energy from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users?	No	The Hydrad filters operate using a combination of biological and physical processes that does not involve use of energy supply. The project will therefore not use energy from a local grid or power supply.	No mitigation measure is required.
4.2.1 Impact on natural water patterns and flow	1. Will the Project affect the natural or pre-existing pattern of watercourses, ground-water and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?	No	The project activity consists of zero energy Point of Use and Point of Entry water treatment at household levels, that does not impact on natural water patterns. and flow.	No mitigation measure is required.
4.2.2 Erosion and/or water body stability	1. Could the Project directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of	No	Minimization of deforestation in the project boundary will lead to reduction in the occurrence	No mitigation measure is required.

	erosion? If 'Yes' or 'Potentially' proceed to question 2. 2. Is the Project's area of influence susceptible to excessive erosion and/or water body instability?	No	and severity of soil erosion. The project area is not susceptible to excessive erosion or water body instability and the proposed project activity shall not negatively affect soil conditions in the project scenario.	No mitigation measure is required.
4.3.1 Landscape modification and soil	1. Does the Project involve the use of land and soil for production of crops or other products?	No	The project is a water filtration project that aims at providing affordable, clean, efficient and easy-to-use alternative for water purification. It therefore does not involve production of crops neither will it lead to soil degradation.	No mitigation measure is required.
4.3.2 Vulnerability to Natural Disaster	1. Will the Project be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions?	No	The project does not create nor increase vulnerability to natural disasters. The project area is not susceptible to natural disasters such as earthquakes, landslides, flooding or erosion.	No mitigation measure is required.
4.3.3 Genetic Resources	1. Could the Project be negatively impacted by the use of genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial	No	The project activity is a water filtration project and does not involve the use of GMOs in its operations.	No mitigation measure is required.

	development)?			
4.3.4 Release of pollutants	1. Could the Project potentially result in the release of pollutants to the environment?	No	The project activity is a water filtration process that uses a combination of mechanical, biological and physical processes to treat water. No chemicals or hazardous materials are used in this process. The project has therefore no potential of releasing pollutants to the environment.	No mitigation measure is required.
4.3.5 Hazardous and Non-hazardous Waste	1. Will the Project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials?	No	The construction of the water filters involves light manual works and does not involve use of chemicals or other hazardous materials.	No mitigation measure is required.
4.3.6 Pesticides and fertilizers	1. Will the Project involve the application of pesticides and/or fertilisers?	No	The project is a water filtration project that does not use pesticides nor fertilizers.	No mitigation measure is required.
4.3.7 Harvesting of forests	1. Will the Project involve the harvesting of forests?	No	The project Activity actually helps improve natural habitats by reducing the demand for charcoal and wood.	No mitigation measure is required.
4.3.8 Food	1. Does the Project modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives?	No	The project is a water filtration project that aims at providing affordable, clean, efficient and easy-to-use alternative for	No mitigation measure is required.

			water purification. It therefore does not affect crop production, quality, quantity and availability of the same in any way.	
4.3.9 Animal Husbandry	1. Will the Project involve animal husbandry?	No	The project is a water filtration project that aims at providing affordable, clean, efficient and easy-to-use alternative for water purification. It therefore does not involve animal husbandry practices.	No mitigation measure is required.
4.3.10 High Conservation Value Areas and Critical Habitats	Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified?	No	The project 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. The proposed project activity target	No mitigation measure required

			area shall be households.	
4.3.11 Endangered Species	1. Are there any endangered species identified as potentially being present within the Project boundary (including those that may route through the area)?	No	The project activity is a water filtration project which will entail installation of filters at household level. Therefore, the project shall not have any negative impact of any recognised endangered, vulnerable or critically endangered species.	No mitigation measure required
	2. Does the Project potentially impact other areas where endangered species may be present through transboundary affects?	No	The project activity shall not impact on any habitats of endangered species since it entails installation of filters at households.	No mitigation measure required.

SECTION C Monitoring plan

C.1 Data and parameters to be monitored

Relevant Indicator/Safeguarding Principle	SDG SDG 3: Good health and well being Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.
Data / Parameter	Up,y
Unit	Percentage
Description	Usage rate in project scenario p during year y
Source of data	Annual Usage Surveys
Value(s) applied	80%
Measurement methods and procedures	A single usage parameter is weighted to be representative of the quantity of project technologies of each age being credited in a given project scenario.

Monitoring frequency	Monitored Annually
QA/QC procedures	Transparent Data Analysis and Reporting of Annual Usage surveys conducted. Detailed QA/QC procedures are included in the monitoring report
Purpose of data	Calculations of total Emission reductions
Additional comment	N/A

Relevant Indicator/Safeguarding Principle	SDG SDG 3: Good health and well being Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.
Data / Parameter	Quality of the treated water
Unit	Percentage
Description	This parameter will be used to determine the levels of coliforms in the treated drinking water
Source of data	Performance field tests conducted during project studies.
Value(s) applied	80% of households with water having o.Ecoli
Measurement methods and procedures	Aquagenx CBT
Monitoring frequency	Monitored annually
QA/QC procedures	Using Aquagenx toolkit instructional manual for using the CBT. Additionally, conducting extensive training for the monitoring team with regards to the protocol for using the Aquagenx CBT.
Purpose of data	Sustainable Development assessment
Additional comment	N/A

Relevant Indicator/Safeguarding Principle	SDG SDG 3: Good health and well being Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.
Data / Parameter	Np,y
Unit	Person.days
Description	Number of persons consuming water supplied by project scenario p through year y
Source of data	Water consumption field test (WCFT)
Value(s) applied	1,825
Measurement methods and procedures	The date of installation of the filter shall be ascertained from the Total Sales record this shall be used to quantify the number of days in the crediting period within which the filter has been use. The Water consumption field test shall assess the number of household members who have been in use of the project technology.
Monitoring frequency	Biennially monitored

QA/QC procedures	The number of people living in a household during the water consumption field test exercise will be obtained to capture the differences in the household number of people throughout the year.
Purpose of data	Calculation of project emissions.
Additional comment	N/A

Relevant Indicator/Safeguarding Principle	SDG 3: Good health and well being Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.
Data / Parameter	Reduced number of water borne diseases (Skin rash, diarrhoea, foot sore and parasites) and Indoor Air Pollution related diseases/infections (itchy eyes, eye problems and incidence of coughing)
Unit	percentage
Description	This parameter will be collected to indicate the project contributes towards healthy lives and wellbeing.
Source of data	Monitoring Survey
Value(s) applied	Reduced water borne diseases 70% Perceived change in air quality 60%
Measurement methods and procedures	A questionnaire will be administered to households and responses recorded and analysed.
Monitoring frequency	Annual
QA/QC procedures	PD shall submit monitoring survey summary records
Purpose of data	To monitor change in illnesses attributed to exposure to unsafe water, indoor air pollution and lack of sanitation and hygiene
Additional comment	To be monitored annually

Relevant Indicator/Safeguarding Principle	SDG 6: Clean water and sanitation Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all
Data / Parameter	Q _{p,y}
Unit	Litres per person per day
Description	Quantity of safe water in litres consumed in the project scenario p and supplied by project technology per person per day
Source of data	Water consumption field test (WCFT)
Value(s) applied	5 litres
Measurement methods and procedures	Water consumption field tests will be conducted biennially to establish the amount of safe water provided by the project technology. This test will be conducted based on a random sample drawn from the Total Sales Record.
Monitoring frequency	Biennially monitored
QA/QC procedures	Sampling procedure as defined in the general guidelines for sampling and surveys for small-scale CDM project activities ¹³ .

¹³ http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid20.pdf

Purpose of data	Calculation of project emissions. <u>To calculate volume of safe water consumed in the project scenario</u>
Additional comment	N/A

Relevant Indicator/Safeguarding Principle	SDG SDG 6: Clean water and sanitation Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all
Data / Parameter	Q _{p,rawboil,y}
Unit	Litres per person per day
Description	The raw or unsafe water that is still boiled after installation of the water treatment technology.
Source of data	Water consumption field test (WCFT)
Value(s) applied	0
Measurement methods and procedures	Water consumption field tests will be conducted biennially to establish the number of households who still boil water in the project scenario. This test will be conducted based on a random sample drawn from the Total Sales Record.
Monitoring frequency	Monitored Biennially
QA/QC procedures	Sampling procedure as defined in the general guidelines for sampling and surveys for small-scale CDM project activities ¹⁴ .
Purpose of data	Calculation of project emissions.
Additional comment	N/A

Relevant Indicator/Safeguarding Principle	SDG SDG 6: Clean water and sanitation Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all
Data / Parameter	Q _{p,cleanboil,y}
Unit	Litres per person per day
Description	Quantity of safe (treated, or from safe supply) water boiled in the project scenario p, after installation of project technology
Source of data	Water consumption field test (WCFT)
Value(s) applied	0
Measurement methods and procedures	Water consumption field tests will be conducted biennially to establish the amount of water consumed after treatment using the Bio Sand filter in the project scenario. This test will be conducted based on a random sample drawn from the Total Sales Record.
Monitoring frequency	Biennially monitored
QA/QC procedures	Sampling procedure as defined in the general guidelines for sampling and surveys for small-scale CDM project activities.
Purpose of data	Calculation of project emissions.
Additional comment	The water quality tests will be conducted periodically with the Field Tests and surveys.

¹⁴ http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid20.pdf

Relevant Indicator/Safeguarding Principle	SDG SDG 6: Clean water and sanitation Target 6.b: Support and strengthen the participation of local communities in improving water and sanitation management
Data / Parameter	Number of people attending workshops, seminars and trainings organised on water, hygiene and sanitation improvement
Unit	Number of people
Description	This parameter will be collected to indicate the project provides training and workshops to support and strengthen the participation of local communities in improving water and sanitation management.
Source of data	Training Records
Value(s) applied	10
Measurement methods and procedures	Training records
Monitoring frequency	Annual
QA/QC procedures	PD shall submit training records as a support document
Purpose of data	To determine number of people trained by the project on water, hygiene and sanitation improvement.
Additional comment	To be monitored annually

Relevant Indicator/Safeguarding Principle	SDG SDG 8: Decent Work and Economic growth Target 8.5: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.
Data / Parameter	Number of people employed by the project
Unit	Number of people
Description	This parameter will be collected to determine average hourly earnings of female and male employees, by occupation, age and persons with disabilities
Source of data	Employment records
Value(s) applied	5
Measurement methods and procedures	Employment records
Monitoring frequency	Annual
QA/QC procedures	PD shall submit employment records as a support document
Purpose of data	To determine quantitative and qualitative employment opportunities created by the project.
Additional comment	To be monitored annually

Relevant Indicator/Safeguarding Principle	SDG SDG 8: Decent Work and Economic growth Target 8.5: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.
Data / Parameter	Income generation
Unit	Number of people
Description	This parameter will be assessed to analyse the income generated by employees enrolled in the project activity.
Source of data	Employment records

Value(s) applied	Average Monthly income is INR 10000/- per employee Per Month
Measurement methods and procedures	Employment records
Monitoring frequency	Annual
QA/QC procedures	PD shall submit employment records as a support document
Purpose of data	To determine average hourly earnings of female and male employees, by occupation, age and persons with disabilities
Additional comment	The project will ensure equal pay for equal value of work done. To be monitored annually

Relevant Indicator/Safeguarding Principle	SDG SDG 13: Climate Action <i>Target 13.3:</i> Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.
Data / Parameter	Ers
Unit	tCO ₂ e per year
Description	Emission reductions achieved in project scenario p during year y
Source of data	Baseline and monitoring surveys
Value(s) applied	9,762 tCO ₂ e per year
Measurement methods and procedures	Calculations of emission reductions using methodological guidelines
Monitoring frequency	Annual.
QA/QC procedures	Proper data collection during monitoring survey exercise to ensure that Ers achieved are properly calculated
Purpose of data	Calculation of emission reductions achieved by the project per year.
Additional comment	N/A

Relevant Indicator/Safeguarding Principle	SDG SDG 13: Climate Action <i>Target 13.3:</i> Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.
Data / Parameter	LE _{p,y}
Unit	tCO ₂ e per year
Description	Leakage in project scenario p during year y
Source of data	Baseline and monitoring surveys
Value(s) applied	0
Measurement methods and procedures	In accordance with the methodology an assessment of all project scenarios which would result in leakage emissions has been conducted. Accordingly, there are no potential leakage emission sources arising. However, this parameter will be monitored to analyse any variance in See section B.3 of this P.D.D.
Monitoring frequency	Parameter to be monitored every two years.
QA/QC procedures	There are no perceived leakage risks for this project as explained in section B.3 of the PDD.
Purpose of data	Calculation of project emissions.

Additional comment	N/A
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C.1.1 Other elements of monitoring plan (if applicable)

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Sampling Plan

1. Definition of Terms

Sample: "A sample is a subset of a population". In the PoA the sample shall be defined as the selected sub set derived from all the end users of the Concrete and Hydrad BioSand filters distributed in the PoA.

Parameter: "A characteristic of the population". Within the PoA there shall be several parameters of interest other than the number of operational filters in the PoA. These parameters are unknown at the time of development of this PoA and therefore a representative sample shall be used to determine this parameter and the value so obtained shall be used in calculation of VERs realized in the proposed PoA.

These parameters shall include:

- Quantity of safe water consumed in the project scenario for the BioSand filters
- Quantity of clean water from the BioSand filters which is boiled in the project scenario before consumption
- Quantity of raw water boiled in the project scenario for domestic consumption
- The quality of water treated using the zero energy BioSand filters
- Usage rate of filters distributed in the PoA

Data types: Proportion values "values (that) are derived from data that are described as attributes, yes/no data or binary data" and mean values for quantity assessments. Parameters of interest such as the usage rate and spot checks of proper use and maintenance of the filters as would be used to determine the quality of water treated is determined based on questionnaires and spot checks therefore it is applicable as a proportion value.

However mean values shall be used to determine an aggregate value of the quantifiable parameters of interest such as quantity of water treated, raw water boiled, and clean water boiled.

The parameter estimates that are calculated from the sample data should be:

(a) Unbiased

(b) Reliable

An unbiased estimate is one that does not systematically underestimate or overestimate the parameter value it is representing. Non-sampling errors are a main cause of estimates being biased. Non-sampling errors arise due to various causes right from initial stage when the survey is being planned and designed to the final stage when data are processed and analyzed.

Brieumer and Lyberg (2003) identify five components of non-sampling error, namely specification, frame, non-response, measurement and processing error¹⁵.

Non-Sampling Source	Error	Definition	Mitigation
Specification error		This occurs when the concept implied by the question is	The questions in the questionnaire shall assess the frequency of use of

¹⁵ http://unstats.un.org/unsd/demographic/meetings/egm/Sampling_1203/docs/no_7.pdf

	different from the underlying construct that should be measured.	the filters followed by a spot check to identify that the filter is in operational order and that the filter has unique identification which identifies it and the final recipient as described in the VPA distribution records. Questions shall be defined in simple and concise language so as to allow the interviewer to accurately gauge the parameters of interest while in the field.
Coverage or frame error	The demarcation of sample clusters is not properly carried out during census mapping (sampling plan design) thus households may be omitted or duplicated in the second stage frame.	A multi stage cluster approach has been selected and shall be described in this sampling plan. Accordingly, to eliminate the probability of this non-sampling error, the unique identification of filters and final recipients shall be cross checked to ensure that no filters are surveyed twice. The sampling frame shall be created from distribution data and subsets shall be randomly identified from the total distribution record this will mitigate the possibility of non-coverage or omission of subsets from the sample. Probability to proportion sizing of the sample has been used to ensure equal distribution of respondents across the sampling frame.
Non-response	Non-response refers to the failure to measure some of the sample units. Thus, failure to obtain observations on some units selected for the sample	To mitigate this non-sampling error the following measures shall be instituted: • Develop a good sampling frame. A sampling frame shall be developed to account for all possible parameters that will enable the VPA operator/ CME to identify and track filters and their final recipients. • Interview training, selection and supervision. Enumerators/ surveyors shall be trained on best practice to increase response in the field. Interviewers shall also be categorized according to the physical geographical region in which they operate

		so as to reduce the possibility of non-response because of respondents being interviewed by surveyors who cannot respond to local circumstances and language. There shall also be close supervision of interviewers.
Measurement error	These errors arise from the fact that what is observed or measured departs from the actual values of sample units. These errors center on the substantive content of the survey such as definition of survey objectives, their transformation into usable questions, and the obtaining, recording, coding and processing of responses. These errors concern the accuracy of measurement at the level of individual units.	To mitigate this risk, the interviewers shall be trained before the survey process commences and thereafter in analysis of data collected. Questionnaires shall be made as simple as possible for interpretation of the interviewers and respondents while addressing all parameters that seek to derive information on the parameter of interest.
Processing errors	Processing errors comprise - Editing errors. - Coding errors. - Data entry errors. - Programming errors et	Questionnaires shall be simplified as much as possible to have multiple choice scenarios so as to eliminate the risk of optional responses that vary between respondents. The parameter of interest shall be a binary response (either yes/no).

The reliability of a sample-based estimate directly increases with the numerical size of the sample and inversely with the variability of the parameter in the population to be sampled. Thus, prior to drawing a sample, project participants should calculate the size required to achieve a required level of reliability based on a forecast or expectation of the variability of the parameter in the population.

Desired precision/Expected Variance and Sample Size

The sampling size is determined by minimum 90% confidence interval and the 10% maximum error margin; the size of the sample shall be no less than 100;

The sample size shall be determined based on the following criteria¹⁶:

1. The level of precision,
2. The level of confidence or risk,
3. The degree of variability in the attributes being measured

Level of Precision

The precision level is fixed at 10%.

The Level of Confidence or Risk

¹⁶ http://www.soc.uoc.gr/socmedia/papageo/metaptyxiakoi/sample_size/samplesize1.pdf

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Applying a confidence level of 90% a standard normal of 1.645 will be used in computation of the sample size¹⁷.

The Degree of Variability

To be conservative this sampling plan shall assume a maximum variability of 50%.

Therefore, applying these parameters, the sample size shall be calculated as follows

$$n_0 = \frac{Z^2 pq}{e^2}$$

Where n_0 = the sample size

Z = standard normal of 1.645

P= Degree of Variability (0.50)

q = is the estimated proportion of an attribute that is not present in the population (0.50)

e = precision level (0.10)

Therefore, the sample size $n_0 = 68$ ¹⁸

However, the methodology does require that sample sizes be greater than or equal to 100.

To account for non-response and to meet the methodological requirement of a minimum sample size of 100, the VVB shall employ an oversampling technique where the sample size shall be increased by 30% to have a total sample size of 130 subsets for the purpose of verification.

Sampling Objective

The objective of the sampling is to accurately determine the identified parameters of interest. The target population is the end users of the distributed filters.

Field Measurement Objectives and Data to be collected

Monitoring surveys shall seek to establish the following parameters:

1. Unique Identification of the VPA
2. Unique Identification of the BioSand Filter
3. Proper usage and maintenance of the filters (spot check)
4. Date of survey
5. Physical location of domestic/non-residential setting of filter owner
6. Date of sale/distribution of the filter

The method of data collection shall be closed questionnaires and physical spot checks by the interviewer.

Target Population and Sampling Frame

The Total Sales Record which shall be used to unambiguously trace the end users of the filters. This list shall be used to draw a sampling frame. All sampling frames shall be produced in electronic copies which shall be used to uniquely identify the location and final recipient of the filters.

Sample Method

¹⁷ <http://www.stat.yale.edu/Courses/1997-98/101/confint.htm>

¹⁸ <http://www.raosoft.com/samplesize.html>

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The sampling method chosen for VPAs implemented under this PoA is systematic sampling. Accordingly, the sales/distribution data shall identify the various geographical zones within the VPA and these will be further split into various geographical clusters thereafter a random sample of owners of the filters shall be identified.

The VPA operator shall rely on probability proportional to size systematic sampling approach. Accordingly, the following steps shall be taken in the analysis of the sales record maintained by the VPA

1. List all the geographical regions (counties/districts) in the total sales record and list the number of filters sold in this region
2. Calculate a cumulative sum of all the filters sold, where the last number in this series shall be the total number of filters sold
3. A sample size of 130 has been determined for each VPA (see below on calculation of the sample size).
4. The total number of filters shall then be divided by the sample size (130). The result shall be used to determine the Sample Interval.
5. At random a number between 1 and the Sample Interval (SI) shall be chosen this shall be held as the Random Start (RS)
6. Sample units (SU) shall be identified as follows
 - a. $SU_1 = RS$
 - b. $SU_2 = RS + SI$
 - c. $SU_3 = RS + 2SI$
 - d. $SU_n = RS + (n-1) SI$
7. These sample units (SI) correspond to an identified household in the cumulative sales in the Sales Record

Example of a typical Record Systems for sampling in the VPA:

Geographical Location	Number of Units Sold in the Region	Cumulative Number of Filters Sold
A	1000	1000
S	234	1234
D	4567	5801
F	342	6143
G	456	6599
H	677	7276
J	8990	16266

Total number of filters Sold = 44,319

Sample size = 130

SI= 341

RS = 178

Randomly selected households will include the following based on this calculation:

$SU_1 = 178$

$SU_2 = 519$

$SU_3 = 860$

$SU_{130} = 44,167$

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It is important that the sample unit number selected correspond to the exact number that in the sales record such that this value will be used to select the household with details of location, name and contact references of the customer.

Procedures for Administering Data Collection

Procedures for Data Collection

Trained surveyors will conduct closed questionnaires to identify the stated parameters. This data will then be stored electronically and advanced to from the VPA operator for secondary storage on the C/ME database. One trained surveyor shall conduct the sampling for the cluster assigned.

Training can be conducted by the VPA operator or a relevant institution familiar with conducting household surveys. Training shall be centered on the project activity, the necessity for a closed questionnaire, contacting filter owners and the expected time frame within which the surveys need to be collected and reported. To maximize field responses the minimum sample size has been set at 130 this is a corrective measure by way of over-sampling, any respondents who cannot be traced will be deleted from the secondary unit lists in the particular geographical sample. An increase of 30% is common practice to account for non-response¹⁹. The survey is conducted by site visits with closed questionnaires for the observational units who are household members and spot checks for the functioning of the filters and only persons over age 12 are interviewed. Where the household members present are children under 12, the surveyors will have to conduct a repeated visit and where there are no older respondents, then the sample unit shall be treated as non-responsive.

Quality Control and Assurance

The CME shall ensure that the steps outlined in this monitoring plan have been followed in by the VPA operator in the monitoring surveys using VPA monitoring reports. Any inconsistencies will have to be justified in advance by the VPA operator. Whereas the VPA operator has a minimum sample size of 130 to account for non-response, 100 surveys with complete response must be carried out. If the sample drawn gives a non-response for more than 100 households a different sample within the same geographical region must be selected and the process repeated.

The VPA operator will have to facilitate training of or recruit trained surveyors for the monitoring surveys. However, all training records or backgrounds highlighting the relevant experience of the personnel selected for the survey must be provided to the C/ME.

Implementation

Each micro scale VPA included in the proposed PoA shall be required to produce monitoring reports yearly which provide the data established in the monitoring plan of this PoA DD. This data shall be collated and stored in the CME database. The Gold Standard, through its verification process shall then sample a population of filters within the PoA to determine the accuracy of sales records as well as to verify stated parameters of interest as required by the baseline and monitoring methodology.

Implementation schedule:

1. Collation of VPA databases:
 - a. CME shall collate all VPA databases and organize the same into a central CME database
 - b. The CME shall review VPA databases to ensure there is minimal chance of VPA database having erroneous data entries such as double counting of filters

¹⁹ http://www.soc.uoc.gr/socmedia/papageo/metaptyxiakoi/sample_size/samplesize1.pdf

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2. The CME shall ensure that ex-post monitoring surveys have been conducted following the general guidelines for monitoring and usage surveys included in this PoA DD.
3. Interviewers selected for the ex-post monitoring shall receive training before hand as well as field scenario demonstrations on the applicability of the interviews to provide adequate opportunity for the interviewers to understand the questionnaires as well as assess the interviewer's ability to interpret the data required objectively to the respondent.
4. Monitoring surveys from VPAs shall be collated and this data base shall be provided to the Gold Standard for verification. The Gold Standard shall examine the general VPA databases as well as results from the monitoring surveys and then if the Gold Standard so chooses; conducts a separate field tests/site visits to assess the accuracy of the monitoring surveys. As a single monitoring plan has been selected the result from the sample of filters verified shall be extrapolated to the entire PoA.

C.2. Management system

>> Description of the operational and management arrangements established by the coordinating/managing entity for the implementation of the PoA, including:

- (i) A record keeping system for each technology or practice under the PoA,

As CME Native Energy will need to maintain a record keeping system that adequately tracks each VPA and all project technologies distributed therein. Therefore, it is important to define all points of contact between all the related parties and the information that will be recorded at such contact points.

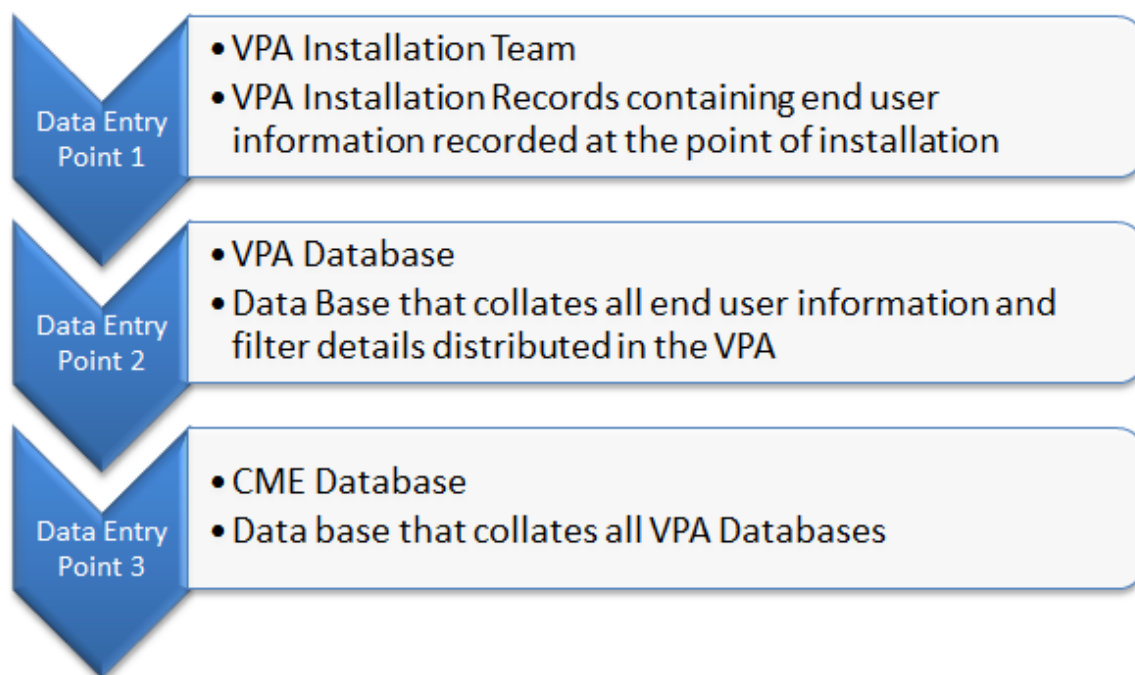


Figure 6: Schematic overview of Data Recording Points within PoA

The schematic diagram above provides an overview of data and information in the PoA from the initial point of installation to the final receipt of complete databases submitted to the Gold Standard.

VPA Installation teams shall distribute the BioSand filters and at this point collate all end-user characteristics, which shall be entered into the VPA Installation Records. The VPA Implementer (also referred to as a VPA Operator) shall then enter all the collated data into the prescribed database templates into the VPA Database. VPA Databases shall then be submitted to the CME (Native Energy) who shall store all the individual databases into the CME Database, which shall then be submitted periodically to the Gold Standard for verification purposes.

Databases shall be in a prescribed format established in the monitoring plan described in section D.7.2 of the Micro-Scale PoA.

- (ii) A system/procedure to avoid double accounting e.g. to avoid the case of including a new VPA that has been already registered either as a project activity with GS or any other standard or as a VPA of another PoA,

All project technologies to be introduced in this project shall be tracked from the point of manufacture to delivery at the end user. Accordingly, a serial number shall be placed on each filter. At the time of entry to the project activity area, the serial number of the filter shall be tracked for monitoring under the PoA. The serial number shall be matched to the end user details. No filters shall be entered into the VPA database or credited if they have the same serial number. As the products to be installed are manufactured before distribution, there is no possibility that the same filters have been credited in another CDM or Voluntary PoA or stand-alone project activity.

- (iii) The provisions to ensure that those operating the VPA are aware of and have agreed that their activity is being subscribed to the PoA;

For all VPA Implementers a contractual agreement shall be entered between the VPA operator and the CME which shall have an express provision attesting the VPA operator's consent to voluntarily participate in the PoA as well as the other requirements expressed in Section A.3 of this PoA-DD.

SECTION D Duration and crediting period

D.1 Duration of project

D.1.1 Start date of project

04/12/2014

D.1.2 Expected operational lifetime of project

>> 28 years for the PoA (renewable every 7th year, 3 times)

D.2 GS Crediting period of the project/activity

>>01/05/2019-30/04/2029(10 years fixed)

D.2.1 Start date of the ongoing GS crediting period

>> 01/05/2019

D.2.3 End date of the ongoing GS crediting period

>> 30/04/2029

D.2.4 Total length of the GS crediting periods

10 years fixed (for the VPA)

SECTION E Stacking of new assets

The project does not seek to stack new assets.

Appendix 1. Contact information of project participants

Organization name	Native Energy
Registration number with relevant authority	103000000001643
Street/P.O. Box	3 Main Street
Building	Suite 212
City	Burlington
State/Region	Vermont
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Country	USA
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E-mail	tom.stoddard@nativeenergy.com
Website	www.nativeenergy.com
Contact person	
Title	Vice President and General Counsel
Salutation	Mr.
Last name	Stoddard
Middle name	
First name	Tom
Department	Management
Mobile	
Direct fax	
Direct tel.	
Personal e-mail	