



MONITORING REPORT

PUBLICATION DATE 14.10.2020 VERSION v. 1.1 RELATED SUPPORT - TEMPLATE GUIDE Monitoring Report v. 1.1

This document contains the following Sections

Key Project Information

- SECTION A Description of project
- **SECTION B** Implementation of project
- SECTION C Description of monitoring system applied by the project
- SECTION D Data and parameters
- SECTION E Calculation of SDG Impacts
- SECTION F Safeguards Reporting
- SECTION G Stakeholder inputs and legal disputes

KEY PROJECT INFORMATION

Programme of Activity Information

GS ID of Programme	GS11450
Title of Programme	MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India
Version of POA-DD applicable to this monitoring report	4.0
Name and GS ID of fully Validated CPA/VPAs (i.e. non compliance check)	NA

Key Project Information

GS ID (s) of Project (s)	GS11490, GS11489
Title of the project (s) covered by monitoring report	GS11450 - MicroEnergy Credits - Microfinance for Clean Energy Product Lines - India - MicroEnergy Credits PoA - VPA - 33- GS11490 GS11450 - MicroEnergy Credits - Microfinance for Clean Energy Product Lines - India - MicroEnergy Credits PoA - VPA - 34- GS11489
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	VPA33 – 3 VPA34 – 2
Version number of the monitoring report	2.0
Completion date of the monitoring report	05-09-2023
Date of project design certification	17/04/2023
Date of Last Annual Report	NA
Monitoring period number	2 nd
Duration of this monitoring period	01/01/2022 to 31/12/2022 (inclusive of both days) Monitoring period falls under crediting period: CP1: VPA 33: 21/12/2019 to 20/12/2024

Gold Standard[®]

	CP1: VPA 34: 21/12/2019 to 20/12/2024
Project Representative	Micro Energy Credits Corporation Private Limited
Host Country	India
Activity Requirements applied	 Community Services Activities Renewable Energy Activities Land Use and Forestry Activities/Risks & Capacities N/A
Methodology (ies) applied and version number	AMS-I.A "Electricity generation by the user" (Version 14) Emission Reduction from safe drinking water supply v1.0
Product Requirements applied	 GHG Emissions Reduction & Sequestration Renewable Energy Label N/A

Table 1 - Sustainable Development Contributions Achieved

Sustainable Development Goals Target	t ed	SDG Impact	Amount Achieved	Units/ Products
13 Climate (mandatory)	Action	Number of VERs (WPS)	VPA 33 – 2273 VPA 34 – 0	tCO2e VERs
13 Climate (mandatory)	Action	Number of VERs (SLS)	VPA 33 - 73,617 VPA 34 -34,320	tCO ₂ e VERs

		Number	of	VERs	VPA33- 75,890	
		(SLS+WPS)		VPA34- 34,320	
		Number of V	VPS distr	ibuted	VPA 33 - 72.08%	Percentage
		under the	project	as an	VPA 34 - 0	
1	No Poverty	indicator of	providing	g basic		
		service	access	to		
		households				

6 Clean Water and Sanitation	Number of households served with safely managed water services	VPA 33 - 917 VPA 34 - 0	Number
7 Affordable and Clean Energy	Number of households having operational clean energy product (WPS)	VPA 33 - 979 VPA 34 - 0	Number
7 Affordable and Clean Energy	Number of households having operational clean energy product(SLS)	VPA 33 - 209,526 VPA 34 - 98,261	Number
8 Decent Work and Economic Growth	Quantitative Employment and income generation	VPA 33 - 68 VPA 34 - 27	Number

Table 2 – Product Vintages

		Amount Achieved			
Start Dates	End Dates	VERs			
01/01/2022	31/12/2022	Tech	VPA33	VPA34	
		WPS	2273	0	
		SLS	73,617	34,320	
		Total	75,890	34,320	

SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

>>

In the rural areas of India, the predominant means of drinking water is by boiling using traditional cook stoves that use woody biomass as fuel. The smoke and fumes from these stoves contribute heavily to indoor air pollution. In rural areas of India, households are either not connected to the grid or in households even with grid connectivity, there are frequent power outages and low voltage so rural households

must use kerosene for indoor lighting, which also contributes to indoor air pollution and GHG emissions.

The VPA involves marketing, education, distributing, and financing solar lighting systems, and water purification devices for low-income households and microentrepreneurs in India. Micro Energy Credits Corporation Private Limited is the Coordinating and Managing Entity of this PoA and coordinates efforts of VPA implementers to distribute Clean Energy Products in India.

These products provide clean drinking water and renewable energy for lighting. The water purification devices distributed under the proposed VPA replace traditional cookstoves thereby eliminating the use of fuelwood for boiling raw water in the baseline by households and thus reducing GHG emissions corresponding to the fuelwood saving by the project activity. The solar lighting systems replace kerosene-based lamps in households, which would have resulted in GHG emissions due to burning of fossil fuel i.e., kerosene.

The program is a voluntary initiative coordinated by Micro Energy Credits Corporation Private Limited (MEC), the CME of the PoA, and implemented by MEC's Partner Organizations (PO). The Water Purification system are implemented by- Midland Microfin Ltd. (Midland) and solar lighting system are implemented by - Greenlight Planet India Pvt. Ltd. (GLP), Satin Creditcare Network Ltd. (Satin), Midland Microfin Ltd. (Midland), and Arman Financial Services Limited (Arman).

Under this VPA, MEC works with project partners to develop a successful and diversified clean energy-lending program. The clean energy program addresses typical barriers for low-income clients including education, price, finance, and supply and aftersales service. MEC trains project partners to implement the clean energy lending program, as well as a robust and transparent carbon credit monitoring and tracking system to quantify and record the volume of carbon emission reductions created through the clean energy program. The carbon finance is used to expand and sustain the clean energy program through:

- 1. Client education and marketing
- 2. Internal training and capacity building
- 3. On lending funds to local SMEs producing the clean energy products
- 4. Aftersales service and maintenance
- 5. Lowering the interest or principal cost to the client

The goal of the VPA is to use carbon finance to enable installations of solar lanterns, and water purifiers in India.

A.2. Location of project

>>

VPA33-GS- 11490

a. Host Party (ies) - India

b. Region/State/Province – Bihar (BH), Haryana (HR) and Punjab (PJ) States for water filter. For solar lighting systems, several states, such as Assam (AS), Bihar (BH), Haryana (HR), Meghalaya (MG), Rajasthan (RJ), Punjab (PJ), West Bengal (WB), Chhattisgarh (CG), Jharkhand (JK), Jammu & Kashmir (J&K), Karnataka (KA), Maharashtra (MH), Tripura (TR), Madhya Pradesh (MP), Odisha (OD), Uttarakhand (UK) and Uttar Pradesh (UP) and many regions within those states are included.

VPA34- GS11489

a. Host Party (ies) - India

b. Region/State/Province – For solar lighting systems, several states, such as Assam (AS), Bihar (BH), Gujarat (GJ), Haryana (HR), West Bengal (WB), Chhattisgarh (CG), Jharkhand (JK), Karnataka (KA), Telangana (TL), Maharashtra (MH), Tripura (TR), Madhya Pradesh (MP), Odisha (OD), Punjab (PJ), Rajasthan (RJ), Tamil Nadu (TN), and Uttar Pradesh (UP) and many regions within those states are included.

c. City/Town/Community – Several Cities/Towns are included

d. Physical/Geographic location – The exact location (Address) of each CEP is captured in the Credit Tracker Platform and can be verified

The location of each clean energy installation as per a GPS location or verified address will be recorded in Micro Energy Credit's Credit Tracker Platform, which has been designed specifically for accelerating microfinance access to clean and efficient energy. These locations will define the more precise boundary of the project activities.

The Credit Tracker Platform is used to collect and store the information related to the unique identification number, location, installation date, and usage status of each clean energy product in the VPAs, making it easy to identify, locate and verify any or all of the installations that pertain to the VPAs. The MEC Credit Tracker Platform is a hosted internet service, limiting the risk of loss of data.



Figure 1: Map of India

A.3. Reference of applied methodology

>>

Solar Lighting System: AMS-I.A "Electricity generation by the user, version 14¹ Water Purification System: Methodology for Emission Reductions from Safe Drinking

\

Water Supply (Version 1.0)²

CDM tool 30: Calculation of the fraction of non-renewable biomass v3.0

² AMS I.A version 14.0

² Safe Water Meth v1.0

A.4. Crediting period of project

>>

VPA Reference Number	Crediting Start Date	GS4GG Crediting End Date	GS4GG Eligible Crediting End Date ³
GS11490	21/12/2019	20/12/2024	20/12/2034
GS11489	21/12/2019	20/12/2024	20/12/2034

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

>>

VPA GS ID	VPA Title
GS11490	GS11450 - MicroEnergy Credits - Microfinance for Clean Energy
	Product Lines – India - CPA 33 - GS11490
GS11489	GS11450 - MicroEnergy Credits - Microfinance for Clean Energy
	Product Lines – India - CPA 34 - GS11489

VPA33 - GS ID: GS 11490

a. Purpose of the VPA(s) and the measures taken for GHG emission reductions or net anthropogenic GHG removals-

<u>Purpose</u>: Under the VPA, Micro Energy Credits works with PO –Greenlight Planet India Pvt. Ltd. (GLP), Midland Microfin Ltd. (Midland), Satin Creditcare Network Ltd. (Satin) to develop a successful and diversified clean energy lending program. The clean energy program addresses typical barriers for low-income clients including education, price, finance, and supply and aftersales service. Micro Energy Credits trains the POs to implement the clean energy lending program, as well as a robust and transparent carbon credit monitoring and tracking system to quantify and record the volume of carbon emission reductions created through the clean energy program.

³ As these are CDM Transitioned projects, GS4GG allows a total crediting period of 15-years from the CDM crediting start date.

<u>Measures taken</u>: The VPA involves marketing, distributing, financing solar lighting systems and water purification systems for low-income households and microentrepreneurs in different states of India. These products provide renewable energy for lighting and safe drinking water. The total number of units implemented under this VPA till date is:

Solar Lighting systems – 214,519 Water purification systems – 1,248

Year	Water Purifiers	Solar Lighting System
2017	646	177
2018	297	94,177
2019	305	120,165
Total	1,248	214,519

No further sales have been added during the current monitoring period i.e. 01/01/2022 to 31/12/2022.

Description of the installed technology, technical processes and equipment for the VPA –

• Eureka Forbes Nakshatra

The Eureka Forbes Limited (EFL)-Aquasure Nakshatra is a medium size purifier with a 16-litre capacity (Top-8.5-litre, Bottom- 7.5-litre). AquaSure Nakshatra Storage Water Purifier is a gravity-based purifier and made of food grade material. Halopure disinfection technology used in it

The technical specifications of the water purifier are as follows – Size – 51 cm X 26 cm X 26 cm Net weight: 2.38 kg Flow Rate: 9I/h Warranty Period- 2 years

Average life span under standard use conditions: The life span of the cartridge used by the purifier has a capacity of 4000 I after which it must be replaced. This product comes with one additional cartridge of 4000 I capacity. The life of the kit therefore depends on how much water is purified by the user every day⁴.



• HUL Pureit classic

The technical specifications⁵ of the water purifier are as follows –

Size – 61 cm X 29 cm X 21 cm Net weight: 4.1 kg Flow Rate: 10l/h Warranty period – 2 years US EPA and National Standard Approved

Average life span under standard use conditions: The life span of the germ kill kit used by the purifier has a capacity of 1500 I after which it must be replaced. The life of the kit therefore depends on how much water is purified by the user every day^{6} .



Solar Lighting System

The solar lighting system models implemented under this VPA and their technical specifications are as follows -

d.light S550
 Luminosity – 240 lumen
 Lighting Wattage – 3 Watt
 Average Lifetime of product (in years) –
 Module – 15 years
 Battery – 5 years
 Electronics – 5 years

Greenlight Planet Boom (Sunking Boom)
 Luminosity – 160 lumen
 Lighting Wattage – 3 Watt

Average Lifetime of product (in years) – Module – 15 years Battery – 8 years Electronics – 5 years

3. Greenlight Planet Pro 200 (Sunking Pro 200)
Luminosity – 200 lumen
Lighting Wattage – 1.25 Watt
Average Lifetime of product (in years) –
Module – 10 years
Battery – 5 years
Electronics – 5 years

4. Jugnu TWP29004
Luminosity – 90 lumen
Lighting Wattage – 1 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

Jugnu TWP29006
Luminosity – 200 lumen
Lighting Wattage – 2 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

6. Jugnu TWP29008
Luminosity – 400 lumen
Lighting Wattage – 4 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

Gold Standard

7. Greenlight Planet Pico (Sunking Pico)
Luminosity – 25 lumen
Lighting Wattage – 0.17 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 5 years
Electronics – 5 years

8. d.light D333
Luminosity – 520 lumen
Lighting Wattage – 6.6 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 5 year
Electronics – 5 years

9. d.light S500
Luminosity – 240 lumen
Lighting Wattage – 3 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 5 years
Electronics – 5 years

10. Jugnu 2 Tubelight
Luminosity – 440 lumen
Lighting Wattage – 4 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

11. Jugnu Lightbox L1406 Luminosity – 140 lumen Lighting Wattage – 1.5 Watt

Gold Standard

Average Lifetime of product (in years) – Module – 15 years Battery – 8 year Electronics – 5 years

12.Jugnu Lightbox L2005 Luminosity – 200 lumen Lighting Wattage – 1.8 Watt Average Lifetime of product (in years) – Module – 15 years Battery – 8 years Electronics – 5 years

13. Greenlight Planet Home 40Z (Sunking Home 40Z)
Luminosity – 250 lumen
Lighting Wattage – 1.68 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 5 years
Electronics – 5 years

14. Greenlight Planet Pro X Plus (Sunking Pro X plus)
Luminosity – 240 lumen
Lighting Wattage – 1.5 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 5 years
Electronics – 5 years

The luminosity (in Lumens) of the systems given above is as per the manufacturer's specifications. However, a cap of 140.538 Lumens is applied for the purpose of calculating emission reductions. For solar lighting system models with luminosity higher than 140.538, the cap of 140.538 Lumens is used to calculate emission reductions. For solar lighting system, models with luminosity less than the cap of 140.538 Lumens, the actual (lesser) value is used to calculate the emission reductions.

c. Relevant dates for the VPA -

- 1. Construction/Implementation date The solar lighting systems are implemented from 31/07/2017 to 20/07/2019. The water purifiers are implemented from 09/02/2017 to 29/06/2019.
- Commissioning 214,519 solar lighting systems are distributed till date under this VPA. 1,248 water purifiers are distributed till the end of monitoring period under this VPA. The exact commissioning/installation dates for all the CEPs are mentioned in the Emission Reduction Calculation sheet for this VPA.
- Continued operation periods All of the functional products were continuously operational during the course of this monitoring period. Non-functional products are discounted in emission reduction calculation. Details of the Usage rates are mentioned in the Section D.2

d. Total GHG emission reductions achieved in this monitoring period for the VPA, including information on how double counting is avoided -

The total GHG emission reduction achieved in this monitoring period for the VPA is 75,890 tCO $_2$ e.

VPA34 - GS ID: GS 11489

a. Purpose of the VPA(s) and the measures taken for GHG emission reductions or net anthropogenic GHG removals-

<u>Purpose</u>: Under the VPA, Micro Energy Credits works with PO – Arman Financial Services Limited (Arman) and Greenlight Planet India Pvt. Ltd. (GLP) to develop a successful and diversified clean energy lending program. The clean energy program addresses typical barriers for low-income clients including education, price, finance, and supply and aftersales service. Micro Energy Credits trains the POs to implement the clean energy lending program, as well as a robust and transparent carbon credit monitoring and tracking system to quantify and record the volume of carbon emission reductions created through the clean energy program.

<u>Measures taken</u>: The VPA involves marketing, distributing, financing solar lighting systems and water purification systems for low-income households and microentrepreneurs in different states of India. These products provide renewable energy for lighting and safe drinking water. The total number of units implemented under this VPA till date is:

Solar Lighting systems – 1,02,220

Water purification systems – No water filters being installed till the end of monitoring period

Year	Solar Lighting System
2017	9,843
2018	56,848
2019	35,529
Total	102,220

No further sales have been added during the current monitoring period i.e. 01/01/2022 to 31/12/2022.

Description of the installed technology, technical processes and equipment for the VPA –

Water Purifier:

No water purifier installed till the end of the monitoring period.

Solar Lighting System

The solar lighting system model implemented under this VPA and their technical specifications are as follows -

Greenlight Planet Home Lighting System (Sunking HLS)
 Luminosity – 400 lumen
 Lighting Wattage – 2.64 Watt
 Lifetime of product (in years) –
 Module – 15 years
 Battery – 8 years
 Electronics – 5 years

2. Greenlight Planet Home Lighting System 120 (Sunking HLS120)
Luminosity – 590 lumen
Lighting Wattage – 5.28 Watt
Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

3. Greenlight Planet Home 40Z (Sunking Home 40Z)
Luminosity – 250 lumen
Lighting Wattage – 1.68 Watt
Lifetime of product (in years) –
Module – 15 years
Battery – 5 years
Electronics – 5 years

4. Greenlight Planet Boom (Sunking Boom)
Luminosity – 160 lumen
Lighting Wattage – 3 Watt
Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

5. Greenlight Planet Pico Plus (Sunking Pico Plus)
Luminosity – 50 lumen
Lighting Wattage – 0.28 Watt
Lifetime of product (in years) –
Module – 15 years
Battery – 5 years
Electronics – 5 years

6. Greenlight Planet Pro 200 (Sunking Pro 200)
Luminosity – 200 lumen
Lighting Wattage – 1.25 Watt
Lifetime of product (in years) –
Module – 10 years
Battery – 5 years
Electronics – 5 years

7. Greenlight Planet Pro 300 (Sunking Pro 300)
Luminosity – 300 lumen
Lighting Wattage – 1.58 Watt
Lifetime of product (in years) –
Module – 15 years
Battery – 5 years
Electronics – 5 years

8. Greenlight Planet Pro 400 (Sunking Pro 400)
Luminosity – 400 lumen
Lighting Wattage – 5.5 Watt
Lifetime of product (in years) –

Gold Standard

Module – 15 years Battery – 8 years Electronics – 5 years

9. Greenlight Planet Pro Easy Buy (Sunking Pro Easy Buy)
Luminosity – 175 lumen
Lighting Wattage – 1.09 Watt
Lifetime of product (in years) –
Module – 15 years
Battery – 5 years
Electronics – 5 years

10. Greenlight Planet Pro 2 (Sunking Pro 2)
Luminosity – 150 lumen
Lighting Wattage – 3 Watt
Lifetime of product (in years) –
Module – 15 years
Battery – 5 years
Electronics – 5 years

11. Greenlight Planet Pro AN (Sunking Pro AN)
Luminosity – 120 lumen
Lighting Wattage – 0.80 Watt
Lifetime of product (in years) –
Module – 10 years
Battery – 5 years
Electronics – 5 years

12. Greenlight Planet Pro X (Sunking Pro X)
Luminosity – 175 lumen
Lighting Wattage – 1.093 Watt
Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

The luminosity (in Lumens) of the systems given above is as per the manufacturer's specifications. However, a cap of 140.538 Lumens is applied for the purpose of calculating emission reductions. For solar lighting system models with luminosity higher than 140.538, the cap of 140.538 Lumens is used to calculate emission reductions. For solar lighting system, models with luminosity less than the cap of 140.538 Lumens, the actual (lesser) value is used to calculate the emission reductions.

c. Relevant dates for the VPA -

- 1. Construction/Implementation date –The solar lighting systems are implemented from 01/01/2017 to 20/07/2019.
- 2. Commissioning –102,220 solar lighting systems are distributed till date under this VPA. The exact commissioning/installation dates for all the CEPs are mentioned in the Emission Reduction Calculation sheet for this VPA.
- Continued operation periods All of the functional products were continuously operational during the course of this monitoring period. Non-functional products are discounted in emission reduction calculation. Details of the Usage rates are mentioned in the Section D.2

d. Total GHG emission reductions achieved in this monitoring period for the VPA, including information on how double counting is avoided -

The total GHG emission reductions achieved in this monitoring period for the VPA is $34,320 \text{ tCO}_2\text{e}$.

e. Avoiding double counting -

Each Clean Energy Product sold under each VPA has 2 unique identifier numbers - one that is attached to each household and one that is attached to each installation within that VPA to ensure no double-counting within the PoA.

The 2 unique identification numbers for CEPs sold by each product are as follows -

Partner	Unique	Identification	Unique	identification
	number	for the	number for	the CEP
	household	S		
Midland	Customer	identification	Transaction	identification
	number		number	
Satin	Customer	identification	Transaction	identification
	number		number	
Arman	Customer	identification	Transaction	identification
	number		number	

GLP India	Customer	identification	Transaction	identification
	number		number	

Unique identification number for the households is defined as "User Account identification number" and Unique identification number for the CEPs is defined as "Loan Account number" in the emission reduction sheets.

Unique identification numbers match with the information displayed on each VPA Credit Tracker Platform, with a copy retained by the customer, thus identifying that each CEP with its unique identification number has been distributed under a PoA managed by the CME of this PoA.

At the time of including a new VPA, Micro Energy Credits ensured that the project activity is not part of CDM/GS project activity or another PoA by the following means:

- MEC signs contracts with each microfinance institution documenting that the emissions reductions in a specific project activity are included in that project and that project alone
- The partner PO explains the concept of carbon credits to the end user. The PO signs a contract with each end user recognizing the end user's title to the emissions reductions and transferring it to the PO, which then transfers it to Micro Energy Credits via the contract signed between the PO and MEC
- Micro Energy Credits and partner PO consult with participating clean energy product suppliers to clarify that credits are not included in other projects and are included only in this PoA

The MEC Credit Tracker Platform maintains data on all installations, including each CEP unique identifier number, the date of installation and the VPA/PoA with which they are associated. The platform's use of locations for each installation will ensure that each clean energy product is only included in a single VPA under a single PoA. The credit tracker platform also allocates a system generated number call "sysnum" to each installation under the PoA. No two CEP installations can have the same "sysnum".

B.1.1 Forward Action Requests >> NA

B.2. Post-Design Certification changes

>>

B.2.1. Temporary deviations from the approved Monitoring & Reporting Plan,

methodology or standardized baseline

>>

NA

B.2.2. Corrections

>>

NA

B.2.3. Changes to start date of crediting period

>>

NA

B.2.4. Permanent changes from the Design Certified monitoring plan, applied methodology or applied standardized baseline

>>

NA

B.2.5. Changes to project design of approved project

>>

NA

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

>>

Micro Energy Credit's Credit Tracker Platform is used to maintain records for each VPA. The MEC Credit Tracker Platform has been designed specifically for accelerating microfinance access to clean and efficient energy. The Credit Tracker Platform is used to collect and store the information related to the unique identification number, location, installation date, and usage status of each clean energy product (CEP) in each VPA, making it easy to identify, locate and verify all of the installations that pertain to a given VPA. The MEC Credit Tracker Platform is a hosted internet service, limiting the risk of loss of data.

<u>Monitoring system and monitoring plan of VPAs –</u> The Credit Tracker Platform enables Micro Energy Credits to maintain consistent data on all VPAs and product installations.

The process for entering data into the Credit Tracker Platform will be consistent across all VPAs. At the time of installation, the PO creates a Booking Record (in paper or

electronic format) that captures detailed data on the installation:

- Household name
- Location of household (address and/or GPS location)
- Product type installed
- Product model installed
- Date of installation
- Unique identifier number for CEP
- Respective VPA number

The Credit Tracker Platform includes a VPA Dashboard that provides a summary on the status of each VPA, and includes the fields:

- Name and unique identifier of each VPA
- List of CEPs included in each VPA
- Name of PO implementing each VPA
- Number of CEPs installed
- Aggregate emissions reductions per year for each VPA

The VPA Monitoring Record maintains monitoring and auditing data on each installation in a VPA:

- Unique identifier number for CEP
- Date of monitoring
- Usage status at time of monitoring

The monitoring activity provides a framework for project preparation and monitoring processes that have been undertaken at the VPA level for each VPA. This schedule takes into account the key parameters that are needed during the crediting periods of the project. All required monitoring and documentation have been implemented, reported, consolidated and managed by the CME. Monitored data has been stored in a suite of monitoring databases.

Summary:

1. Each PO keeps a record of all the CEPs it installs in the MEC Credit Tracker Platform. The record includes the name, date of installation, model of CEP and location of the product. All records are screened by the CME and cross-checked with the PO records to confirm the installation record is authentic and no double counting occurs.

- 2. The values of the emission reduction parameters required for ex-post ER calculation - usage rate of the water purifiers $(U_{p,y})$, usage time $(t_{p,y})$, household size $(HN_{p,y})$, volume of water consumed (QPW_p) , number of devices in the premises $(DN_{p,y})$, proportion of end users that boil safe water in the project year $(X_{cleanboil,y})$, water quality (M_q) , number of not operational SLS $(LFR_{i,v})$, average operating hours (h), average number of operational days of lamps $(d_{i,a,v})$ are found from sampling of CEP installations.
- 3. The records kept in the MEC Credit Tracker Platform relate to paper copies of title transfer agreements received from individual households.

Quality assurance

To increase the precision of the estimates during the survey, it is necessary to establish sampling mechanisms for avoiding non-sampling errors (bias) include good questionnaire design, well-tested questionnaires, possibly pilot testing the data collection. To remedy the incomplete questionnaires, additional households or schools will be drawn randomly until the required number is met at per the sample size determined. Then, well-trained personnel will scrutinize all the questionnaires. This will be a procedure to find outliers, and then outliers may be excluded and/or replaced. If the outliers are found according to the above analysis it will be omitted from the analysis if no such administrative errors exist. All monitored data such as name, date and contact information of the end-user will be archived in the electronic database tool. Hard copies of all documents will be kept at the office of CME, or an alternative place nominated by CME. All the data will be used to calculate the sample size for parameters and emission reductions. All data stored to be kept for at least two years after the crediting period or the last issuance of CERs for the project activity.

Generalities

The CME along with the PO coordinated all ex-post monitoring activities. The CME is ultimately responsible for implementing the monitoring plan, ensuring the quality of data obtained and the use of this data for emissions reduction calculations. However,

the actual field measurements to be conducted during monitoring (e.g. water consumption test or water quality test) have been performed by enumerators trained by CME and PO field staff. Sampled households were visited for 4 days to collect the data on the water consumption for drinking and other purposes. Each day enumerator or field staff would visit the household between 6-7 a.m. and filled the water purifier to its full capacity. All enumerators would carry volumetric jar to take the measurements. The data would be collected directly in the Microsoft excel.

During sampling there may be non-response from the target population. Over-sampling by 20% have been used to avoid non-response, however, sampling may cease once required confidence/precision is met.

Implementation - The survey for collecting the details of monitoring parameters was conducted annually at the end of the monitoring. The overall monitoring and the implementation of the sampling has been coordinated by the CME and the management staff. CME has ensured successful monitoring of the emission reductions of the proposed project during its crediting period. Furthermore, the survey of the representative sample for the parameters has been carried out by the distributor together with the CME. The survey method that is used by CME include: (a) Online questionnaire (b) Face to face interview (c) Telephone Interview (cross check). Primary data was stored by the implementing entities/operators.

Usage survey shall be designed in line with the requirement of Usage Survey Guidelines outlined in Annex-1 of the applied methodology.

All efforts to sample will be conducted by qualified personnel who have undergone training as part of the programme.

Technical Failure and Maintenance Protocol

POs have a robust aftersales mechanism in place which ensures customer complaints are registered and resolved in a timely manner. The mechanism involves various steps:

Step 1: Complain Registration

Step 2: Logging complaint

Gold Standard

- Step 3: Collection of products for repair
- Step 4: Resolution of the complaint

Step 5: Feedback (optional)

Customers register complaints either through field staff of the PO who visit the customer on weekly or biweekly manner or directly call the customer support number provided to them during sale of the product. Most preferred mode of complaint registration is through field staff.

POs have in house complain logging systems (manual/automatic). Intimation is sent to supplier/manufacturer local service team. As soon as the service team receives the complaint, within 48-72 hours depending on the location of the customer household, service team will visit the households for examination of the product. In case of minor issues, resolution happens on the spot. However, if the problem is major then product is collected and taken to the nearest workshop.

The service team of the supplier/manufacturer is expected to resolve the issue within 30 days of receiving the complaint. Once the product is repaired, it is returned back to the customer. In case product is beyond repair then replacement product is provided to end user by the PO.

For WPS, total repairs done were 65 for VPA 33. For SLS, 30 repairs were done for VPA 33 and 902 repairs were done for VPA 34. It can be confirmed through credit tracker output file where the data from the partner is stored. Sample tracker screenshots and sample service request forms have been submitted.

CME has put in place a system for annual and quarterly monitoring for water purifier and solar lighting systems respectively.

• Solar Lighting Systems

CME/PO have tracked the usage status of all solar lighting systems from each quarter of the year with results recorded in Credit Tracker.

At the end of each quarter of the calendar year, PO tracks and reports back to CME on whether the household is using their solar device and also whether they have purchased any other solar lighting product. This quarterly monitoring is conducted in March, June, September, and December months of every year. In cases where the end of the monitoring period does not coincide with the end month of a calendar year quarter, field staff from POs also conducts the quarterly monitoring in the same month as the end of the monitoring period.

POs conduct quarterly monitoring during the course of their regular interactions with Self-Help Groups (SHGs), which hold weekly meetings with MFI Field Officers. At the end of each quarterly monitoring period, MFI Field Officers survey clients as to the product usage status and information on presence of any other solar product.

This data is reported to MEC through and recorded in the Credit Tracker platform. Any solar lighting systems that are non-operational (due to failure or disuse by owner) are recorded as "failed" or "installed_damaged" lamps. For such solar lighting systems emission reduction are not claimed. CME doesn't remove the damaged products from the database due to two reasons:

1. Products which are damaged in one quarter or one monitoring period might get repaired or replaced, which means there is chance those might be working during subsequent monitoring.

2. Removing products from database especially where no new sales are getting added means change in the design of the programme. Therefore, CME retains the product in the database but do not claim credits for the same.

Water Purification System

In addition to methodological requirement to calculate Usage Rate (which is used to discount the ERs), as part of QA/QC defined in the PoA-DD and VPA-DD, Annual monitoring is carried out to determine the servicing requirement of all the WPS in the PoA. Based on the results of this annual monitoring survey, individual WPS status is marked as installed_active and installed_damaged. The status "installed_damaged" could reflect minor damage which does not affect the operational capability of the WPS, but to be conservative the VPA does not claim emission reductions for WPS marked "installed_damaged". The ERs are adjusted accordingly (by accounting ERs only for WPS that are "installed_active"). CME doesn't remove the damaged products from the database due to two reasons:

1. Products which are damaged in one monitoring period might get repaired or replaced which means there is chance those might be working during subsequent monitoring.

2. Removing products from database especially where no new sales are getting added means change in the design of the programme. Therefore, CME retains the product in the database but do not claim credits for the same.

SECTION D. DATA AND PARAMETERS

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

>>

For Water Purification Systems

SDG13

Parameter ID	SDWS 2
Data/parameter	Project Technology Description
Unit	N/A
Description	The following is the detailed description of the planned project technology: HWT and IWT: Manufacturer- The Eureka Forbes Limited (EFL) and Hindustan Unilever Limited (HUL) Technology type- gravity based purifier Product name- EFL Nakshatra and HUL Pureit Classic
Source of data	Manufacturer's specifications
Value(s) applied	Please refer to Section B.1
Choice of data or	-
Measurement methods	
and procedures	
Purpose of data	-

Additional comment

This parameter is fixed ex-ante & shall be updated at CP renewal.

Parameter ID	SDWS 4
Data/parameter	Regulatory Framework for safe water supply
Unit	N/A
Description	Regulatory Framework for safe water supply
Source of data	BIS Standards for Drinking Water
Value(s) applied	The VPA contributes to:
	National Water Policy (2012) ⁷
	The policy states in paragraph 1.2 (v) that access to safe water for drinking still continues to be a problem and 1.3 (vi) that safe water for drinking and sanitation should be considered as pre-emptive needs followed by other needs. In addition, the importance of community sensitization and utilization of water as per local availability of waters before providing water through long distance transfer is highlighted (paragraph 3.6.). Jal Jeevan Mission JJM (2019-2024) ⁸
	The vision of the JJM is that every household has drinking water supply in adequate quantity of prescribed quality on regular and long-term basis at affordable service delivery charges leading to improvement in living standards of rural communities. JJM further stresses the importance of awareness raising and involvement of stakeholders (paragraph 3.3 viii.) and highlight the contribution of technological interventions for removal of contaminants

 ⁷ Government of India. Ministry of Water Resources. (2012) National Water Policy. Source: http://jalshaktidowr.gov.in/policies-guideline/policies/national-water-policy
 ⁸ Government of India. Ministry of Jalshakti. Department of Drinking Water & Sanitation. (2019-2014) Jal Jeevan Mission. Source: https://jalshakti-ddws.gov.in/sites/default/files/JJM_Operational_Guidelines.pdf

	where water quality is an issue (paragraph 3.4 ii.). The VPA contributes to three core aspects mentioned in the National Water Policy (2012) and the Jal Jeevan Mission (2019-2024):
	1. Supply of rural communities with safe drinking water (point-of-use treatment)
	2. Awareness raising on WASH aspects
	3. Stakeholder participation in project activities.
	The water quality of the treated water is in line with the national drinking water standard of India: 0 CFU E.Coli/100ml (IS 10500 : 2012 ⁹)
Choice of data or	The test reports from national accredited labs confirms
Measurement methods	that the filtered water from the purifier is in compliance
and procedures	with the above values.
Purpose of data	-
Additional comment	This parameter is fixed Ex-ante & shall be updated at CP renewal.

Parameter ID	SDWS 5
Data/parameter	Water sources in the project boundary
Unit	N/A

⁹ Bureau of Indian Standards (2012) Indian Standard. Drinking Water – Specification. IS 10500 : 2012. Source: https://law.resource.org/pub/in/bis/S06/is.10500.2012.pdf

Description	The water sources in the project boundary are identified and if classified to be used for drinking water, then further classified as improved and unimproved water source.
Source of data	Baseline study /Credible published literature for project region/ Studies by academia, NGOs or multilateral institutions/ or Official government publications or statistics
Value(s) applied	Please refer to Section B.4 of the respective VPA-DD
Choice of data or	Baseline Study
Measurement methods	
and procedures	
Purpose of data	-
Additional comment	This parameter is fixed Ex-ante & shall be updated at CP renewal.

Parameter ID	SDWS 6			
Data/parameter	Stove technologies used in the project boundary			
Unit	N/A			
Description	The stove geographica stone fired c	type/technolog l area of the pro cookstoves havi	ly used in pr oject is mainly t ng an efficiency	emises in the raditional three of 10%.
Source of data	Baseline su multilateral	rvey and stuc	lies by acader	mia, NGOs, or
Value(s) applied	VPA	State	Three-stone fired	Gas Stove
	VPA33	Bihar	95%	5%
	VPA33	Punjab	93%	7%

	VPA33	Haryana	94%	6%
	VPA34	Madhya	94%	6%
		Pradesh		
Choice of data or	Baseline su	rvey and stud	lies by acade	mia, NGOs or
Measurement methods	multilateral institutions.			
and procedures				
Purpose of data	Calculation of	of baseline emis	ssions	
Additional comment	This parame	ter is fixed Ex-a	ante & shall be	updated at CP
	renewal.			

Parameter ID	SDWS 7
Data/parameter	Expected technical life of project technology
Unit	Volume or Years
Description	The expected technical life of an individual project technology is defined in section A.3 of the VPA-DD. The details include the life of different product types used.
Source of data	Manufacturer specifications
Value(s) applied	4000 litres (EFL Nakshatra) 1500 liter (HUL Pureit)
Choice of data or Measurement methods and procedures	Manufacture specification
Purpose of data	Calculation of baseline emissions
Additional comment	The technical specification of the water purification systems, provided by the manufacturer, does not specify the life span of the water purification system unit/console rather it mentions only the life span (in terms



of litres of purified water) of the Germ Kill Kit (GKK) and cartridges which is clearly specified in the VPA-DD. In cases where the life span of the water purifier technologies is shorter than the crediting period of the PoA, the project proponent shall ensure that the units are replaced in order to continue claiming emission reductions.

There shall be measures in place to ensure that end users have access to replacement purification systems of comparable quality. The technology/equipment will be replaced prior to the life span so that end users can access the same level of water purification. If no replacement or retrofitting is provided, emission reduction claims are limited to the expected technical life.

Parameter ID	SDWS 8
Data/parameter	<i>x</i> _f
Unit	Percentage of fuel f use in target population
Description	The proportion of each different cooking fuel f used in the project boundary by end-users: - % among the target population if single fuel is used for water boiling. If the project covers different types of end-user premises (e.g. households, schools), then the fuels used in the geographical area of the project by the same types of end-users are to be determined for each end-user premises type.
Source of data	Baseline survey cross checked with credible published literature for project region/studies by academia/NGOs or

	multilate or statis	eral institutions, or tics	Official governmen	t publications
Value(s) applied				
Choice of data or	VPA	State	Three-stone fired	Gas Stove
Measurement methods and procedures	VPA33	Bihar	95%	5%
	VPA33	Punjab	93%	7%
	VPA33	Haryana	94%	6%
	VPA34	Madhya Pradesh	94%	6%
Purpose of data	Calculati	on of baseline emi	issions	
Additional comment	This par renewal.	ameter is fixed Ex	k-ante & shall be u	pdated at CP

Parameter ID	SDWS 9
Data/parameter	$EF_{b,f,CO2}$
Unit	tCO ₂ /TJ
Description	CO_2 emission factor arising from use of fuels in baseline Scenario
Source of data	IPCC default CO ₂ emission factor for wood
Value(s) applied	Firewood - 112 LPG - 63.1
Choice of data or Measurement methods and procedures	Default IPCC value for fuelwood is applied
Purpose of data	Calculation of baseline emissions
Additional comment	-

Parameter ID	SDWS 10
Data/parameter	EF _{b,f,non-CO2}
Unit	tCO _{2e} /TJ
Description	Non-CO $_2$ emission factor from use of fuels, in case the baseline fuel is biomass or charcoal
Source of data	IPCC defaults for wood
Value(s) applied	Wood: 9.46
Choice of data or Measurement methods and procedures	Default IPCC value for fuelwood and charcoal is applied
Purpose of data	Calculation of baseline emissions
Additional comment	-

Parameter ID	SDWS 11
Data/parameter	ηwb
Unit	%
Description	Weighted average efficiency of the baseline water boiling devices. Calculate the weighted average of the water boiling efficiency in the project boundary using the proportion of different stove types used and the stove efficiencies.
Source of data	As per methodology Emission Reductions from Safe drinking water supply version 1.0, the following default values may be applied to calculate the weighted average of the water boiling efficiency in the project boundary:

	 Three-stone fire or a conventional system for woody biomass lacking improved combustion air supply mechanism and flue gas ventilation system, that is without either a grate or a chimney: default efficiency 10%. Other conventional systems using woody biomass: default efficiency 20%. Improved cookstoves: manufacturer specification, or if not available, default efficiency 30%. For Gas Stove (LPG based) – Literature review
Value(s) applied	Three-stone fired - 10% Gas stove – 57%
Choice of data or	Default defined in "Methodology for Emission Reductions
Measurement methods	from Safe Drinking Water Supply" v1.0 for traditional
and procedures	stove. Literature review for gas stove efficiency.
Purpose of data	Calculation of Baseline emissions
Additional comment	This parameter is fixed Ex-ante & shall be updated at CP renewal.

Parameter ID	SDWS 12		
Data/parameter	Cb		
Unit	Percentage		
Description	Proport ion of already usin source, or fr boiling	of project end-users who in the g safe water, either from an in om a water treatment method	e baseline were nproved water other than
Source of data	Baseline survey/Published literature for project region		
Value(s) applied	VPA	State	C _b
	VPA33	Bihar	5.18%

Gold Standard

	VPA33	Punjab	6.91%
	VPA33	Haryana	6.36%
	VPA34	Madhya Pradesh	5.1%
Choice of data or	Baseline St	udy and Official government	publications or
Measurement methods	statistics.		
and procedures			
Purpose of data	Calculation	of baseline emissions	
Additional comment	The safe consistent w Water source who have ad (either from treatment m under the p baseline sou criteria, by representati to credible p This parame renewal.	water sources and percent with the information reported ces in the project boundary (S ccess to a source of safe water in an improved water source, of method other than boiling) may project, unless project demons urce of water does not meet sa v conducting water quality ive period of time of 6 months published literature or other so eter is fixed Ex-ante & shall be	ages shall be for parameter SWDS 5). Users in the baseline or from a water not be credited strates that the fe water quality tests over a or by referring urces.

Parameter ID	SDWS 13
Data/parameter	q i
Unit	Litres per hour
Description	Capacity of the household or institutional water treatment technology
Source of data	Manufacturer specifications/ Design specifications
Value(s) applied	EFL Nakshatra – 10L/h HUL Pureit – 9 L/h

Gold Standard
Choice of data or Measurement methods and procedures	Manufacture specification
Purpose of data	Calculation of baseline emissions
Additional comment	This depends on water filtration device model and fixed for each model introduced. The capacity of the water treatment technology will help in calculating the amount of water treated. This parameter is fixed Ex-ante & shall be updated at CP renewal.

Parameter ID	SDWS 21
Data/parameter	f _{NRB,f,y}
Unit	Percentage
Description	Fractional non-renewability status of woody biomass fuel during year y, in case the baseline fuel is biomass or charcoal
Source of data	Assessment based on CDM Methodological tool 30: Calculation of the fraction of non-renewable biomass, Version 03.0
Value(s) applied	Kerala- 0.765 Maharashtra-0.817 Madhya Pradesh-0.842 Odisha-0.793 Assam-0.8 West Bengal-0.952 Bihar-0.97 Tamil Nadu-0.758 Uttar Pradesh-0.954

	Jharkhand-0.836
	Chhattisgarh-0.686
	Karnataka-0.675
Choice of data or	A preliminary study has been conducted in accordance
Measurement methods	with the CDM Methodological tool 30: Calculation of the
and procedures	fraction of non-renewable biomass, Version 03.0
Purpose of data	For emission reduction calculations
Additional comment	-

For Solar Lighting Systems

Data/parameter	LE _{ker}
Unit	Lumen/W
Description	The specific luminous efficiency of kerosene when burnt in a kerosene lantern
Source of data	Jean-Paul Louineau, Modibo Dicko, Peter Fraenkel, Roy Barlow and Varis Bokalders; Rural Lighting: A Guide for Development Workers, Intermediate Technology (IT) Publications in association with The Stockholm Environment Institute 1994
Value(s) applied	0.13
Choice of data or Measurement methods and procedures	Louineau et al (1994) state an efficiency range of 0.05 to 0.21 lumens/W for hurricane kerosene lanterns. Another study by the World Bank states an efficiency of 0.1 lumen/W for hurricane lanterns. Values for the widely used homemade wick lamps are scarcely available as designs vary. Anyway, these lamps have much lower efficiencies than hurricane lanterns. It is assumed that the kerosene lamp model in the baseline is a hurricane lamp. This is conservative since the vast majority of households use

	self-made kerosene lanterns without a glass cover, which
	are less efficient due to wind disturbance and very basic
	design. The average efficiency value of 0.13 lumen/watt
	for hurricane lamps from Louineau et al (1994) is chosen,
	being conservative with respect to the lower value of 0.1
	lumen/W provided by the World Bank.
Purpose of data	Calculation of baseline emissions
Additional comment	The parameter is fixed for the entire crediting period.

Data/parameter	EF _{ker}
Unit	tCO ₂ /GJ
Description	The specific CO_2 emissions of kerosene
Source of data	2006 IPCC guidelines for National Greenhouse Gas inventories
Value(s) applied	0.0719
Choice of data or	The default value of other kerosene in 2006 IPCC
Measurement methods	guidelines for National Greenhouse Gas Inventories is
and procedures	71.900 tCO2/TJ.
Purpose of data	Calculation of baseline emissions
Additional comment	The parameter is fixed for the entire crediting period.

Data/parameter	Z
Unit	n/a
Description	Standard normal for a confidence interval of 90%
Source of data	Köhler, Schachtel, Voleske, 2002; Biostatistik, Springer Verlag Berlin Heidelberg; Tafel 2, p. 279

Gold Standard

Value(s) applied	1.29
Choice of data or	The statistical standard value for standard normal for a
Measurement methods	confidence level of 90% for one-sided test which is 1.290
and procedures	as the parametric values are appropriate for a one-sided
	test.
Purpose of data	Calculation of baseline emissions
Additional comment	-

D.2 Data and parameters monitored

>>

Water Purification System SDG 13 VPA 33 GS11490

Parameter ID	SDWS 18				
Data/parameter	$M_{q,y}$				
Unit	Fraction				
Description	Ongoing samples specified water of available values f directly i in any 1 (CFU) of	water qua that pass m i in relevant the host cou e, the water o for verification ntended for o 00 ml sampl E.Coli /100	lity indicated as nicrobial quality s microbial quality intry. In case a na quality shall compl on of microbial c drinking must not e i.e., less than 1 ml	the fraction tandard requ standard for ational standa y with WHO (quality i.e., a have detectal . Colony Forn	n of the irements drinking ard is not Guideline all water ole E.Coli ning Unit
Source of data	Testing of a repres	of water at th entative sam	ne exits of the trea ple of end-users	atment techn	ology for
Value(s) applied	VPA VPA33 VPA33	Partner Midland Midland	Model- State EFL Nakshatra - Bihar HUL Pureit -	М _q 1 1	

	VPA33 Midland HUL Pureit - 1 Harvana
Measurement	Water samples are collected from selected sample
methods and	households and tested for pathogens in line with the potable
procedures	water quality norms of the host country. Table 6, page 4 of
	the Indian Standard drinking water specification (IS
	10500:2012) prescribes that any pathogens in a 100 ml
	sample means that the water is not safe for drinking.
Monitoring Frequency	Annual
QA/QC Procedures	NABL accredited laboratories were contracted to carry out
	water quality testing.
Purpose of data	Related to water quality
Additional comment	For water purifiers monitored under VPA33, this parameter
	has been calculated by accounting for the fact that if any
	water purifier is found to be "non-functional" during
	monitoring survey for "Usage" then value for " M_q " is also
	considered "0" as water sample cannot be collected from the
	household.
	For some of the water purifiers monitored, this monitoring
	parameter has been conservatively calculated by assuming
	that any water purifier with "installed_damaged" status as a
	result of the annual usage status monitoring (which is carried
	out annually for all CEPs in the PoA) is not working and that
	for these "installed damaged" products it is assumed that
	treated water is not meeting the standards for drinkable
	water quality. This has been done despite providing water
	quality reports of samples taken from the water purifiers that
	had "installed_damaged" status (with minor repairable
	issues) which show that the water quality meets the
	requirements

Parameter ID

SDWS 20

Data/parameter	Water hygiene education campaigns
Unit	-
Description	Hygiene campaigns carried out among project safe water end-users.
Source of data	Annual hygiene campaigns records
Value(s) applied	2,580 households across 12 states were selected for hygiene survey (combined survey with usage and project), were physically visited by enumerators and hygiene awareness was propagated to the households. The questionnaire used for survey had all the mandatory questions related hygiene. As per the survey, 93% households in VPA33 found to fulfill "basic" hygiene practices which means availability of a handwashing facility with soap and water at home. 81.20% of households in VPA33 found to fulfill "safely managed" requirement of drinking water which means drinking water from an improved water source that is accessible on premises, available when needed and free from fecal contamination Annual hygiene report with details have been submitted. Also, none of the households reported any increase in diarrhea or any other water borne disease during the current monitoring period.
Measurement	A questionnaire-based survey has been used to assess
procedures	experience and WHO/UNICEF JMP core questions on drinking and hygiene.
Monitoring Frequency	Annual
QA/QC Procedures	The fraction of the households where Safe water and Hygiene practices are found to fulfill "safely managed" or

	"basic" requirements is expected to increase over time as a result of the hygiene campaigns.
Purpose of data	Monitoring of SDG 6
Additional comment	-

Parameter ID	SDWS 22							
Data/parameter	$X_{cleanboil,y}$							
Unit	Percentage	Percentage						
Description	Proportion of project end-users that boil safe (treated, or from safe supply) water after installation of project technology in year y.							
Source of data	Project surv	vey						
Value(s) applied	VPA	Partner	Model- State	X _{cleanboil,y}				
	VPA33	Midland	EFL Nakshatra - Bihar	0%				
	VPA33	Midland	HUL Pureit - Punjab	0%				
	VPA33	Midland	HUL Pureit - Haryana	0%				
Measurement methods and procedures	Sampling s	urvey is carried	d out to determine th	e value				
Monitoring Frequency	Annual							
QA/QC Procedures	-							
Purpose of data	Calculation	of baseline em	nissions					
Additional comment	-							

Parameter ID	SDWS 24
Data/parameter	QPW _p
Unit	Litres/person/day

Description	Volume of drinking water per person per day for premises type p						
Source of data	- Option 2: Water Consumption Field Tests.						
	- In all cases, the value is capped at 5.5 L/person/day						
Value(s) applied	VPA	Partner	Model - State	QPW _p	7		
	VPA33	Midland	EFL Nakshatra - Bihar	4.20			
	VPA33	Midland	HUL Pureit - Punjab	4.25			
	VPA33	Midland	HUL Pureit - Haryana	4.09			
Measurement methods and procedures	The Pureit, Nakshatra model water purifier has a capacity of 23 litres,16 litres, storage respectively. At the time of surveying, the device is filled to its maximum capacity at the beginning of the day. At the end of the day, the leftover water is measured using a simple volumetric jar and the difference is taken as the water consumed per day. In case, the entire capacity of water purifier is consumed, it will be refilled for the second time to determine the actual water consumed. So, every time the filter is emptied it is again filled to its maximum capacity during the measurement day. This was done for 3 consecutive days. The average of 3 days was then divided by the total number of members in the household to get the value for the parameter. It is ensured that the survey is not done on a day when the water consumption is higher						
Monitoring Frequency	Annual						
QA/QC Procedures	The equipment used is a simple volumetric jar with least count of 100ml which does not require any calibration, nor does it have standard error values. The CME/PO conducts the survey with expert assistance. Training is provided to enumerators and testers.						
Purpose of data	Calculatio	n of baseline e	missions				
Additional comment	-						

Parameter ID	SDWS 25
Data/parameter	$HN_{p,y}$

Unit	-							
Description	Number of individuals per premises type p in the project boundary in year y							
Source of data	Project survey/Official Government Statistics							
Value(s) applied	VPA	Project Survey	Census					
	VPA33	Midland	EFL Nakshat ra - Bihar	5.30	5.5			
	VPA33	Midland	HUL Pureit - Punjab	4.60	5			
	VPA33	Midland	HUL Pureit - Haryana	4.83	5.5			
Measurement methods and procedures	Project survey							
Monitoring Frequency	Annual							
QA/QC Procedures	CME/PO conducted surveys by training the enumerators and testers.							
Purpose of data	Calculation of	f baseline em	nissions					
Additional comment	According to the applied methodology, the percentages applied shall be cross-checked against at least one other source on the list. For cross-check purposes, sources applied may be up to 5 years old. In this project the cross-check document is Census data by Government of India. CME has done comparison of project survey data and census state-wise and conservative value has been used.							

Data/parameter	$N_{p,y}$							
Unit	Number							
Description	Accumulated number of premises type p with at least one individual project technology in year y							
Source of data	Sales or dis	tribution rec	ords					
Value(s) applied	VPA	VPAPartnerModel-Np,yState						
	VPA33	Midland	EFL Nakshatra - Bihar	323				
	VPA33	Midland	HUL Pureit - Punjab	789				
	VPA33	Midland	HUL Pureit - Haryana	136				
Measurement methods and procedures	Sales database							
Monitoring Frequency	Annual							
QA/QC Procedures	 Sales or distribution records to include Date of sale/distribution Geographic area of sale Model/type of project technology sold Quantity of project technologies sold Name and telephone number, and address (if available) or other traceable indicator of premises identity and location for all end users. 							
Purpose of data	Calculation	of baseline e	emissions					
Additional comment	For water purifiers monitored under this VPA, this parameter has been conservatively calculated by assuming that if any water purifier is found to be "non-functional" during monitoring survey for "Usage" then value for number of members in the household is also considered "0". This has been done as a conservativeness measure in calculating emission reductions.							

For some of the water purifiers monitored, this monitoring parameter has been conservatively calculated by assuming that any water purifier with "installed_damaged" status as a result of the annual usage status monitoring (which is carried out annually for all CEPs in the PoA) is not working and that for these "installed_damaged" products the number of members in the household is taken as 0. This has been done despite providing monitoring results of this parameter for water purifiers with "installed_damaged" status (with minor repairable issues).

Parameter ID	SDWS 29						
Data/parameter	$U_{p,y}$						
Unit	Percenta	ige					
Description	Usage rate of the project technology by premises type p during year y						
Source of data	Project Survey of the premises using a project technology to determine the usage rate of the project technology during the year.						
Value(s) applied	VPA	Partne	Model-	Up,y			
		r	State				
	VPA3	Midland	EFL	77%			
	3		Nakshatr				
			a - Bihar				
	VPA3	Midland	HUL	80%			
	3		Pureit -				
			Punjab				
	VPA3	Midland	HUL	73%			
	3		Pureit -				
			Haryana				
Measurement	Option 1: In-person survey of project premises.						
methods and							
procedures							
Monitoring Frequency	Annual						
QA/QC Procedures	WCFT was used to cross check the usage percentage.						

Purpose of data	Calculation of baseline emissions
Additional comment	-

Parameter ID	SDWS 30
Data/parameter	$t_{p,Y}$
Unit	Hours per day
Description	Usage time of the project technology by premises type p in
	year y
Source of data	Meth default
Value(s) applied	5
Measurement methods	Option 3. Default of 5 hours
and procedures	
Monitoring Frequency	Annual
QA/QC Procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Parameter ID	SDWS 31						
Data/parameter	$DP_{p,y}$						
Unit	Days						
Description	Average days the project technology is present for end-users in the premises p in year y						
Source of data	Sales or	distributio	n records.				
Value(s) applied	VPA	Partner	Model- State	DP <i>p</i> , <i>y</i>			
	VPA33	Midland	EFL Nakshatra - Bihar	345			

	VPA33	Midland	HUL Pureit - Punjab	345			
	VPA33	Midland	HUL Pureit - Haryana	345			
Measurement methods	This is calculated as the total days from date of installation						
and procedures	of the device to the date of end of monitoring period or entire						
	monitoring period whichever is lesser						
Monitoring Frequency	Annual						
QA/QC Procedures	-						
Purpose of data	Calculation of baseline emissions						
Additional comment	-						

Parameter ID	SDWS 32
Data/parameter	$DN_{p,y}$
Unit	Number
Description	Average number of individual project technologies in each project premises type p in year y
Source of data	Sales or distribution records.
Value(s) applied	1
Measurement methods and procedures	Based on the sales or distribution records of "Quantity of project technologies sold" and identifying information of buyer/recipient, the average number of project devices per premises are calculated.
Monitoring Frequency	Annual
QA/QC Procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Solar Lighting System

VPA33: GS11490

SDG 13

Gold Standard[®]

Data / Parameter	Ln
Unit	Lumens
Description	Lumen output of each solar lamp <i>n</i> deployed as part of project activity
Source of data	Refer to table 5 section B.4 in VPA-DD
Value(s) applied	1. Sunking Boom – 140.538 (Manufacturer's specification is 160 Lumen which is more than threshold value of 140.538, hence 140.538 lumen value is considered)
	2. Sunking Pro 200 – 140.538 (Manufacturer's specification is 200 Lumen which is more than threshold value of 140.538, hence 140.538 lumen value is considered)
	3. d.light S550 – 140.538 (Manufacturer's specification is 240 Lumen which is more than threshold value of 116.9, hence 140.538 lumen value is considered)
	4 Jugnu TWP29004 – 90 (Manufacturer's specification is 90 Lumen which is less than threshold value of 140.538, hence 90 lumen value is considered)
	5. Jugnu TWP29006 – 140.538 (Manufacturer's specification is 200 Lumen which is more than threshold value of 140.538, hence 140.538 lumen value is considered)
	6. Jugnu TWP29008 – 140.538 (Manufacturer's specification is 400 Lumen which is more than threshold value of 140.538, hence 140.538 lumen value is considered)
	7. Sunking Pico – 25 (Manufacturer's specification is 25 Lumen which is less than threshold value of 140.538, hence 25 lumen value is considered)
	8. d.light D333– 140.538 (Manufacturer's specification is 520 Lumen which is more than threshold value of 140.538, hence 140.538 lumen value is considered)
	9. d.light S500 – 140.538 (Manufacturer's specification is 240 Lumen which is more than threshold value of 140.538, hence 140.538 lumen value is considered)
	10. Jugnu 2 Tubelight – 140.538 (Manufacturer's specification is 440 Lumen which is more than threshold value of 140.538, hence 140.538 lumen value is considered)

	 11. Jugnu Lightbox L1406-140.538 (Manufacturer's specification is 140 Lumen which is more than threshold value of 140.538, hence 140.538 lumen value is considered) 12.Jugnu Lightbox L2005-140.538 (Manufacturer's specification is 200 Lumen which is more than threshold value
	of 140.538, hence 140.538 lumen value is considered)
	is 250 Lumen which is more than threshold value of 140.538, hence 140.538 lumen value is considered)
	14. Sunking pro X plus-140.538 (Manufacturer's specification is 240 Lumen which is more than threshold value of 140.538, hence 140.538 lumen value is considered)
Measurement methods and procedures	Will be recorded at time of sale/installation in MEC Credit Tracker system
Monitoring frequency	Annual
QA/QC procedures	Each light installation has been geocoded (GPS coordinate or other specific location data) or provided with address/location of household in the MEC Tracker System. Associated data resides in the MEC Tracker Database, allowing each installation to be monitored on a regular basis.
Purpose of data	To calculate baseline emissions
Additional comment	The lumen value for this model is recorded once and used for emission reduction calculations. The lumen value for the lamp setting with least luminosity is used for conservativeness. In line with the information given in the eligibility criteria section in this VPA-DD, the lumen value for solar lighting systems in this VPA has been capped at 140.54 Lumen for individual households (based on Table 5 for the year 2021). If the Lumen value of solar lighting systems in an individual household is greater than 140.54 Lumen, value of 140.54 Lumen is used to calculate emission reductions. If the Lumen value of solar lighting systems in an individual household is less than 140.54 Lumen, actual (lesser) lumen value is used to calculate emission reductions.
	Additionally, each household in the database only receives one solar lighting system and if any of the households are found to have another solar lighting system installed during quarterly monitoring, then no ERs are claimed for that

household. Further, a consolidated database of sales is submitted to the verifying VVB to cross check the same.

Data / Parameter	N _{i,a}	
Unit	Lamps	
Description	Total number of solar lamps of type i that have been deployed in period a	
Source of data	Primary data collected by PO/VPA implementer and recorded in Credit Tracker	
Value(s) applied	Models	Installati
	Midland	
	d light S550(BH)	5 099
	d light S550(UP)	818
	Sunking Boom(HR)	599
	Sunking Boom(P1)	3 538
	Sunking Boom(R1)	1 723
	Sunking Pro200(HR)	151
	Sunking Pro200(R1)	4,946
	Satin	
	Jugnu TWP29004(JK)	1
	Jugnu TWP29004(OD)	6,250
	Jugnu TWP29006(BH)	348
	Jugnu TWP29006(OD)	1,682
	Jugnu TWP29006(WB)	1,514
	Jugnu TWP29008(OD)	238
	Sunking Pico(RJ)	21
	d.light D333(AS)	1,280
	d.light D333(BH)	582
	d.light D333(JK)	70
	d.light D333(MG)	62
	d.light D333(TR)	114
	d.light D333(UP)	644
	d.light S500(AS)	76
	d.light S500(UP)	35
	d.light S500(UK)	5
	d.light S550(AS)	14,614
	d.light S550(BH)	3,594
	d.light S550(MG)	424
	d.light S550(TR)	35
	d.light S550(UP)	1,250
	Jugnu 2 Tubelight(CG)	33
	Jugnu lightbox L1406(OD)	1,110
	Jugnu Lightbox L2005(BH)	2,081
	Jugnu Lightbox L2005(CG)	12
		1,449

	Sunking Boom(HR)	154
	Sunking Boom(J&K)	8
	Sunking Boom(PJ)	746
	Sunking Boom(RJ)	10,492
	Sunking Pro- 200(RJ)	28
	GLP INDIA	
	Sunking Home 40Z(BH)	352
	Sunking Home 40Z(KA)	8
	Sunking pro X plus(BH)	66,041
	Sunking pro X plus(CG)	1,237
	Sunking pro X plus(JK)	11,514
	Sunking pro X plus(MP)	1,144
	Sunking pro X plus(MH)	8,752
	Sunking pro X plus(OD)	8,998
	Sunking pro X plus(WB)	48,647
	Total	214,519
Measurement	N.A.	
methods and		
procedures		
Monitoring	Annual	
frequency		
QA/QC procedures	Each light installation is geocoded (GPS coordina	ates or other
	specific location identifiers) in the MEC Track	ker System.
	Associated data will reside in the MEC Tracke	r Database,
	allowing each installation to be monitored on a re	egular basis.
	The data in MEC tracker system can be crossched	ked with the
	MIS system of the PO.	
Purpose of data	Calculation of baseline emissions	
Additional comment	3 models for Midland, 12 models for Satin and 2 models	s for GLP are

Data / Parameter	d _{i,a,v}	
Unit	Days	
Description	Average number of days lamps of type i that deployed in period a were operating in period v	: have been
Source of data	Monitoring partner, Credit Tracker	
Value(s) applied	Models	days
	Midland	
	d.light S550(BH)	361
	d.light S550(UP)	356
	Sunking Boom(HR)	356
	Sunking Boom(PJ)	360
	Sunking Boom(RJ)	359
	Sunking Pro200(HR)	350

	Sunking Pro200(RJ)	363
	Satin	
	Jugnu TWP29004(JK)	365
	Jugnu TWP29004(OD)	361
	Jugnu TWP29006(BH)	360
	Jugnu TWP29006(OD)	357
	Jugnu TWP29006(WB)	359
	Jugnu TWP29008(OD)	344
	Sunking Pico(RJ)	365
	d.light D333(AS)	360
	d.light D333(BH)	356
	d.light D333(JK)	355
	d.light D333(MG)	347
	d.light D333(TR)	352
	d.light D333(UP)	357
	d.light S500(AS)	361
	d.light S500(UP)	346
	d.light S500(UK)	344
	d.light S550(AS)	361
	d.light S550(BH)	360
	d.light S550(MG)	357
	d.light S550(TR)	365
	d.light S550(UP)	356
	Jugnu 2 Tubelight(CG)	354
	Jugnu lightbox L1406(OD)	357
	Jugnu Lightbox L2005(BH)	358
	Jugnu Lightbox L2005(CG)	365
	Jugnu Lightbox L2005(WB)	360
	Sunking Boom(HR)	346
	Sunking Boom(J&K)	365
	Sunking Boom(PJ)	357
	Sunking Boom(RJ)	362
	Sunking Pro- 200(RJ)	365
	GLP INDIA Supking Home 407(BH)	350
	Sunking Home 402(BH)	365
	Sunking Pro X plus(BH)	364
	Sunking Pro X plus(CG)	358
	Sunking Pro X plus(1K)	361
	Sunking Pro X plus(MP)	359
	Sunking Pro X plus(MH)	362
	Sunking Pro X plus(OD)	362
	Sunking Pro X plus(WB)	363
Measurement	Exact date of sale (in the case of solar lights) and	d installation
methods and	(in the case of solar home systems) for all c	lean enerav
procedures	products is tracked by monitoring partners and	recorded in
	Credit Tracker. For products newly sold/installed	in period v,

	the date of sale or installation is used to calculate total days of operation in period v. For products sold/installed prior to period v, $d_{i,a,v}$ is be equal to the total number of days in period v.
Monitoring	Annual
frequency	
QA/QC procedures	The data in MEC tracker system can be cross checked with the MIS system of the $PO - GLP$, Midland and Satin.
Purpose of data	Calculation of baseline emissions
Additional comment	Individual number of days solar lighting systems have operated during the monitoring period is calculated and the average value is used for calculating the emission reductions.

Data / Parameter	Н
Unit	Hours/day
Description	Average operating hours of kerosene lamps in the baseline
Source of data	Methodology default
Value(s) applied	3.5
Measurement methods and procedures	N.A as default value is used.
Monitoring frequency	Annual
QA/QC procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	LFR _{i,v}	
Unit	%	
Description	Lamp failure rate: Share of lamps of lamp sample group gi,v not operational in period	type <i>i</i> in checked v
Source of data	Monitoring partner, Credit Tracker	
Value(s) applied	Models	Value, %
	Midland	
	d.light S550(BH)	1.22%
	d.light S550(UP)	2.44%
	Sunking Boom(HR)	2.50%
	Sunking Boom(PJ)	1.38%
	Sunking Boom(RJ)	1.68%
	Sunking Pro200(HR)	3.97%
	Sunking Pro200(RJ)	1.23%

Satin	
Jugnu TWP29004(JK)	0.00%
Jugnu TWP29004(OD)	1.15%
Jugnu TWP29006(BH)	2.87%
Jugnu TWP29006(OD)	2.08%
Jugnu TWP29006(WB)	1.92%
Jugnu TWP29008(OD)	5.88%
Sunking Pico(RJ)	0.000
d.light D333(AS)	1.480
d.light D333(BH)	2.580
d.light D333(JK)	2.860
d.light D333(MG)	4.840
d.light D333(TR)	3.510
d.light D333(UP)	2.170
d.light S500(AS)	1.070
d.light S500(UP)	5.260
d.light S500(UK)	5.719
d.light S550(AS)	1.079
d.light S550(BH)	1.700
d.light S550(MG)	2.120
d.light S550(TR)	0.00
d.light S550(UP)	2.400
Jugnu 2 Tubelight(CG)	3.030
Jugnu lightbox L1406(OD)	2.259
Jugnu Lightbox L2005(BH)	1.920
Jugnu Lightbox L2005(CG)	0.00
Jugnu Lightbox L2005(WB)	1.420
Sunking Boom(HR)	5.199
Sunking Boom(J&K)	0.00
Sunking Boom(PJ)	2.280
Sunking Boom(RJ)	0.810
Sunking Pro- 200(RJ)	0.00
GLP INDIA	
Sunking Home 40Z(BH)	1.420
Sunking Home 40Z(KA)	0.00
Sunking Pro X plus(BH)	0.44
Sunking Pro X plus(CG)	1.940
Sunking Pro X plus(JK)	1.010
Sunking Pro X plus(MP)	1.75
Sunking Pro X plus(MH)	0.94
Sunking Pro X plus(OD)	0.90
Sunking Pro X plus(WB)	0.50
CME/PO have tracked the usage status of all solar 1	ighting systems from e

Measurement methods and procedures

quarter of the year with results recorded in Credit Tracker.

At the end of each quarter of the calendar year, PO tracks and reports back to CME on whether the household is using their solar device and also whether

	they have purchased any other solar lighting product. This quarterly monitoring is conducted in March, June, September, and December months of every year. In cases where the end of the monitoring period does not coincide with the end month of a calendar year quarter, field staff from POs also conducts the quarterly monitoring in the same month as the end of the monitoring period.
	POs conduct quarterly monitoring during the course of their regular interactions with Self-Help Groups (SHGs), which hold weekly meetings with MFI Field Officers. At the end of each quarterly monitoring period, MFI Field Officers survey clients as to the product usage status and information on presence of any other solar product.
	This data is reported to MEC through and recorded in the Credit Tracker platform. Any solar lighting systems that are non-operational (due to failure or disuse by owner) are recorded as "failed" lamps. For such solar lighting systems emission reduction are not claimed. This data is stored in Credit Tracker and output in a report format.
Monitoring frequency	Annual
QA/QC procedures	CME/PO has tracked the usage status of all solar lighting systems from each quarter of the year with results recorded in Credit Tracker.
Purpose of data	Calculation of baseline emissions
Additional comment	Quarterly monitoring also checks if the households have any other solar product in the household. If the users report having additional solar product then no ERs are claimed for that household.

Data / Parameter	<i>CF_{i,v,LFR}</i>		
Unit	%		
Description	This factor corrects the total number of lamps of type i by the share of these lamps that were found to be operational according to the sampling in period v. The statistical error is included in the parameter (confidence level 90%) when 90/10 precision is not met. Otherwise, the mean value of LFR will be used.		
Source of data	LFR _{i,v}		
Value(s) applied			
	Models	Value %	
	Midland	97.13%	
	d.light S550(BH)	94.84%	
	d.light S550(UP)	94.75%	
	Sunking Boom(HR)	96.85%	
	Sunking Boom(PJ)	96.14%	
	Sunking Boom(RJ)	91.64%	
	Sunking Pro200(HR)	97.18%	

		Sunking Pro200(RJ)	96.88%
		Satin	
		Jugnu TWP29004(JK)	100.00%
		Juanu TWP29004(OD)	97.25%
		Juanu TWP29006(BH)	94.14%
		Jugnu TWP29006(OD)	95.73%
		Jugnu TWP29006(WB)	95.73%
			90.06%
		Supking Pico(P1)	100.00%
		d light D222(AS)	06 50%
		d.light D333(A3)	90.30%
			94.67%
			93.70%
			89.83%
		d.light D333(TR)	92.23%
		d.light D333(UP)	95.49%
		d.light S500(AS)	97.41%
		d.light S500(UP)	89.19%
		d.light S500(UK)	88.63%
		d.light S550(AS)	97.41%
		d.light S550(BH)	96.38%
		d.light S550(MG)	95.32%
		d.light S550(TR)	100.00%
		d.light S550(UP)	95.21%
		Jugnu 2 Tubelight(CG)	92.86%
		Jugnu lightbox L1406(OD)	95.14%
		Jugnu Lightbox L2005(BH)	95.96%
		Jugnu Lightbox L2005(CG)	100.00%
		Jugnu Lightbox L2005(WB)	96.82%
		Sunking Boom(HR)	90.28%
		Sunking Boom(J&K)	100.00%
		Sunking Boom(PJ)	95.13%
		Sunking Boom(RJ)	97.86%
		Sunking Pro- 200(RJ)	100.00%
		GLP INDIA	
		Sunking Home 40Z(BH)	96.38%
		Sunking Home 40Z(KA)	100.00%
		Sunking pro X plus(BH)	98.54%
		Sunking pro X plus(CG)	95.68%
		Sunking pro X plus(JK)	97.53%
		Sunking pro X plus(MP)	96.01%
		Sunking pro X plus(MH)	97.69%
		Sunking pro X plus(OD)	97./1%
		Sunking pro X plus(WB)	98.41%
Measurement methods procedures	and	The value is calculated using the reco $CF_{i,v,LFR} = 1 - (LFR_{i,v} + z * \sqrt{LR})$	proded value for LFR _{i,v} – $FRi,v * (1 - LFRi,v))$
NA 11			<i>m,v,</i> ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Monitoring frequency		Annual	

Gold Standard

QA/QC procedures	The statistical error is included in this parameter (confidence level 90%) when 90/10 precision is not met. But in this monitoring period, 90/10 precision is met.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	n, _{i,v,total}	
Unit	Lamps	
Description	Total number of lamps checked for whic obtained.	h a valid result was
Source of data	Monitoring partner, Credit Tracker	
Source of data Value(s) applied	obtained.Monitoring partner, Credit TrackerModelsMidlandd.light S550(BH)d.light S550(UP)Sunking Boom(HR)Sunking Boom(PJ)Sunking Boom(RJ)Sunking Pro200(HR)Sunking Pro200(RJ)SatinJugnu TWP29004(JK)Jugnu TWP29004(OD)Jugnu TWP29006(BH)Jugnu TWP29006(OD)Jugnu TWP29006(OD)Jugnu TWP29008(OD)Sunking Pico(RJ)d.light D333(AS)d.light D333(JK)d.light D333(TR)d.light S500(AS)d.light S500(UP)	Value 73 74 54 73 54 73 54 73 54 73 54 73 54 73 54 73 54 73 63 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 <tr< th=""></tr<>
	d.light S500(UP) d.light S500(UK) d.light S550(AS)	27 28 76
	d.light S550(BH) d.light S550(MG) d.light S550(TR)	75 53 26
	d.light S550(UP)	68
	Jugnu 2 Tubelight(CG)	29
	Jugnu Lightbox L2005(BH)	70

	Jugnu Lightbox L2005(CG)	12
	Jugnu Lightbox L2005(WB)	75
	Sunking Boom(HR)	40
	Sunking Boom(J&K)	8
	Sunking Boom(PJ)	55
	Sunking Boom(RJ)	76
	Sunking Pro- 200(RJ)	28
	GLP INDIA	
	Sunking Home 40Z(BH)	48
	Sunking Home 40Z(KA)	8
	Sunking Pro X plus(BH)	79
	Sunking Pro X plus(CG)	56
	Sunking Pro X plus(JK)	78
	Sunking Pro X plus(MP)	57
	Sunking Pro X plus(MH)	84
	Sunking Pro X plus(OD)	77
	Sunking Pro X plus(WB)	79
Measurement	The solar lighting systems are monitored based	on a survey
methods and	with sample size calculated in line with the CDM	standard for
procedures	Sampling and surveys for CDM project ac	tivities and
	programme of activities version 9.0 and g	uideline for
	Sampling and surveys for CDM project ac	tivities and
	programme of activities version 4.0. The total nur	nber of solar
	lighting systems which are found to be operation	al are noted
	down and used for this parameter.	
Monitoring	Annual	
frequency		
QA/QC procedures	CME/PO randomly and representatively tracked	households
	contacted and reached for monitoring lamp usage	ge status for
	each lamp type i in the monitoring period, p.	, This data is
	recorded in Credit Tracker. Survey methods are	used.
Purpose of data	Calculation of baseline emissions	
Additional comment	For some of the solar lighting systems distribute	d under this
	VDA this monitoring parameter has been as	
	vPA, this monitoring parameter has been co	
	Calculated by assuming that any solar lighting	system with
	installed_uamaged status as a result of the a	innual usage
	status monitoring is not working and that	for these
	"Installed_damaged" products it is assumed that	usage is 0.
	This has been done despite providing evidence	to VVB that
	the products with this status had minor repairs	that did not
	impact its functionality.	

Data / Parameter	Kerosene Usage in the Baseline
Unit	n/a

Gold	Stan	dard
------	------	------

Description	Determination of whether or not the end user used kerosene for lighting prior to the project activity
Source of data	Primary data collected by PO/CME/monitoring partner and recorded in Credit Tracker
Value(s) applied	100% (all solar lighting systems distributed under this VPA used kerosene for lighting purposes in the baseline)
Measurement methods and procedures	At the time of loan application for the solar lighting system, the household is asked about the fuel they use for lighting. A baseline document is used for this purpose that is part of the loan application form filled out by the customer while applying for a loan to buy the product. The results are recorded. Any solar lighting system with a different baseline is removed from crediting.
Monitoring frequency	Annual
QA/QC procedures	The recorded information is stored on credit tracker platform.
Purpose of data	Calculation of baseline emissions
Additional comment	The emission reduction calculation sheet accounts for this parameter by removing any solar lighting system from crediting that does not have kerosene as the baseline for lighting. All solar lighting systems distributed under this VPA used kerosene for lighting purposes in the baseline.

VPA34: GS11489

Data / Parameter	In
Unit	Lumens
Description	Lumen output of each solar lamp <i>n</i> deployed as part of project activity
Source of data	Refer to table 5 section B.4 in VPA-DD
Value(s) applied	 Sunking Boom - 140.538 (Manufacturer's specification is 160 Lumen which is more than threshold value of 140.538, hence 140.538 lumen value is considered) Sunking Pro 200 - 140.538 (Manufacturer's specification is 200 Lumen which is more than threshold value of 140.538, hence 140.538 lumen value is considered)
	 3. Sunking HLS – 140.538 (Manufacturer's specification is 400 Lumen which is more than threshold value of 140.538, hence 140.538 lumen value is considered) 4. Sunking HLS 120 – 140.538 (Manufacturer's specification is 590 Lumen which is more than threshold value of 140.538, hence 140.538 lumen value is considered)

5. Sunking Home 40Z – 140.538 (Manufacturer's specification is 250 Lumen which is more than threshold value of 140.538, hence 140.538 lumen value is considered)
6. Sunking Pico Plus – 50 (Manufacturer's specification is 50 Lumen which is less than threshold value of 140.538, hence 50 lumen value is considered)
7. Sunking Pro 300– 140.538 (Manufacturer's specification is 300 Lumen which is more than threshold value of 140.538, hence 140.538 lumen value is considered)
8. Sunking Pro 400– 140.538 (Manufacturer's specification is 400 Lumen which is more than threshold value of 140.538, hence 140.538 lumen value is considered)
9. Sunking Pro Easybuy – 140.538 (Manufacturer's specification is 175 Lumen which is more than threshold value of 140.538, hence 140.538 lumen value is considered)
10. Sunking Pro 2– 140.538 (Manufacturer's specification is 150 Lumen which is more than threshold value of 140.538, hence 140.538 lumen value is considered)
11. Sunking Pro AN-120 (Manufacturer's specification is 120 Lumen which is less than threshold value of 140.538, hence 120 lumen value is considered)
12. Sunking Pro X -140.538 (Manufacturer's specification is 175 Lumen which is more than threshold value of 140.538, hence 140.538 lumen value is considered)
Will be recorded at time of sale/installation in MEC Credit Tracker system
Annual
Each light installation has been geocoded (GPS coordinate or other specific location data) or provided with address/location of household in the MEC Tracker System. Associated data resides in the MEC Tracker Database, allowing each installation to be monitored on a regular basis.
To calculate baseline emissions
The lumen value for this model is recorded once and used for emission reduction calculations. The lumen value for the lamp

setting with least luminosity is used for conservativeness. In line with the information given in the eligibility criteria section in this VPA-DD, the lumen value for solar lighting systems in this VPA has been capped at 140.54 Lumen for individual households (based on Table 5 for the year 2021). If the Lumen value of solar lighting systems in an individual household is greater than 140.54 Lumen, value of 140.54 Lumen is used to calculate emission reductions. If the Lumen value of solar lighting systems in an individual household is less than 140.54 Lumen, actual (lesser) lumen value is used to calculate emission reductions.

Additionally, each household in the database only receives one solar lighting system and if any of the households are found to have another solar lighting system installed during quarterly monitoring, then no ERs are claimed for that household. Further, a consolidated database of sales is submitted to the verifying VVB to cross check the same.

Data / Parameter	N _{i,a}	
Unit	Lamps	
Description	Total number of solar lamps of type i that have be in period a	een deployed
Source of data	Primary data collected by PO/VPA implementer and Credit Tracker	d recorded in
Value(s) applied		Installatio
	Models	ns
	GLP INDIA	
	Sunking HLS(BH)	6
	Sunking HLS(JK)	1
	Sunking HLS(KA)	113
	Sunking HLS(TL)	3
	Sunking HLS(WB)	7
	Sunking HLS120(KA)	7
	Sunking HLS120(OD)	1
	Sunking Home 40Z(BH)	2,137
	Sunking Home 40Z(CG)	18
	Sunking Home 40Z(JK)	179
	Sunking Home 40Z(KA)	30
	Sunking Home 40Z(TL)	13
	Sunking Home 40Z(UP)	107

Sunking Boom(BH)	5,892
Sunking Boom(CG)	21
Sunking Boom(JK)	1,776
Sunking Boom(KA)	4,026
Sunking Boom(MP)	114
Sunking Boom(TN)	6,354
Sunking Boom(TL)	346
Sunking Boom(UP)	2,703
Sunking Boom(WB)	122
Sunking Pico Plus(KA)	52
Sunking Pico Plus(TL)	115
Sunking Pico Plus(UP)	422
Sunking Pico Plus(WB)	76
Sunking Pro- 200(CG)	5
Sunking Pro- 200(JK)	16
Sunking Pro- 200(KA)	2
Sunking Pro- 200(MP)	148
Sunking Pro- 200(OD)	3,544
Sunking Pro- 200(TL)	92
Sunking Pro- 200(UP)	224
Sunking Pro- 200(WB)	80
Sunking Pro 300(AS)	538
Sunking Pro 300(CG)	999
Sunking Pro 300(HR)	35
Sunking Pro 300(KA)	1,968
Sunking Pro 300(MH)	5
Sunking Pro 300(PJ)	22
Sunking Pro 300(RJ)	472
Sunking Pro 300(TL)	105
Sunking Pro 300(TR)	44
Sunking Pro 300(UP)	151
Sunking Pro 300(WB)	88
Sunking Pro 400(BH)	14,655
Sunking Pro 400(JK)	2,296
Sunking Pro 400(KA)	156
Sunking Pro 400(MP)	107
Sunking Pro 400(TL)	197
Sunking Pro 400(UP)	2,893

	Sunking Pro 400(WB)	163
	Sunking pro easybuy(KA)	2,903
	Sunking pro easybuy(TL)	110
	Sunking pro easybuy(UP)	112
	Sunking pro easybuy(WB)	111
	Sunking Pro-2(AS)	394
	Sunking Pro-2(KA)	3,591
	Sunking Pro-2(TL)	148
	Sunking Pro-2(UP)	228
	Sunking Pro-2(WB)	249
	Sunking Pro-AN(BH)	38
	Sunking Pro-AN(JK)	4
	Sunking Pro-AN(KA)	30
	Sunking Pro-AN(OD)	707
	Sunking Pro-AN(UP)	96
	Sunking Pro-AN(WB)	60
	Sunking Pro-X(BH)	9,422
	Sunking Pro-X(JK)	3,154
	Sunking Pro-X(KA)	3,108
	Sunking Pro-X(TL)	12
	Sunking Pro-X(UP)	1,048
	Sunking Pro-X(WB)	28
	Arman	
	Sunking Boom(GJ)	19,452
	Sunking Boom(MP)	224
	Sunking Boom(MH)	3,345
	Total	102,220
Measurement methods and procedures	N.A.	
Monitoring Frequency	Annual	
QA/QC procedures	Each light installation is geocoded (GPS coordinal specific location identifiers) in the MEC Track Associated data will reside in the MEC Track allowing each installation to be monitored on a r The data in MEC tracker system can be crossched MIS system of the PO.	ates or other ker System. er Database, egular basis. sked with the
Purpose of data	Calculation of baseline emissions	

Additional comment	12 models for GLP and 1 model for Arman are distributed under
	this VPA

Data / Parameter	d _{i,a,v}	
Unit	Days	
Description	Average number of days lamps of type i that deployed in period a were operating in period v	have been
Source of data	Monitoring partner, Credit Tracker	
Value(s) applied	Models	Days
	GLP INDIA	
	GLP_SunkingHLS(BH)	365
	GLP _SunkingHLS(JK)	365
	GLP_SunkingHLS(KA)	359
	GLP_SunkingHLS(TL)	365
	GLP_SunkingHLS(WB)	365
	GLP_SunkingHLS120(KA)	365
	GLP_SunkingHLS120(OD)	365
	GLP_SunkingHome40Z(BH)	358
	GLP_SunkingHome40Z(CG)	365
	GLP_SunkingHome40Z(KA)	353
	GLP_SunkingHome40Z(JK)	359
	GLP_SunkingHome40Z(TL)	365
	GLP_SunkingHome40Z(UP)	351
	GLP_SunkingBoom(BH)	357
	GLP_Sunking Boom(CG)	348
	GLP_Sunking Boom(JK)	354
	GLP_Sunking Boom(KA)	355
	GLP_Sunking Boom(MP)	349
	GLP_Sunking Boom(TN)	357
	GLP_Sunking Boom(TL)	353
	GLP_Sunking Boom(UP)	357
	GLP_Sunking Boom(WB)	353
	GLP_Sunkingpicopls(KA)	351
	GLP_Sunkingpicoplus(TL)	355
	GLP_Sunkingpicoplus(UP)	352

GLP_Sunkingpicoplus(WB)	351
GLP_SunkingPro200(CG)	365
GLP_SunkingPro200(JK)	365
GLP_SunkingPro200(KA)	365
GLP_SunkingPro200(MP)	353
GLP_SunkingPro200(OD)	359
GLP_SunkingPro200(TL)	353
GLP_SunkingPro200(UP)	355
GLP_SunkingPro200(WB)	351
GLP_SunkingPro300(AS)	355
GLP_SunkingPro300(CG)	358
GLP_SunkingPro300(HR)	355
GLP_SunkingPro300(KA)	358
GLP_SunkingPro300(MH)	365
GLP_SunkingPro300(PJ)	365
GLP_SunkingPro300(RJ)	358
GLP_SunkingPro300(TL)	355
GLP_SunkingPro300(TR)	348
GLP_SunkingPro300(UP)	350
GLP_SunkingPro300(WB)	353
GLP_SunkingPro400(BH)	361
GLP_SunkingPro400(JK)	358
GLP_SunkingPro400(KA)	353
GLP_SunkingPro400(MP)	351
GLP_SunkingPro400(TL)	354
GLP_SunkingPro400(UP)	358
GLP_SunkingPro400(WB)	356
GLP_SunkingProEasybuy (KA)	357
GLP_SunkingProEasybuy(TL)	352
GLP_SunkingProEasybuy(UP)	355
GLP_SunkingProEasybuy(WB)	355
GLP_SunkingPro2(AS)	355
GLP_SunkingPro2(KA)	358
GLP_SunkingPro2(TL)	355

	GLP_SunkingPro2(UP)	351
	GLP_SunkingPro2(WB)	355
	GLP_SunkingProAn(BH)	365
	GLP_SunkingProAN(JK)	365
	GLP_SunkingProAN(KA)	353
	GLP_SunkingProAN(OD)	356
	GLP_SunkingProAN(UP)	354
	GLP_SunkingProAN(WB	347
	GLP_SunkingProX(BH)	359
	GLP_SunkingProX(JK)	358
	GLP_SunkingProX(KA)	358
	GLP_SunkingProX(TL)	365
	GLP_SunkingProX(UP)	357
	GLP_SunkingProX(WB)	352
	Arman	
	Sunking Boom(GJ)	361
	Sunking Boom(MP)	350
	Sunking Boom(MH)	359
Measurement methods and procedures	Exact date of sale (in the case of solar lights) and (in the case of solar home systems) for all of products is tracked by monitoring partners and Credit Tracker. For products newly sold/installed the date of sale or installation is used to calculat of operation in period v. For products sold/instal period v, $d_{i,a,v}$ is be equal to the total number of da v.	d installation lean energy recorded in in period v, te total days alled prior to ays in period
Monitoring frequency	Annual	
QA/QC procedures	The data in MEC tracker system can be cross of the MIS system of the PO – GLP, Asirvad, Arohar	hecked with n, SKDRDP.
Purpose of data	Calculation of baseline emissions	
Additional comment	Individual number of days solar lighting sy operated during the monitoring period is calcula average value is used for calculating the emission	stems have ated and the n reductions.

Data / Parameter	Н
Unit	Hours/day
Description	Average operating hours of kerosene lamps in the baseline

Gold Standard

Source of data	Methodology default
Value(s) applied	3.5
Measurement methods and procedures	N.A as default value is used.
Monitoring frequency	Annual
QA/QC procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	LFR _{i,v}	
Unit	%	
Description	Lamp failure rate: Share of lamps of lamp type sample group $g_{i,v}$ not operational in period v	<i>i</i> in checked
Source of data	Monitoring partner, Credit Tracker	
Value(s) applied	Models	Value, %
	GLP INDIA	
	GLP_SunkingHLS(BH)	0.00%
	GLP _SunkingHLS(JK)	0.00%
	GLP_SunkingHLS(KA)	1.77%
	GLP_SunkingHLS(TL)	0.00%
	GLP_SunkingHLS(WB)	0.00%
	GLP_SunkingHLS120(KA)	0.00%
	GLP_SunkingHLS120(OD)	0.00%
	GLP_SunkingHome40Z(BH)	0.00%
	GLP_SunkingHome40Z(CG)	5.56%
	GLP_SunkingHome40Z(KA)	3.33%
	GLP_SunkingHome40Z(JK)	1.68%
	GLP_SunkingHome40Z(TL)	0.00%
	GLP_SunkingHome40Z(UP)	3.74%
	GLP_SunkingBoom(BH)	2.14%
	GLP_Sunking Boom(CG)	4.76%
	GLP_Sunking Boom(JK)	2.93%
	GLP_Sunking Boom(KA)	2.71%
	GLP_Sunking Boom(MP)	4.39%

GLP Sunking Boom(TN)	2.09%
GLP Sunking Boom(TL)	3.18%
GLP Sunking Boom(UP)	2.26%
GLP_Sunking Boom(WB)	3.28%
GLP_Sunkingpicopls(KA)	3.85%
GLP_Sunkingpicoplus(TL)	2.61%
GLP_Sunkingpicoplus(UP)	3.55%
GLP_Sunkingpicoplus(WB)	3.95%
GLP_SunkingPro200(CG)	0.00%
GLP_SunkingPro200(JK)	0.00%
GLP_SunkingPro200(KA)	0.00%
GLP_SunkingPro200(MP)	3.38%
GLP_SunkingPro200(OD)	1.72%
GLP_SunkingPro200(TL)	3.26%
GLP_SunkingPro200(UP)	2.68%
GLP_SunkingPro200(WB)	3.75%
GLP_SunkingPro300(AS)	2.79%
GLP_SunkingPro300(CG)	1.90%
GLP_SunkingPro300(HR)	2.86%
GLP_SunkingPro300(KA)	1.98%
GLP_SunkingPro300(MH)	0.00%
GLP_SunkingPro300(PJ)	0.00%
GLP_SunkingPro300(RJ)	1.91%
GLP_SunkingPro300(TL)	2.86%
GLP_SunkingPro300(TR)	4.55%
GLP_SunkingPro300(UP)	3.97%
GLP_SunkingPro300(WB)	3.41%
GLP_SunkingPro400(BH)	1.19%
GLP_SunkingPro400(JK)	2.05%
GLP_SunkingPro400(KA)	3.21%
GLP_SunkingPro400(MP)	3.74%
GLP_SunkingPro400(TL)	3.05%
GLP_SunkingPro400(UP)	1.80%
GLP_SunkingPro400(WB)	2.45%

		GLP_SunkingProEasybuy (KA)	2.17%
		GLP_SunkingProEasybuy(TL)	3.64%
		GLP_SunkingProEasybuy(UP)	2.68%
		GLP_SunkingProEasybuy(WB)	2.70%
		GLP_SunkingPro2(AS)	2.79%
		GLP_SunkingPro2(KA)	2.03%
		GLP_SunkingPro2(TL)	2.70%
		GLP_SunkingPro2(UP)	3.95%
		GLP_SunkingPro2(WB)	2.81%
		GLP_SunkingProAn(BH)	0.00%
		GLP_SunkingProAN(JK)	0.00%
		GLP_SunkingProAN(KA)	3.33%
		GLP_SunkingProAN(OD)	2.55%
		GLP_SunkingProAN(UP)	3.13%
		GLP_SunkingProAN(WB)	5.00%
		GLP_SunkingProX(BH)	1.75%
		GLP_SunkingProX(JK)	1.87%
		GLP_SunkingProX(KA)	1.83%
		GLP_SunkingProX(TL)	0.00%
		GLP_SunkingProX(UP)	2.10%
		GLP_SunkingProX(WB)	3.57%
		Arman	
		Sunking Boom(GJ)	1.07%
		Sunking Boom(MP)	4.02%
		Sunking Boom(MH)	1.67%
Measurement methods procedures	and	CME/PO have tracked the usage status of all s systems from each quarter of the year with resu in Credit Tracker.	solar lighting ults recorded
		At the end of each quarter of the calendar year, P reports back to CME on whether the household is solar device and also whether they have purchas solar lighting product. This quarterly monitoring in March, June, September, and December more year. In cases where the end of the monitoring not coincide with the end month of a calendar y field staff from POs also conducts the quarterly r	O tracks and s using their ed any other is conducted ths of every period does year quarter, monitoring in

the same month as the end of the monitoring period.

	POs conduct quarterly monitoring during the course of their regular interactions with Self-Help Groups (SHGs), which hold weekly meetings with MFI Field Officers. At the end of each quarterly monitoring period, MFI Field Officers survey clients as to the product usage status and information on presence of any other solar product.
	This data is reported to MEC through and recorded in the Credit Tracker platform. Any solar lighting systems that are non-operational (due to failure or disuse by owner) are recorded as "failed" lamps. For such solar lighting systems emission reduction are not claimed. This data is stored in Credit Tracker and output in a report format.
Monitoring frequency	Annual
QA/QC procedures	CME/PO has tracked the usage status of all solar lighting systems from each quarter of the year with results recorded in Credit Tracker.
Purpose of data	Calculation of baseline emissions
Additional comment	Quarterly monitoring also checks if the households have any other solar product in the household. If the users report having additional solar product then no ERs are claimed for that household.

Data / Parameter	CF _{i,v,LFR}		
Unit	%		
Description	This factor corrects the total number of lamps of type i by the share of these lamps that were found to be operational according to the sampling in period v. The statistical error is included in the parameter (confidence level 90%) when 90/10 precision is not met. Otherwise, the mean value of LFR will be used.		
Source of data	LFR _{i,v}		
Value(s) applied			
	Models	Value %	
	GLP INDIA		
	GLP_SunkingHLS(BH)	100.00%	
	GLP _SunkingHLS(JK)	100.00%	
	GLP_SunkingHLS(KA)	95.07%	
	GLP_SunkingHLS(TL)	100.00%	
GLP_SunkingHLS(WB)	100.00%		
-------------------------	---------		
GLP_SunkingHLS120(KA)	100.00%		
GLP_SunkingHLS120(OD)	100.00%		
GLP_SunkingHome40Z(BH)	95.76%		
GLP_SunkingHome40Z(CG)	100.00%		
GLP_SunkingHome40Z(KA)	92.37%		
GLP_SunkingHome40Z(JK)	95.56%		
GLP_SunkingHome40Z(TL)	100.00%		
GLP_SunkingHome40Z(UP)	91.94%		
GLP_SunkingBoom(BH)	95.83%		
GLP_Sunking Boom(CG)	89.10%		
GLP_Sunking Boom(JK)	94.29%		
GLP_Sunking Boom(KA)	94.65%		
GLP_Sunking Boom(MP)	91.02%		
GLP_Sunking Boom(TN)	95.89%		
GLP_Sunking Boom(TL)	93.24%		
GLP_Sunking Boom(UP)	95.31%		
GLP_Sunking Boom(WB)	92.78%		
GLP_Sunkingpicopls(KA)	91.55%		
GLP_Sunkingpicoplus(TL)	93.81%		
GLP_Sunkingpicoplus(UP)	92.67%		
GLP_Sunkingpicoplus(WB)	91.39%		
GLP_SunkingPro200(CG)	100.00%		
GLP_SunkingPro200(JK)	100.00%		
GLP_SunkingPro200(KA)	100.00%		
GLP_SunkingPro200(MP)	92.68%		
GLP_SunkingPro200(OD)	96.15%		
GLP_SunkingPro200(TL)	92.62%		
GLP_SunkingPro200(UP)	93.94%		
GLP_SunkingPro200(WB)	91.70%		
GLP_SunkingPro300(AS)	94.42%		
GLP_SunkingPro300(CG)	95.82%		
GLP_SunkingPro300(HR)	93.15%		
GLP_SunkingPro300(KA)	95.73%		

GLP_SunkingPro300(MH)	100.00%
GLP_SunkingPro300(PJ)	100.00%
GLP_SunkingPro300(RJ)	95.34%
GLP_SunkingPro300(TL)	93.34%
GLP_SunkingPro300(TR)	90.46%
GLP_SunkingPro300(UP)	91.77%
GLP_SunkingPro300(WB)	92.39%
GLP_SunkingPro400(BH)	97.29%
GLP_SunkingPro400(JK)	95.63%
GLP_SunkingPro400(KA)	93.01%
GLP_SunkingPro400(MP)	91.94%
GLP_SunkingPro400(TL)	92.91%
GLP_SunkingPro400(UP)	96.03%
GLP_SunkingPro400(WB)	94.22%
GLP_SunkingProEasybuy (KA)	95.44%
GLP_SunkingProEasybuy(TL)	92.16%
GLP_SunkingProEasybuy(UP)	93.70%
GLP_SunkingProEasybuy(WB)	93.66%
GLP_SunkingPro2(AS)	94.32%
GLP_SunkingPro2(KA)	95.66%
GLP_SunkingPro2(TL)	93.76%
GLP_SunkingPro2(UP)	91.98%
GLP_SunkingPro2(WB)	93.77%
GLP_SunkingProAn(BH)	100.00%
GLP_SunkingProAN(JK)	100.00%
GLP_SunkingProAN(KA)	92.44%
GLP_SunkingProAN(OD)	94.79%
GLP_SunkingProAN(UP)	92.78%
GLP_SunkingProAN(WB	89.78%
GLP_SunkingProX(BH)	96.40%
GLP_SunkingProX(JK)	95.89%
GLP_SunkingProX(KA)	95.97%
GLP_SunkingProX(TL)	100.00%
GLP_SunkingProX(UP)	95.08%

	GLP_SunkingProX(WB)	91.90%	
	Arman		
	Sunking Boom(GJ)	97.25%	
	Sunking Boom(MP)	92.36%	
	Sunking Boom(MH)	96.22%	
Measurement	The value is calculated using the recorded value	for LFR _{i,v} –	
methods and	$CF_{i,v,LFR} = 1 - (LFR_{i,v} + z * \sqrt{LFRi}, v * (1 - LFRi, v))$		
procedures	ni,v,total		
Monitoring frequency	Annual		
QA/QC procedures	The statistical error is included in this parameter level 90%) when 90/10 precision is not met. monitoring period, 90/10 precision is met.	confidence But in this	
Purpose of data	Calculation of baseline emissions		
Additional	-		
comment			

Data / Parameter	n,i,v,total		
Unit	Lamps		
Description	Total number of lamps checked for which a valid result was obtained.		
Source of data	Monitoring partner, Credit Tracker		
Value(s) applied	Models Value		
	GLP INDIA		
	GLP_SunkingHLS(BH)	6	
	GLP _SunkingHLS(JK)	1	
	GLP_SunkingHLS(KA)	29	
	GLP_SunkingHLS(TL)	3	
	GLP_SunkingHLS(WB)	7	
	GLP_SunkingHLS120(KA)	7	
	GLP_SunkingHLS120(OD)	1	
	GLP_SunkingHome40Z(BH)	62	
	GLP_SunkingHome40Z(CG)	18	
	GLP_SunkingHome40Z(KA)	29	
	GLP_SunkingHome40Z(JK)	36	
	GLP_SunkingHome40Z(TL)	13	
	GLP_SunkingHome40Z(UP)	32	

GLP_SunkingBoom(BH)	84
GLP_Sunking Boom(CG)	20
GLP_Sunking Boom(JK)	61
GLP_Sunking Boom(KA)	63
GLP_Sunking Boom(MP)	33
GLP_Sunking Boom(TN)	84
GLP_Sunking Boom(TL)	40
GLP_Sunking Boom(UP)	62
GLP_Sunking Boom(WB)	34
GLP_Sunkingpicopls(KA)	29
GLP_Sunkingpicoplus(TL)	33
GLP_Sunkingpicoplus(UP)	40
GLP_Sunkingpicoplus(WB)	29
GLP_SunkingPro200(CG)	5
GLP_SunkingPro200(JK)	16
GLP_SunkingPro200(KA)	2
GLP_SunkingPro200(MP)	35
GLP_SunkingPro200(OD)	62
GLP_SunkingPro200(TL)	31
GLP_SunkingPro200(UP)	38
GLP_SunkingPro200(WB)	29
GLP_SunkingPro300(AS)	58
GLP_SunkingPro300(CG)	60
GLP_SunkingPro300(HR)	29
GLP_SunkingPro300(KA)	62
GLP_SunkingPro300(MH)	5
GLP_SunkingPro300(PJ)	22
GLP_SunkingPro300(RJ)	41
GLP_SunkingPro300(TL)	32
GLP_SunkingPro300(TR)	29
GLP_SunkingPro300(UP)	35
GLP_SunkingPro300(WB)	31
GLP_SunkingPro400(BH)	84
GLP_SunkingPro400(JK)	62

	GLP_SunkingPro400(KA)	36
	GLP_SunkingPro400(MP)	32
	GLP_SunkingPro400(TL)	30
	GLP_SunkingPro400(UP)	62
	GLP_SunkingPro400(WB)	36
	GLP_SunkingProEasybuy (KA)	62
	GLP_SunkingProEasybuy(TL)	33
	GLP_SunkingProEasybuy(UP)	33
	GLP_SunkingProEasybuy(WB)	33
	GLP_SunkingPro2(AS)	54
	GLP_SunkingPro2(KA)	62
	GLP_SunkingPro2(TL)	35
	GLP_SunkingPro2(UP)	38
	GLP_SunkingPro2(WB)	39
	GLP_SunkingProAn(BH)	30
	GLP_SunkingProAN(JK)	4
	GLP_SunkingProAN(KA)	30
	GLP_SunkingProAN(OD)	58
	GLP_SunkingProAN(UP)	30
	GLP_SunkingProAN(WB)	29
	GLP_SunkingProX(BH)	84
	GLP_SunkingProX(JK)	61
	GLP_SunkingProX(KA)	62
	GLP_SunkingProX(TL)	12
	GLP_SunkingProX(UP)	43
	GLP_SunkingProX(WB)	28
	Arman	
	Sunking Boom(GJ)	63
	Sunking Boom(MP)	49
	Sunking Boom(MH)	62
Measurement methods and procedures	The solar lighting systems are monitored based with sample size calculated in line with the CDM Sampling and surveys for CDM project ac programme of activities version 9.0 and c	on a survey standard for ctivities and guideline for

Gold Standard

Climate Security and Sustainable Development

Sampling and surveys for CDM project activities and programme of activities version 4.0. The total number of solar

	lighting systems which are found to be operational are noted down and used for this parameter.
Monitoring frequency	Annual
QA/QC procedures	CME/PO randomly and representatively tracked households contacted and reached for monitoring lamp usage status for each lamp type i in the monitoring period, p . This data is recorded in Credit Tracker. Survey methods are used.
Purpose of data	Calculation of baseline emissions
Additional comment	For some of the solar lighting systems distributed under this VPA, this monitoring parameter has been conservatively calculated by assuming that any solar lighting system with "installed_damaged" status as a result of the annual usage status monitoring is not working and that for these "installed_damaged" products it is assumed that usage is 0. This has been done despite providing evidence to VVB that the products with this status had minor repairs that did not impact its functionality.

Data / Parameter	Kerosene Usage in the Baseline			
Unit	n/a			
Description	Determination of whether or not the end user used kerosene for lighting prior to the project activity			
Source of data	Primary data collected by PO/CME/monitoring partner and recorded in Credit Tracker			
Value(s) applied	100% (all solar lighting systems distributed under this VPA used kerosene for lighting purposes in the baseline)			
Measurement methods and procedures	At the time of loan application for the solar lighting system, the household is asked about the fuel they use for lighting. A baseline document is used for this purpose that is part of the loan application form filled out by the customer while applying for a loan to buy the product. The results are recorded. Any solar lighting system with a different baseline is removed from crediting.			
Monitoring frequency	Annual			
QA/QC procedures	The recorded information is stored on credit tracker platform.			
Purpose of data	Calculation of baseline emissions			
Additional comment	The emission reduction calculation sheet accounts for this parameter by removing any solar lighting system from crediting that does not have kerosene as the baseline for			

lighting. All solar lighting systems distributed under this VPA used kerosene for lighting purposes in the baseline.

SDG 1

Data / Parameter	BSA _{Project}			
Unit	Number			
Description	Percentage of households having access to basic services			
Source of data	Monitoring Survey Records			
Value(s) applied	VPA	Value		
	VPA33	72.08 %		
Measurement methods	Monitoring and recording of number of WPS distributed			
and procedures	under the project			
Monitoring frequency	Annually			
QA/QC procedures	-			
Purpose of data	SDG 1 contribution			
Additional comment	-			

SDG 6

Data / Parameter	Number of beneficiaries		
Unit	Number		
Description	Number of households served with safely managed water services		
Source of data	Monitoring Survey Records		
Value(s) applied	VPA Value		
	VPA 33	917	
Measurement methods	Monitoring and recording of number of WPS operational		
and procedures	under the project		

Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	SDG 6 contribution
Additional comment	-

SDG 7

Data / Parameter	ACSProject		
Unit	Number		
Description	Access to affordable and clean energy (Number of operating WPS/SLS units under Project)		
Source of data	WPS/SLS distribution records		
Value(s) applied	VPA	WPS	SLS
	VPA33	979	209,526
	VPA34	0	98261
Measurement methods	Monitor the number of WPS/SLS distributed under the		
and procedures	project as an indicator of providing reliable, clean and		
	modern technology (relative to baseline).		
Monitoring frequency	Continuous		
QA/QC procedures	-		
Purpose of data	SDG 7 contribution		
Additional comment	-		

SDG 8

Data / Parameter	QE IG _{project}
Unit	Number

Description	Quantitative Employment and income generation				
Source of data	Employment records				
Value(s) applied	VPA Number Female Male				
	VPA33	18	50		
	VPA34	5	22		
Measurement methods	Recording the number of employees (male / female) in				
and procedures	the project under	administrative, s	ales, production	n and	
	management posit	ions. Employmer	nt record with da	ate of	
	birth has been provided.				
Monitoring frequency	Annually				
QA/QC procedures	-				
Purpose of data	SDG 8 contribution				
Additional comment	-				

D.3. Comparison of monitored parameters with last monitoring period

The monitoring period for the project is 01/01/2022-31/12/2022, which is the second monitoring period under GS4GG. Hence, parameter values for previous and current monitoring period have been added below:

Data/Parameter	Value o	btained i	n this	Value	obtained	last
	monitor	ing period		monitoring period		
Ni,a	VPA	Ni,a		VPA	Ni,a	
	VPA33	214,519		33	214,519	
	VPA34	102,220		34	102,220	
	VPA	LFRi,v		VPA	LFRi,v	
	VPA33	0.90%		VPA33	0.73%	
LFRi,v	VPA34	1.79%		VPA34	1.52%	
	VPA	CFi,v,LFR]	VPA	CFi,v,LFR]
	VPA33	97.74%	1	VPA33	97.84%	1
CF _{i,v,LFR}	VPA34	96.13%	1	VPA34	96.40%	1

	VPA	ni,v,total	VPA	ni,v,total
	VPA33	Solar-	VPA33	Solar-
		2,14,519		2,14,519
		WPS-		WPS-
		1,248		1,248
	VPA34	Solar-	VPA34	Solar-
		1,02,220		1,02,220
ni,v,total		WPS-0		WPS-0
	VPA	Value	VPA	Value
	VPA33	73,617	VPA33	76,556
SDG 13	VPA34	34,320	VPA34	34,509

D.4. Implementation of sampling plan

>>

a. List of VPAs to which the single sampling was applied

Sampling plan was applied to all the following VPAs included in this issuance request: VPA-33 and VPA-34 values considered.

Description of implemented sampling design

As per Section B.7.2 of the VPA-DD and the CDM standard on "Sampling and surveys for CDM project activities and programme of activities" version 9.0, the following sampling design was implemented for the VPA –

Solar Lighting System:

The following steps were taken as part of the sampling procedure -

- 1. For VPAs with more than 1 Partner Organization (PO), the total sales population was split per partner.
- 2. For each partner organization, where sales were made in more than 1 state, the population was further split into state wise sales. This is done in order to capture the variation in solar product usage in different climatic zones.

- 3. For each state, the sales numbers were further split into solar lighting system model. Simple random sample was then applied for the proportion-based parameter "Total number of lamps checked for which a valid result was obtained" to determine the sample size. Simple random sample was adopted as the pilot data showed homogeneity regarding the usage of solar products for the PO in the VPA with solar lighting system sales. The pilot data used for determining the sample size is given in the emission reduction calculation sheet for the VPA. The sample size calculation equation was taken from Section 2.1.1, para 12, page 28 of the CDM guidelines for Sampling and surveys for CDM project activities and programmes of activities version 4.0.
- 4. The determined number of samples takes into consideration the vintage split. For e.g. if the total VPA population of solar lighting system is 300 with 60 of vintage 0-1 years, 100 of vintage 1-2 years and 140 of vintage 2-3 years, the selected samples were 6 for vintage 0-1 years, 10 for vintage 1-2 years and 14 for vintage 2-3 years for a sample size of 30.
- 5. The vintage analysis sheet is provided to the VVB including the approach for selecting samples based on vintage and a further demonstration of the vintage split reflected in the monitored samples. For e.g. table below shows the vintage split for VPA 34 Sunking Boom Maharashtra, with a total sample requirement of 66 :

Model	State	Sample	Vintage	Sales	Fraction	Samples	Fraction
		Requireme	Period	based	of Each	Monitore	of Each
		nt		on	Vintage	d for	Vintage
				correspo	in the	Each	in the
				nding	Sales	Vintage	Monitore
				vintage	Populatio		d
					n		Samples
Sunkin	Mahara	66	0-1	0	0	0	0
g	shtra		(01/01/22				
Boom			to				
			31/12/22)				
			1-2	0	0	0	0
			(01/01/21				
			to				
			31/12/21)				
			2-3	0	0	0	0

	(01/01/20				
	20 to				
	31/12/20)				
	3-4	3076	61	61	3076
	(01/01/19				
	to				
	31/12/19)				
	4-5	98	2	2	98
	(01/01/18				
	to				
	31/12/18)				
	5-6	171	3	3	171
	(01/01/17				
	to				
	31/12/17)				

Water Purification System:

As per Section B.7.2 of the VPA-DD and Safe water methodology v1.0, the following sampling design was implemented for the VPA-

The VPA is implemented in several states across the country. Population is homogenous within a state. Due to the homogeneity feature of the state, simple random sampling method was applied. A simple random sample is a subset of a population (e.g. villages, individuals, buildings, pieces of equipment) chosen randomly, such that each element (or unit) of the population has the same probability of being selected. The sample-based estimate (mean or proportion) is an unbiased estimate of the population parameter.

Usage/Project Survey

For usage survey, the minimum sample size for HWT - for individual technology age group shall be minimum 30 household. The majority of interviews in a usage survey must be conducted in person. Thus, if technologies of age 1-5 are credited, the usage

survey must include 30 representative samples from each age for total of 150 samples. The resulting usage parameter should be weighted based on the proportion of technologies in the total sales record of each age. For project survey, below mentioned guideline has been followed:

Group size	Minimum sample size
<300	30 or population size, whichever is smaller
300 to 1000	10% of group size
> 1000	100

CME has conducted common survey for usage and project taking into account both requirements.

For e.g., for VPA33 table below shows vintage spit for Sunking Boom model WPS installations in Punjab for Midland:

Vintage Year	Total Sales	Required Samples
2019	1898	47
2020	0	0
2021	0	0
2022	0	0

• Hygiene

2,580 households across 12 states were selected for hygiene survey (combined survey with usage and project), were physically visited by enumerators and hygiene awareness was propagated to the households. The questionnaire used for survey had all the mandatory questions related hygiene.

As per the survey, 93% households in VPA33 to fulfil "basic" hygiene practices which means availability of a handwashing facility with soap and water at home. 81.20% of households in VPA33 found to fulfil "safely managed" requirement of drinking water which means drinking water from an improved water source that is accessible on premises, available when needed and free from fecal contamination Annual hygiene report with details have been submitted. Also, none of the households reported any increase in diarrhoea or any other water borne disease during the current monitoring period.

• Water Quality

The sample for water quality testing has been made following the 90/10 precision rule indicated by the applied methodology.

The monitoring frequency specified in the registered monitoring plan for different technologies within these VPA is met as follows –

1. VPA33: GS1190

Parameter	Monitoring Frequency	CEPs added during this MP (01/01/2022 to 31/12/2022)	Previous monitoring dates	New Monitoring for this MP
Usage/Project Survey	Annual	No	04/01/2022 to 26/01/2022	Yes
Water testing	Annual	No	04/01/2022 to 26/02/2022	Yes
Solar Lighting System	Annual	No	02/01/2021 to 15/02/2021	Yes

Water Purification System: Monitoring field surveys/field tests for various parameters in this monitoring period was conducted from 06/01/2023 to 10/02/2023. For next monitoring period, fresh monitoring will be carried out.

Solar lighting systems: Monitoring field surveys for various parameters in this monitoring period were conducted in 02/01/2022 to 15/02/2022 for solar lighting systems. Quarterly monitoring will be ongoing to determine the Lamp Failure Rate. For the next monitoring period fresh monitoring may be carried.

2. VPA 34: GS11489

Parameter Monitor Frequer	ing CEPs acy during MP (01/01 to 31/12	added this 1/2022 /2022)	Previous monitoring dates	New Monitoring for this MP
------------------------------	---	-----------------------------------	---------------------------------	----------------------------------

Usage/Project	Annual	No	-	Yes
Survey		implementation		
		till date		
Water testing	Annual	No	-	Yes
		implementation		
		till date		
Solar Lighting	Annual	No	02/01/2021	Yes
System			to	
			20/02/2021	

Solar lighting systems: Monitoring field surveys for various parameters in this monitoring period were conducted in 02/01/2022 to 20/02/2022 for solar lighting systems. Quarterly monitoring will be ongoing to determine the Lamp Failure Rate. For the next monitoring period fresh monitoring may be carried.

The sampling approach followed, and the sample size obtained for this VPA included in this monitoring report is summarized as follows –

1. VPA33: GS11490

S.No.	Parameter	Sampling approach	Sample size	Comments
1	Total number of lamps checked for which a valid result was obtained	Simple random sampling for mean based parameter	For e.g. As per sample size calculation, sample size requirement for:	As per guidance given in para 13 and 14, page 6 and 7 of Standard for Sampling and surveys for CDM project activities and programme of activities version 8.0, 30 samples each are chosen randomly and separately from the above parameters. For
			Satin Sunking Pico (RJ) – 21 Actual monitored samples for:	some of the models like Satin Sunking Pico (RJ), the total number sales is less than 100 and hence all units (21) are sampled. Detailed sample size for all other models and calculation is provided in Emission reduction
			Satin Sunking Pico (RJ) – 21	calculation sneet.).

Solar lighting systems (Midland, Satin and GLP):

Water Purification System (Midland):

		Sampling	
S.No.	Parameter	approach	Sample size

1	Usage U _{p,y}	Simple random sampling	191 (across 1 PO and 3 states)
2	Water Quality M_q	Simple random sampling	191 (across 1 PO and 3 states)

2. VPA34: GS11489

Solar lighting systems (GLP a	and Arman)):
-------------------------------	------------	----

S.No.	Parameter	Sampling approach	Sample size	Comments
1	Total number of lamps checked for which a valid result was obtained	Simple random sampling for mean based parameter	For e.g. As per sample size calculation, sample size requirement for: GLP Sunking HLS(BH)-6 Actual monitored samples for: GLP Sunking HLS(BH)-6	As per guidance given in para 13 and 14, page 6 and 7 of Standard for Sampling and surveys for CDM project activities and programme of activities version 8.0, 30 samples each are chosen randomly and separately from the above parameters. For models like GLP Sunking HLS (BH) where the total population size is less than 30, the entire population (6) is covered. Detailed sample size for all other models and calculation is provided in Emission reduction calculation sheet.

Collected data/analysis of collected data and meeting required confidence/precision

The data collected after carrying out the monitoring surveys was further analysed to see if the required confidence/precision is met. The data collected from the surveys were compiled into the Excel spreadsheet. In order to achieve the 90/10 reliability level for simple random sampling few additional water purifiers were sampled from the database than that required to cover for non-responses, if any. The confidence/precision for solar lighting systems are met as per the CDM Standard for "Sampling and surveys for CDM project activities and programmes of activities Version 9.0" and applied methodology AMS-I.A version 14.0. The confidence/precision of 90/10 is met for all models-state and parameters for WPS as per Safe water meth v1.0.

Demonstration of whether the selected samples are representative of the population and are randomly selected The selected samples are representative of the population as they are selected using the guidance given in Safe water meth v1.0 and CDM standard on "Sampling and surveys for CDM project activities and programme of activities version 9.0" using simple random sampling approaches.

Excel based randomization tool was used to randomly select samples from a population. This tool provides randomly generated numbers when the population size to be sampled and number of samples required are inputted.

SECTION E. CALCULATION OF SDG IMPACTS

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

>>

Calculations for Water Purification System and Solar Lighting Systems SDG 13: Climate Action (WPS)

The Emission reductions are calculated as follows:

ERy = BEy - PEy - LEyWhere: ERy = Emission reductions in year y (t CO2e/yr) BEy = Baseline emissions in year y (t CO2e/yr) PEy = Project emissions in year y (t CO2e/yr) LEy = Leakage emissions in year y (t CO2e/yr)

The baseline emission shall be calculated as $BE_y = EF_b \times (1 - C_b - X_{cleanboil,y}) \times Q_y \times M_{q,y}$

Where:

BE_y	=	Baseline emissions from the use of fuel to obtain safe
		water in the baseline (tCO ₂ e)
C_b	=	Proportion of project end-users who in the baseline
		were already using a safe water supply that did not
		require boiling (%)
$X_{cleanboil,y}$	=	Proportion of project end-users that boil safe water in
		the project year y (%)

Q_y	=	Quantity of safe drinking water provided by the
		project in year y (L)
$M_{q,y}$	=	Modifier for the water quality in year y

The baseline emission factor shall be calculated as

 $EFb = SEw, b, y * \Sigma(xf * (EFb, f, CO2 * fNRB, f, y + EFb, f, nonCO2)) f \div 10^9$ Where:

EF_b	=	Emission factor for the use of fuel to obtain safe water in			
		the baseline (tCO2e/L)			
$SE_{w,b,y}$	=	Specific energy required to boil water (kJ/L), to be			
		calculated as per the paragraph below			
xf	=	Proportion of fuel f used in the baseline (fraction			
		determined based on an energy basis)			
$EF_{b,f,CO2}$	=	CO2 emission factor from use of fuel f (tCO2/TJ)			
$EF_{b,f,nonCO2}$	=	Non-CO2 emission factor arising from use of fuel f, when			
		the baseline fuel f is biomass or charcoal (tCO2e/TJ). This			
		parameter is omitted when f is a fossil fuel.			
$f_{\textit{NRB},f,y}$	=	Fractional non-renewability status of woody biomass fuel			
		during year y (fraction). For biomass, it is the fraction of			
		woody biomass that can be established as non-renewable.			
		This parameter is omitted when f is a fossil fuel.			

F = Index for baseline fuel types

The specific energy required to boil water using the baseline technology (SEw,b,y) is determined as follows, by calculating the energy input required to obtain 1 L of boiling water, including boiling and vaporization losses, taking into account default or measured stove efficiency.

 $SE_{w,b,y} = 360.83/\eta_{wb}$

Where:

360.83 = Default amount of energy required to obtain 1 L of water after 5 minutes of boiling from a first principles approach kJ/l

 η_{wb} = Efficiency of the stoves for baseline water boiling (%). Weighted average of baseline stove types.

The quantity of safe drinking water provided by the project Qy is calculated using following method (for HWT and IWT)

Gold Standard

 $Q_y = \sum N_{p,y} \times U_{p,y} \times QPW_{hh,p,y} \times DP_{p,y}$

Where:

$N_{p,y}$	=	Number of premises type p with at least one project
		technology in year y
$U_{p,y}$	=	Usage rate of the project technology by premises type
		p during year y (%)
$QPW_{hh,p,y}$	=	Volume of drinking water per premises p per day in year
		y (L)
$DP_{p,y}$	=	Days the project technology is present for end-users in
		the premises p in year y

The volume of drinking water per premises per day is determined by considering whether the capacity of the project device is sufficient to provide at least the default amount of drinking water, as follows:

 $QPW_{hh,p,y} = \min ((q_i \times t_{p,y} \times DN_{p,y}), (QPW_p \times HN_{p,y}))$ Where:

q_i	=	Capacity of the HWT or IWT individual project technology		
		(L/h)		
$t_{p,y}$	=	Usage time of the project technology by premises type p		
		in year y (h/day)		
$DN_{p,y}$	=	Average number of individual project technologies in each		
		project premises type p in year y		
$HN_{p,y}$	=	Number of individuals per premises type p (e.g.		
		household, school) in year y		
QPW_p	=	Volume of drinking water per person per day for premises		
		type p (L). Apply the default value or monitored value		
		through water consumption field tests in the project		
		scenario, capped at 5.5 L per person per day.		

The baseline estimates: -

 $BE_{y} = EF_{b} \times (1 - C_{b} - X_{cleanboil,y}) \times Q_{y} \times M_{q,y}$

VPA number	VPA33	VPA34
Total Sales	1,248	0

BEy	2273	0

13: Climate Action: Solar Lighting Systems

Applied	Equation/calculation				
methodology/approach					
13.2.2 Amount of CO ₂ e emissions reduced by the project per year	Total baseline emissions for period v are calculated as the sum of the baseline emissions of each lamp type i in the period:				
Approach: AMS.I.A., version 14.0	$=\sum_{i=1}^{n} BE_{i,v}$		v	(Eq. 2)	
	Param eter	Unit	Туре	Value	
	ΒE _v	tCO ₂	Calculate d	Emissions generated in the absence of the project activity in period v by all lamps	
	BE _{i,v}	tCO ₂	Calculate d	Emissions generated in the absence of the project activity in period v by all lamps of type <i>i</i>	
	Ex post calculate $BE_v = \Sigma$ (Eq. 3)	baseline ed with t ⁿ a=1(N _{i,a} *e	emission foi he following d _{i,a,v})*l _i * h *	r each lamp type <i>i</i> is equation: $rac{1}{LE_{ker}}$ *EF _{ker} *10 ⁻⁶ *3.6*CF _{i,v,LFR}	
	Para mete r	Unit	Туре	Value	
	BEv	tCO ₂	Calculated	Emissions generated in the absence of the project activity in period v by all lamps of type <i>i</i>	
	N _{i,a}	Numb er	Monitored	The total number of solar lamps of type <i>i</i> deployed in period <i>a</i>	
	d _{i,a,v}	Days	Monitored/ calculated	Average number of days lamps of type <i>i</i> that have been deployed in period <i>a</i> were operating in period <i>v</i>	

li	Lume n	Monitored (once per lamp type)	Nominal lumen output of solar lamps of the type <i>I</i> deployed as part of the project activity
Н	Hours /day	Fixed	Average operating hours of kerosene lamps in the baseline
LE _{ker}	Lume n/W	Fixed	The specific light output of kerosene when burnt in a kerosene lantern
EF_{ker}	tCO₂/ GJ	Fixed	The specific CO ₂ - emissions of kerosene
CF _{i,v,LF} R	-	Monitored/ Calculated	This factor corrects the total number of lamps of type <i>i</i> by the share of these lamps that were found to be operational according to the sampling in period <i>v</i> . The statistical error is included in this parameter (confidence level 90%).
Where: <i>CF_{i,v,LFR}</i>	= 1 - (L)	$FR_{i,v} + z^* \sqrt{\frac{LF}{2}}$	$\frac{R_{i,v}^*(1-LFR_{i,v})}{n_{i,v,total}} $ (Eq. 4)
Para mete r	Unit	Туре	Value
CF _{i,v,LF} R	-	Calculated	This factor corrects the total number of lamps of type <i>i</i> by the share of these lamps that were found to be operational according to the sampling in period <i>v</i> . The statistical error is included in this parameter (confidence level 90%).
LFR _{i,v}	%	Monitored	Share of lamps of lamp type <i>i</i> in checked sample group not operational in period <i>v</i> .

Z	-	Given	Standard normal for a confidence level of 90%	
N _{i,v,total}	-	Monitored	Total number of lamps checked for which a valid result was obtained.	
In line with the applied methodology and the PoA, project emissions and leakage emissions present and hence not included.				

Sample calculation for solar lighting systems for product model GLP Sunking Pro X for the state of Bihar for VPA22:

$$BE_{v} = \sum_{a=1}^{n} (N_{i,a} * d_{i,a,v}) * l_{i} * h * \frac{1}{LE_{ker}} * EF_{ker} * 10^{-6} * 3.6 * CF_{i,v,LFR}$$

VPA number	VPA33	VPA34
Total Sales	214,519	102,220
BΕ _v	73,617	34,320

The detailed calculations for baseline emissions for this VPA requesting issuance as part of this monitoring report is given in the corresponding emission reduction calculation sheets.

SDG 1: No Poverty

BSA_{Baseline} Percentage of households having access to basic services in baseline = 0

SDG 6: Clean Water and Sanitation

 $HHTS_{Baseline}$ Number of households served with safely managed water services = 0

SDG 7: Affordable and Clean Energy

ACS_{Baseline} Access to affordable and clean energy (Number of operating WPS/SLS units under Baseline) = 0

SDG 8: Decent Work and Economic Growth

QE IG_{Baseline} Quantitative Employment and income generation (Number of person (male and female) hired under Baseline) = 0

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

>>

SDG 13: Climate Action

As the project envisages implementation of solar lamp and gravity based water filter, thus eliminating the usage of kerosene and traditional stove for boiling water, project estimate/emissions are considered 0.

SDG 1: No Poverty

SDG 6: Clean Water and Sanitation

Net Benefit (SDG 6) = $N_{p,y} * (1-C_b)*U_{p,y}*M_{q,y}$ Number of households served with satisfactory level of safe water for VPA33 = 917 Number of households served with satisfactory level of safe water for VPA34 = 0

SDG 7: Affordable and Clean Energy

VPA33

ACS_{Project} Access to affordable and clean energy (Number of operating WPS units under Project) = 979 Access to affordable and clean energy (Number of operating SLS units under Project) = 209,744

VPA34

ACS_{Project} Access to affordable and clean energy (Number of operating WPS units under Project) = 0 Access to affordable and clean energy (Number of operating SLS units under Project) = 98,261

SDG 8: Decent Work and Economic Growth

QE IG_{Project} Quantitative Employment and income generation (Number of person (male and female) hired under Project) for VPA33 = 68 Quantitative Employment and income generation (Number of person (male and female) hired under Project) for VPA34 = 27

E.3. Calculation of leakage

>>

Leakage for solar in the two VPAs = 0 Leakage for water in the two VPAs = 5%

E.4. Calculation of net benefits or direct calculation for each SDG Impact

SDG	SDG Impact	Baseline	Project	Net
		estimate	estimate	benefit
	Climate Action	VPA 33-2273	VPA 33-0	VPA 33-2273
13	(WPS)	VPA 34-0	VPA 34-0	VPA 34-0
	Climate Action	VPA 33-73,617	VPA 33-0	VPA 33-73,617
13 (SLS)	VPA 34-34,320	VPA 34-0	VPA 34-34,320	
1	No poverty (WPS)	VPA 33-6.40%	VPA 33-78.48%	VPA 33-72.08%
6	Clean Water and Sanitation (WPS)	VPA 33-0	VPA33- 917	VPA33- 917
	Affordable and	VPA 33-0	VPA 33-979	VPA 33- 979
7	Clean Energy	VI/(35 0		
	(WPS)			

7	Affordable ar Clean Energ (SLS)	nd VPA 33–0 gy VPA 34–0	VPA 33-209,526 VPA 34- 98,261	VPA 33-209,526 VPA 34-98,261
8	Decent Work ar Economic Growth	VPA 33-0 nd VPA 34-0 n	VPA 33-68 VPA 34-27	VPA 33-68 VPA 34-27

E.5. Comparison of actual SDG Impacts with estimates in approved PDD

SDG	Values estimated in ex ante	Actual values ¹⁰ achieved
	calculation of approved PDD	during this monitoring period
	for this monitoring period	
12	VPA 33 - 536,209	VPA 33 - 73,617
(SLS)	VPA 34 - 536,209	VPA 34 - 34,320
10	VPA 33 - 94,015	VPA 33 – 2273
(WPS)	VPA 34 - 80,036	VPA 34 -0
13	VPA 33 – 630,224 tCO2e	VPA 33 – 75,890 tCO2e
(SLS +	VPA 34 – 616,245 tCO2e	VPA 34 – 34,320 tCO2e
WPS)		
	VPA 33 - 93.28%	VPA 33 - 72.08%
1	VPA 34 - 94.9%	VPA 34 -0
	VPA 33 - 15,069	VPA 33-917
6	VPA 34 - 24,674	VPA 34 - 0
7	VPA 33 - 16,099	VPA 33 - 979
, (WPS)	VPA 34 - 26,000	VPA 34 - 0

¹⁰ Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

7	VPA 33 - 985,808	VPA 33 – 209,526
/ (CLC)	VPA 34 - 940,888	VPA 34 -98,261
(SLS)		
	VPA 33 - 20	VPA 33 - 68
8	VPA 34 - 20	VPA 34 – 27

E.5.1. Explanation of calculation of value estimated ex ante calculation of approved PDD for this monitoring period

>>

"Amount estimated ex ante for this monitoring period in the VPA-DD (tCO2e)" is calculated from the Total emission reduction estimated for year of operation of the VPA and number of crediting days in the current monitoring period.

To achieve a comparable value of estimates for this monitoring period for VPA33 these are the factors/values considered:

Since both technologies (water purifier and solar lighting systems) are implemented in this VPA, total value of ex ante emission reduction is used for estimation. Total ex ante estimated value for year-3 (21/12/2021 to 20/12/2022) and Year-4 (21/12/2022 to 20/12/2023) of operation of VPAs from start date of crediting period is considered. Current monitoring period (01/01/2022 to 31/12/2022) falls in CP-2 Year-3 and Year-4 of the crediting period.

• The estimation of ex ante value is made for 354 days (Year 3 i.e. 01/01/2022 to 21/12/2022) and 11 days (Year 4 i.e. 20/12/2022 to 31/12/2022) totaling to 365 days (which is crediting days for this monitoring period¹¹.

To achieve a comparable value of estimates for this monitoring period for VPA34, these are the factors/values considered:

Since only solar lighting systems are implemented in this VPA, solar emission reduction value of ex ante emission reduction is used for estimation. Ex ante estimated value of solar lighting technology for Year-3 (21/12/2021 to 20/12/2022) and Year-4 (21/12/2022 to 20/12/2023) of operation of VPAs from start date of crediting period is considered. Current monitoring period (01/01/2022 to 31/12/2022) falls in CP-1 Year-3 and Year-4 of the crediting period.

The estimation of ex ante value is made for 354 days (Year 3 i.e. 01/01/2022 to 21/12/2022) and 11 days (Year 4 i.e. 20/12/2022 to 31/12/2022) totaling to 365 days (which is crediting days for this monitoring period¹².

E.6. Remarks on increase in achieved SDG Impacts from estimated value in approved PDD

>>

The SDG impact achieved for SGD 8 is more than the estimated value of 20. After the project implementation there was an increased need on the ground for energy officers for sales, marketing, end user awareness, demonstration, monitoring, after sales services etc.

SECTION F. SAFEGUARDS REPORTING

>>

Data / Parameter	Principle 6.1. Labour Rights
Unit	-
Description	Project Developer shall ensure that all employment is in compliance with national labour occupational health and safety laws and with the principles and standards embodied in the ILO fundamental conventions.
Source of data	Employment Contracts
Value(s) applied	The CME had made sure that all employment complies with regional labour laws and regulations for Midland, Satin, GLP India & Arman. The VPA does not entail any forced labour. All employees are confirmed to be minimum 18 years of age. The information is found confirmed and recorded in the monitoring report. Sample

	empl have	oyment contra been submitte	cts Midland d to VVB.	d, Sa	atin, GLP Ir	ndia 8	& Arman
Measurement methods	The	employment	contract	is	checked	to	ensure
and procedures	comp	liance with Pri	nciple 6.1				
Monitoring frequency	Annu	al					
QA/QC procedures	-						
Purpose of data	For S	afeguarding Pr	inciple 6.1				
Additional comment	-						

Data / Parameter	Principle 9.4 Release of pollutants
Unit	-
Description	Could the Project potentially result in the release of pollutants to the environment?
Source of data	PO interviews and scarp collection receipts
Value(s) applied	It was checked during monitoring through interviews of Midland, Satin, GLP India & Arman staffs, if any waste scrap disposal happened in the current monitoring. For the current monitoring period, Midland, Satin, GLP India & Arman received requests for waste scrap collection from the end users. Sample receipts have been submitted to VVB.
Measurement methods	Check the scrap disposal receipts and interview the PO
and procedures	staff to ensure compliance with Principle 9.4
Monitoring frequency	Annual
QA/QC procedures	-
Purpose of data	For Safeguarding Principle 9.4
Additional comment	-

Gold Standard[®]

SECTION G. STAKEHOLDER INPUTS AND LEGAL DISPUTES

G.1. List all Inputs and Grievances which have been received via the Continuous Input and Grievance Mechanism together with their respective responses/mitigations.

>>

The grievance mechanism is in place as per the table shown below. No negative comments that would require adjustments of the PoA/VPA were identified. Partner organization has feedback book at local offices for feedback collection. This was found to be the most effective input/grievance mechanism. However, during the current monitoring period, no grievance was received.

Method	Include all details of Chosen Method (s) so that they may be understood and, where relevant, used by readers.
Continuous Input / Grievance Expression Process Book (mandatory)	Continuous input / Grievance Expression process book is available at the office at local partner offices. By maintaining feedback book at the local office, it is ensured that stakeholders that don't have access to electronic media for expressing concerns / grievances are also able to share their concerns / feedback. Additionally, the end users always have an option to contact the partner organization (representative of MFI/ manufacturers etc.) in case of any feedback / complaints with the product post distribution.
GS Contact (mandatory)	help@goldstandard.org
Other	Email: info@satincreditcare.com, info@midlandmicrofin.com, finance@armanindia.com

G.2. Report on any stakeholder mitigations that were agreed to be monitored.

>>

There was no mitigation that was agreed to be monitored with any stakeholder during the monitoring period.

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

>>

There was no legal contest due to the project or against the project during the monitoring period. Project is in compliance with the Host Country's legal, environmental, ecological, and social regulation. Additionally, no dispute has arisen with any other party and has not reported any challenges related to the same in the current monitoring period i.e., 01/01/2022 to 31/12/2022.

Revision History

102

1.1	14 October 2020	Hyperlinked section summary to enable quick access to key
		sections
		Improved clarity on Key Project Information
		Section for POA monitoring
		Forward action request section
		Improved Clarity on SDG contribution/SDG Impact term used
		throughout
		Clarity on safeguard reporting
		Clarity on design changes
		Leakage section added for VER/CER projects
		Addition of Comparison of monitored parameters with last
		monitoring period
		Provision of an accompanying Guide to help the user
		understand detailed rules and requirements
1.0	10 July 2017	Initial adoption