

TEMPLATE

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)	GS11500, GS11499, GS11490, GS11489
Title of the project (s) covered by monitoring report	GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - CPA 22 - Clear Sky Partners – GS11500 GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - CPA 23 - Clear Sky Partners – GS11499 GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - CPA 33 - 11490 GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - CPA 34 - 11489
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	VPA22 – 3 VPA23 – 3 VPA33 – 3 VPA34 - 2
Version number of the monitoring report	3.0
Completion date of the monitoring report	11/05/2023
Date of project design certification	17/04/2023
Date of Last Annual Report	NA
Monitoring period number	1st

Duration of this monitoring period	01/01/2021 to 31/12/2021 (including both days) The monitoring period falls under crediting period CP1 for all VPAs part of the MR: VPA22: 21/06/2019 to 20/06/2024 VPA23: 21/06/2019 to 20/06/2024 VPA33: 21/12/2019 to 20/12/2024 VPA34: 21/12/2019 to 20/12/2024 The VPA has issued credits under CDM until 31/12/2020.
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 Reductions 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 Targeted	SDG Impact	Amount Achieved	Units/ Products
13 Climate Action (mandatory)	Number of VERs (SLS)	VPA22- 74,611 VPA23- 15,098 VPA33- 73,815 VPA34- 34,509	tCO ₂ e VERs
13 Climate Action (mandatory)	Number of VERs (WPS)	VPA22- 0 VPA23- 40,932 VPA33- 2,741 VPA34- 0	tCO ₂ e VERs
13 Climate Action (mandatory)	Number of VERs (SLS+WPS)	VPA22- 74,611 VPA23- 56,030	tCO₂e VERs

		VPA33- 76,556 VPA34- 34,509	
1 No Poverty	Number of WPS distributed under the project as an indicator of providing basic service access to households	VPA22- 0 VPA23- 79.45% VPA33- 74.80% VPA34- 0	Percentage
6. Clean Water and Sanitation	Number of households served with safely managed water services	VPA22- 0 VPA23- 13,105 VPA33- 948 VPA34- 0	Number
7 Affordable and Clean Energy	Number of households with operational SLS	VPA22- 213,829 VPA23- 42,791 VPA33- 209,894 VPA34- 98,538	Number
7 Affordable and Clean Energy	Number of households having operational WPS	VPA22- 0 VPA23- 13,894 VPA33- 1,013 VPA34- 0	Number
8 Decent Work and Economic Growth	Quantitative Employment and income generation	VPA22-177 VPA23-138 VPA33- 68 VPA34- 27	Number

Table 2 – Product Vintages

		Amount Achieved				
Start Dates	End Dates	VERs				
01/01/2021	31/12/2021	Tech	VPA22	VPA23	VPA33	VPA34
		SLS	74,611	15,098	73,815	34,509
		WPS	0	40,932	2,741	0
		Total	74,611	56,030	76,556	34,509

SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

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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.

Clear Sky Partners LLC (Registration number: 124415-0000416; address: 506(2), 47, Gimpohangang 9-ro, 76ben-gil, Gimpo-si, Gyeonggi-do, Republic of Korea), Byeol Gihu Bojon Yuhan Hoesa (Registration number: 110114-0240545 and address: (Cheongwon Building, 2th Floor, Yeoksam-dong) 33, Teheran-ro 8-gil, Gangnam-gu, Seoul) and other Partner organizations play the role of VPA implementers.

Clear Sky Partners LLC will provide all project costs for this VPA. Clear Sky Partners LLC will provide a subsidy to make Water purification systems (WPS) and Solar lighting systems (SLS) affordable to households. Clear Sky Partners LLC will also provide for the operation & maintenance costs of WPS and SLS and also finance the costs associated with the distribution of the WPS and SLS to the clients, to enable the VPA to operate in a financially sustainable condition.

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 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 Solar Lighting Systems are implemented by Asirvad Microfinance Limited, Greenlight Planet (GLP), Arman Microfinance, Midland Microfin Ltd., Shri Kshetra Dharamshala Rural Development Project (SKDRDP), Svasti Microfinance, Arohan Microfinance, Samasta Microfinance Ltd. (Samasta), d.light Energy Private Limited (d.light), Arohan Financial Services Pvt. Ltd. (Arohan), Arman Financial Services Limited (Arman), Evangelical Social Action Forum (ESAF). The water purification systems are implemented by Asirvad Microfinance Limited (Asirvad), Midland Microfin Ltd. (Midland), Svasti Microfinance Pvt. Ltd. (Svasti) and Samasta Microfinance Ltd. (Samasta).

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

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VPA22- GS11500

- a. Host Party (ies) - India
- b. Region/State/Province – For solar lighting systems, the States included are Andhra Pradesh (AP), Assam (AS), Bihar (BH), Chhattisgarh (CG), Goa (GOA), Gujarat (GJ), Haryana (HR), Himachal Pradesh (HP), Jharkhand (JK), Karnataka (KA), Kerala (KL), Madhya Pradesh (MP), Maharashtra (MH), Meghalaya (MG), Odisha (OD), Punjab (PJ), Rajasthan (RJ), Tamil Nadu (TN), Uttar Pradesh (UP), Uttarakhand (UK), West Bengal (WB), Puducherry (PD) and Tripura (TR) and several regions within the States.. No water purifier sales disseminated until end of this monitoring.
- 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

VPA23- GS11499

- a. Host Party (ies) - India
- b. Region/State/Province – For solar lighting systems, the States included are Assam (AS), Bihar (BH), Chhattisgarh (CG), Jharkhand (JK), Karnataka (KA), Madhya Pradesh (MP), Meghalaya (MG), Odisha (OD), Puducherry (PD), Punjab (PJ), Rajasthan (RJ), Tamil Nadu (TN), Telangana (TL), Tripura (TR), Uttar Pradesh (UP) and West Bengal (WB) and several regions within the States. For water purification systems, the States such as Bihar (BH), , Punjab (PJ), Madhya Pradesh (MP), Maharashtra (MH), Assam (AS), Chhattisgarh (CG), Jharkhand (JK), Karnataka (KA), Kerala (KL), Odisha (OD), , Tamil Nadu (TN), Uttar Pradesh (UP), West Bengal (WB) and several regions within the States.
- 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

VPA33- GS11490

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. No water filters disseminated until end of this monitoring but will be implemented in several States and regions in India, in the future.

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.

A.3. Reference of applied methodology

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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

A.4. Crediting period of project

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VPA Reference Number	Crediting Start Date	GS4GG Crediting End Date(CP1) ³	GS4GG Eligible Crediting End Date ⁴
GS11500	21/06/2019	20/06/2024	20/06/2034
GS11499	21/06/2019	20/06/2024	20/06/2034
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

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There are 4 VPAs part of this batch. VPA22 and 23 are financed by Clear Sky Partners LLC as part of the Korean ETS program.

VPA GS ID	VPA Title
GS11500	GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - CPA 22 - Clear Sky Partners – GS11500
GS11498	GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - CPA 23 - Clear Sky Partners – GS11499

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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

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Clear Sky Partners LLC will provide all project costs for VPAs 22 and 23 (VPA GS ID: GS11500, GS11499). Clear Sky Partners LLC will provide a subsidy to make Water purification system (WPS) and Solar lighting systems (SLS) affordable to households. Clear Sky Partners LLC will also provide for the operation & maintenance costs of WPS and SLS, and finance the costs associated with the distribution of the WPS and SLS and education to the clients, to enable these VPAs to operate in a financially sustainable condition.

VPA22 - GS ID: GS11500

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

Purpose: Under the VPA, Micro Energy Credits works with PO – Shri Kshetra Dharmasthala Rural Development Project (SKDRDP), Greenlight Planet India Pvt. Ltd. (GLP), Arohan Financial Services Ltd. (Arohan), Samasta Microfinance Ltd. (Samasta), Midland Microfin Ltd. (Midland), d.light Energy Private Limited (d.light), Arman Financial Services Limited (Arman), Evangelical Social Action Forum (ESAF) and Asirvad Microfinance Ltd. (Asirvad) 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.

Measures taken: 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 – 217,844

Water purification systems – No water purification systems installed till date.

Year	Water Purifiers	Solar Lighting System
2019	-	132,777
2020	-	85,067
Total	0	217,844

No further sales have been added during the current monitoring period i.e. 01/01/2021 to 31/12/2021.

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

Solar Lighting Systems

The solar lighting system model implemented under this VPA including their technical specifications is as follows:

1. CL1LT1F1HLS

Luminosity – 650 lumens

Lighting Wattage – 7 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

2. CL1LT2HLS

Luminosity – 1100 lumens

Lighting Wattage – 12 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

3. CL2HLS

Luminosity – 400 lumens

Lighting Wattage – 4 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

4. CL2LT2HLS

Luminosity – 1650 lumens

Lighting Wattage – 19 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

5. CL3LT1HLS

Luminosity – 1050 lumens

Lighting Wattage – 11 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

6. CL3LT1HLS2

Luminosity – 1050 lumens

Lighting Wattage – 11 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

7. CLT1HLS

Luminosity – 450 lumens

Lighting Wattage – 5 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

8. CLT2F1HLS

Luminosity – 1250 lumens

Lighting Wattage – 15 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

9. CLT2HLS

Luminosity – 1250 lumens

Lighting Wattage – 15 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

10. PL1LT3F1HLS

Luminosity – 1900 lumens

Lighting Wattage – 22 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

11. PL1LT3F2HLS

Luminosity – 1250 lumens

Lighting Wattage – 15 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

12. PL1LT5HLS

Luminosity – 1900 lumens

Lighting Wattage – 22 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

13. PL2LT6F1HLS

Luminosity – 4750 lumens

Lighting Wattage – 57 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

14. PL2LT8F2HLS

Luminosity – 6950 lumens

Lighting Wattage – 85 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

15. PLT3F1HLS

Luminosity – 3400 lumens

Lighting Wattage – 40 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

16. PLT4HLS

Luminosity – 1700 lumens

Lighting Wattage – 33 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

17. PLT6HLS

Luminosity – 2150 lumens

Lighting Wattage – 25 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

18. SKDLT3

Luminosity – 1350 lumens

Lighting Wattage – 15 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

19. PL1LT3F1HLS2

Luminosity – 3750 lumens

Lighting Wattage – 45 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

20. CL1LT1HLS

Luminosity – 650 lumens

Lighting Wattage – 7 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

21. PL1LT3HLS

Luminosity – 2750 lumens

Lighting Wattage – 33 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

22. d light S500

Luminosity – 240 lumens

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) –5

23. d light S100

Luminosity – 65 lumens

Lighting Wattage – 1 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

24. d.light ST100

Luminosity – 220 lumens

Lighting Wattage – 1 Watt

Average Lifetime of product (in years) –5

25. d.light D333

Luminosity – 520 lumens

Lighting Wattage – 6.6 Watt

Average Lifetime of product (in years) –5

26. d light S550

Luminosity – 240 lumens

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) –5

27. Greenlight Planet Home Lighting System (Sunking HLS)

Luminosity – 400 lumens

Lighting Wattage – 2.64Watt

Average Lifetime of product (in years) –5

28. Greenlight Planet Pro-400 (Sunking Pro -400)

Luminosity – 400 lumens

Lighting Wattage – 5.5 Watt

Average Lifetime of product (in years) –5

29. Greenlight Planet Boom (Sunking Boom)

Luminosity – 160 lumens

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) –5

30. Greenlight Planet Torch (Sunking torch)

Luminosity – 300 lumens

Lighting Wattage – 1.8 Watt

Average Lifetime of product (in years) –5

31. Greenlight Planet Pro-200 (Sunking Pro 200)

Luminosity – 200 lumens

Lighting Wattage – 1.25 Watt

Average Lifetime of product (in years) –5

32. Greenlight Planet Pro X Plus (Sunking Pro X Plus)

Luminosity – 240 lumens

Lighting Wattage –1.5 Watt

Average Lifetime of product (in years) –5

33. Greenlight Planet Pico Plus (Sunking Pico Plus)

Luminosity – 50 lumens

Lighting Wattage –0.28 Watt

Average Lifetime of product (in years) –5

34. RAL Duron Mitva MS-16C

Luminosity – 80 lumens

Lighting Wattage – 0.8 Watt

Average Lifetime of product (in years) –5

35. Glosolar Mini HLS

Luminosity – 160 lumens

Lighting Wattage –1.25 Watt

Average Lifetime of product (in years) –5

36. Jugnu 2 Tubelight

Luminosity – 440 lumens

Lighting Wattage – 4 Watt

Average Lifetime of product (in years) –5

37. Jugnu Lightbox L2005

Luminosity – 200 lumens

Lighting Wattage –1.8 Watt

Average Lifetime of product (in years) –5

38. RAL Duron Mitva MST 952A

Luminosity – 400 lumens

Lighting Wattage – 2 Watt

Average Lifetime of product (in years) –5

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 under this VPA are implemented from 21/06/2019 to 31/12/2020.
2. Commissioning – 217,844 solar lighting systems are distributed until 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.
3. 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 74,611 tCO₂e.

VPA23 - GS ID: GS11499

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

Purpose: Under the VPA, Micro Energy Credits works with PO – Arohan Financial Services Pvt. Ltd. (Arohan), Greenlight Planet India Pvt. Ltd. (GLP), Midland Microfin Ltd. (Midland), Svasti Microfinance Pvt. Ltd. (Svasti), Asirvad Microfinance Ltd. (Asirvad), Samasta Microfinance Ltd. (Samasta) and Shri Kshetra Dharmasthala Rural Development Project (SKDRDP) 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.

Measures taken: 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 – 44,023

Water purification systems –16,318⁵

Year	Water Purifiers	Solar Lighting System
2019	9,746	13,419
2020	6,572	30,604
Total	16,318	44,023

No further sales have been added during the current monitoring period i.e. 01/01/2021 to 31/12/2021.

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

Water Purifier:

The Water Purifier model implemented under this and their technical specifications are as follows –

a. PureIt Classic (HUL-PureIt)

Size: 61 cm X 29 cm X 21 cm

Net weight: 4.1 kg

Flow rate: 10l/h

Warranty: 2 years

Life span under standard use conditions: The Germ kill kit (GKK) however has to be replaced after every 1500 l as required by the manufacturer's specifications⁶.

PureIt Classic meet the international criteria for microbiologically safe drinking water as per the Environmental Protection Agency (EPA), USA and National Standards.

b. Aquasure Nakshatra (EFL-Nakshatra)

Size: 51 cm X 26 cm X 26 cm

Net weight: 2.38 kg

Flow rate: 9l/h

Warranty: 2 years

Life span under standard use conditions: The cartridges however have to be replaced after every 4000 l as required by the manufacturer's specifications⁷.

Aquasure Nakshatra meet the international criteria for microbiologically safe drinking water as per the Environmental Protection Agency (EPA), USA and National Standards.

c. EFL Asha

Size: 67 cm X 24 cm X 24 cm

Net Weight: 4 kg

Gold Standard

Flow rate: 10l/h

Warranty: 2 years

Life span under standard use conditions: The cartridges however have to be replaced after every 4000 l as required by the manufacturer's specifications⁸.

Aquasure Asha meet the international criteria for microbiologically safe drinking water as per the Environmental Protection Agency (EPA), USA and National Standards.

d. EFL Sampoorina

Size: 27cm X 50cm X 38cm

Net Weight: 4 kg

Flow rate: 10l/h

Warranty: 2 years

Life span under standard use conditions: The cartridges however have to be replaced after every 4000 l as required by the manufacturer's specifications⁹.

Aquasure Sampoorina meet the international criteria for microbiologically safe drinking water as per the Environmental Protection Agency (EPA), USA and National Standards.

Solar Lighting Systems

The solar lighting system model implemented under this VPA including their technical specifications is as follows:

1. d.light S100

Luminosity – 65 lumens

Lighting Wattage – 1 Watt

Average Lifetime–5years

2. d.light S450

Luminosity- 170 lumens

Light Wattage: 3 Watt

Gold Standard

Average Lifetime –5years

3. d light S500

Luminosity – 240 lumens

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) –5

4. d light ST100

Luminosity – 220 lumens

Lighting Wattage – 1 Watt

Average Lifetime of product (in years) –5

5. Greenlight Planet Boom (Sunking Boom)

Luminosity – 160 lumens

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) –5

6. Greenlight Planet Home Lighting System (Sunking HLS)

Luminosity – 400 lumens

Lighting Wattage – 2.64 Watt

Average Lifetime of product (in years) –5

7. Greenlight Planet Home 250 (Sunking Home 250)

Luminosity – 400 lumens

Lighting Wattage – 8 Watt

Average Lifetime of product (in years) –5

8. Greenlight Planet Home 40z (Sunking Home 40Z)

Luminosity –250 lumens

Lighting Wattage – 1.68 Watt

Average Lifetime of product (in years) –5

9. Greenlight Planet Pico Plus (Sunking Pico Plus)

Luminosity – 50 lumens

Lighting Wattage – 0.28 Watt

Average Lifetime of product (in years) –5

10. Greenlight Planet Pro 200 (Sunking Pro 200)

Luminosity – 200 lumens

Lighting Wattage – 1.25 Watt

Average Lifetime of product (in years) –5

11. Greenlight Planet Pro 300 (Sunking Pro 300)

Luminosity – 300 lumens

Lighting Wattage – 1.58 Watt

Average Lifetime of product (in years) –5

12. Greenlight Planet Pro 400 (Sunking Pro 400)

Luminosity – 400 lumens

Lighting Wattage – 5.5 Watt

Average Lifetime of product (in years) –5

13. Greenlight Planet Pro Easybuy (Sunking Pro Easybuy)

Luminosity – 175 lumens

Lighting Wattage – 1.09 Watt

Average Lifetime of product (in years) –5

14. Greenlight Planet Pro 2 (Sunking Pro-2)

Luminosity – 150 lumens

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) –5

15. Greenlight Planet Pro X (Sunking Pro-X)

Luminosity – 175 lumens

Lighting Wattage – 1.093 Watt

Average Lifetime of product (in years) –5

16. Greenlight Planet Torch (Sunking Torch)

Luminosity – 300 lumens

Lighting Wattage – 1.8 Watt

Average Lifetime of product (in years) –5

17. Greenlight Planet Home Lighting System 120 (Sunking HLS 120)

Luminosity – 590 lumens

Lighting Wattage – 5.28 Watt

Average Lifetime of product (in years) –5

18. Jugnu LightBox 2005

Luminosity – 200 lumens

Lighting Wattage – 1.8 Watt

Average Lifetime of product (in years) –minimum 5 years

19. Glosolar mini HLS

Luminosity – 400 lumens

Lighting Wattage – 2.5 Watt

Average Lifetime of product (in years) –5

20. CL1LT1F1HLS

Luminosity – 650 lumens

Lighting Wattage – 7 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

21. CL1LT2HLS

Luminosity – 1100 lumens

Lighting Wattage – 12 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

22. CL2HLS

Luminosity – 400 lumens

Lighting Wattage – 4 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

23. CL2LT2HLS

Luminosity – 1650 lumens

Lighting Wattage – 19 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

24. CL3LT1HLS2

Luminosity – 1050 lumens

Lighting Wattage – 11 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

25. CLT1HLS

Luminosity – 450 lumens

Lighting Wattage – 5 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

26. CLT2F1HLS

Luminosity – 1250 lumens

Lighting Wattage – 15 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

27. CLT2HLS

Luminosity – 1250 lumens

Lighting Wattage – 15 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

28. PL1LT3F2HLS

Luminosity – 1250 lumens

Lighting Wattage – 15 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

29. PL1LT5HLS

Luminosity – 1900 lumens

Lighting Wattage – 22 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

30. PL2LT6F1HLS

Luminosity – 4750 lumens

Lighting Wattage – 57 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

31. PL2LT8F2HLS

Luminosity – 6950 lumens

Lighting Wattage – 85 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

32. PLT3F1HLS

Luminosity – 3400 lumens

Lighting Wattage – 40 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

33. PL1LT3F1HLS2

Luminosity – 3750 lumens

Lighting Wattage – 45 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

34. CL1LT1HLS

Luminosity – 650 lumens

Lighting Wattage – 7 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

35. PL1LT4HLS

Luminosity – 2350 lumens

Lighting Wattage – 27 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

36. CL2LT2HLS2

Luminosity – 1650 lumens

Lighting Wattage – 19 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

37. PL2LT4HLS

Luminosity – 2550 lumens

Lighting Wattage – 29 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

38. PLT4F1HLS

Luminosity – 2150 lumens

Lighting Wattage – 25 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

39. Greenlight Tubelight (Sunking Tubelight)

Luminosity – 400 lumens

Lighting Wattage – 2.6 Watt

Average 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 under this VPA are implemented from 21/06/2019 to 31/12/2020. The water purifiers under this VPA are implemented from 22/07/2019 to 30/12/2020.
2. Commissioning – 44,023 solar lighting systems are distributed till date under this VPA. 16,318 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.
3. 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 56,030 tCO₂e.

VPA33 - GS ID: GS11490

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

Purpose: 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.

Measures taken: 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
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No further sales have been added during the current monitoring period i.e. 01/01/2021 to 31/12/2021.

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: 9l/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 l after which it must be replaced. This product comes with one additional cartridge of 4000 l capacity. The life of the kit therefore depends on how much water is purified by the user every day¹⁰.

- HUL Pureit classic

The technical specifications¹¹ 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 l after which it must be replaced. The life of the kit therefore depends on how much water is purified by the user every day¹².

Gold Standard_____

Solar Lighting System

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

1. 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

2. 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

5. 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

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

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.
2. 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.
3. 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 76,556 tCO₂e.

VPA34 - GS ID: GS11489

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

Purpose: 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.

Measures taken: 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 – 102,220

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. 01/01/2021 to 31/12/2021.

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 -

1. 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) –

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.
3. 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 34,509 tCO₂e.

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 number for the households	Unique identification number for the CEP
SKDRDP	Group Identification number-Member ID	Branch ID-Loan account number
d.light	Customer identification number	Loan Proposal Identification Number
ESAF	User account number	Branch ID- Loan account number
Arohan	Customer identification number	Loan identification number
GLP	Customer identification number	Transaction identification number
Midland	Customer identification number	Transaction identification number
Svasti	User Identification number	Transaction identification number
Asirvad	User Identification number	Transaction identification number
Arman	Customer identification number	Transaction identification number
Satin	Customer identification number	Transaction identification number
Muthoot	Customer identification number	Transaction identification 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

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NA

B.2. Post-Design Certification changes

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B.2.1. Temporary deviations from the approved Monitoring & Reporting Plan, methodology or standardized baseline

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NA

B.2.2. Corrections

>>

NA

B.2.3. Changes to start date of crediting period

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NA

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

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NA

B.2.5. Changes to project design of approved project

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NA

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

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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.

Monitoring system and monitoring plan of VPAs – 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 has 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 examined further to correct for possible transcription and data entry errors, but 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) has 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 be 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 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 of sampling 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

Step 3: Collection of product for repair

Step 4: Resolution of the complaint

Step 5: Feedback (optional)

Customers register complaint 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 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.

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. Sample service request forms have been submitted.

For WPS, total repairs done were for 2448 and 187 for VPA 23 and VPA 33 respectively. For SLS, 32,677 repairs were done for VPA 22, 6,603 repairs were done for VPA 23, 21,452 repairs were done for VPA 33 and 15,333 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 donot 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

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SDG 13

Water Purification System

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- Aquasure Nakshatra (EFL Nakshatra), Aquasure Sampoorna (Sampoorna), Aquasure Asha (EFL Asha) 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)

	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) 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 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)
Choice of data or Measurement methods and procedures	The test reports from national accredited labs confirms that the filtered water from the purifier is in compliance 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

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	Refer to Section B.4 of the respective VPA-DD
Choice of data or Measurement methods and procedures	Baseline Study
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 type/technology used in premises in the geographical area of the project is mainly traditional three stone fired cookstoves having an efficiency of 10%.			
Source of data	Baseline survey and studies by academia, NGOs or multilateral institutions			
Value(s) applied	VPA	State	Three-stone fired	Gas Stove
	VPA22	Bihar	95%	5%
	VPA22	Tamil Nadu	97%	3%
	VPA22	Jharkhand	98%	2%
	VPA23	Assam	92%	8%
	VPA23	Bihar	98%	2%
	VPA23	Chhattisgarh	94%	6%
	VPA23	Jharkhand	95%	6%
	VPA23	Karnataka	92%	8%
	VPA23	Kerala	95%	5%
	VPA23	Maharashtra	96%	4%
	VPA23	Madhya Pradesh	91%	9%
	VPA23	Odisha	92%	8%
	VPA23	Tamil Nadu	90%	10%
	VPA23	Uttar Pradesh	94%	6%
	VPA23	West Bengal	92%	8%
VPA33	Bihar	95%	5%	

	VPA33	Punjab	93%	7%
	VPA33	Haryana	94%	6%
	VPA34	Madhya Pradesh	94%	6%
Choice of data or Measurement methods and procedures	Baseline survey and studies by academia, NGOs or multilateral institutions.			
Purpose of data	Calculation of baseline emissions			
Additional comment	This parameter is fixed Ex-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, EFL Asha and EFL Sampoorna) 1500 litre (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	x_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 multilateral institutions, or Official government publications or statistics																																																																																		
Value(s) applied	<table border="1"> <thead> <tr> <th>VPA</th><th>State</th><th>Three-stone fired</th><th>Gas Stove</th></tr> </thead> <tbody> <tr><td>VPA22</td><td>Bihar</td><td>95%</td><td>5%</td></tr> <tr><td>VPA22</td><td>Tamil Nadu</td><td>97%</td><td>3%</td></tr> <tr><td>VPA22</td><td>Jharkhand</td><td>98%</td><td>2%</td></tr> <tr><td>VPA23</td><td>Assam</td><td>92%</td><td>8%</td></tr> <tr><td>VPA23</td><td>Bihar</td><td>98%</td><td>2%</td></tr> <tr><td>VPA23</td><td>Chhattisgarh</td><td>94%</td><td>6%</td></tr> <tr><td>VPA23</td><td>Jharkhand</td><td>95%</td><td>6%</td></tr> <tr><td>VPA23</td><td>Karnataka</td><td>92%</td><td>8%</td></tr> <tr><td>VPA23</td><td>Kerala</td><td>95%</td><td>5%</td></tr> <tr><td>VPA23</td><td>Maharashtra</td><td>96%</td><td>4%</td></tr> <tr><td>VPA23</td><td>Madhya Pradesh</td><td>91%</td><td>9%</td></tr> <tr><td>VPA23</td><td>Odisha</td><td>92%</td><td>8%</td></tr> <tr><td>VPA23</td><td>Tamil Nadu</td><td>90%</td><td>10%</td></tr> <tr><td>VPA23</td><td>Uttar Pradesh</td><td>94%</td><td>6%</td></tr> <tr><td>VPA23</td><td>West Bengal</td><td>92%</td><td>8%</td></tr> <tr><td>VPA33</td><td>Bihar</td><td>95%</td><td>5%</td></tr> <tr><td>VPA33</td><td>Punjab</td><td>93%</td><td>7%</td></tr> <tr><td>VPA33</td><td>Haryana</td><td>94%</td><td>6%</td></tr> <tr><td>VPA34</td><td>Madhya Pradesh</td><td>94%</td><td>6%</td></tr> </tbody> </table>			VPA	State	Three-stone fired	Gas Stove	VPA22	Bihar	95%	5%	VPA22	Tamil Nadu	97%	3%	VPA22	Jharkhand	98%	2%	VPA23	Assam	92%	8%	VPA23	Bihar	98%	2%	VPA23	Chhattisgarh	94%	6%	VPA23	Jharkhand	95%	6%	VPA23	Karnataka	92%	8%	VPA23	Kerala	95%	5%	VPA23	Maharashtra	96%	4%	VPA23	Madhya Pradesh	91%	9%	VPA23	Odisha	92%	8%	VPA23	Tamil Nadu	90%	10%	VPA23	Uttar Pradesh	94%	6%	VPA23	West Bengal	92%	8%	VPA33	Bihar	95%	5%	VPA33	Punjab	93%	7%	VPA33	Haryana	94%	6%	VPA34	Madhya Pradesh	94%	6%
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Choice of data or Measurement methods and procedures	Baseline survey and studies by academia, NGOs or multilateral institutions.																																																																																		
Purpose of data	Calculation of baseline emissions																																																																																		
Additional comment	This parameter is fixed Ex-ante & shall be updated at CP renewal.																																																																																		

Parameter ID	SDWS 9
Data/parameter	EF_{b,f,CO_2}
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 and LPG
Value(s) applied	Firewood – 112 LPG – 63.1
Choice of data or Measurement methods and procedures	Default IPCC value for fuelwood/LPG is applied
Purpose of data	Calculation of baseline emissions
Additional comment	-

Parameter ID	SDWS 10
Data/parameter	$EF_{b,f,non-CO_2}$
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 is applied
Purpose of data	Calculation of baseline emissions
Additional comment	-

Parameter ID	SDWS 11
Data/parameter	η_{wb}
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 Measurement methods and procedures	Default defined in “Methodology for Emission Reductions from Safe Drinking Water Supply” v1.0 for traditional stove. Literature review for gas stove efficiency.
Purpose of data	Calculation of Baseline emissions
Additional comment	-

Parameter ID	SDWS 12																																												
Data/parameter	C_b																																												
Unit	Percentage																																												
Description	Proportion of project end-users who in the baseline were already using safe water, either from an improved water source, or from a water treatment method other than boiling																																												
Source of data	Baseline survey/Published literature for project region																																												
Value(s) applied	<table><tr><th>VPA</th><th>State</th><th>C_b</th></tr><tr><td>VPA22</td><td>Bihar</td><td>5.69%</td></tr><tr><td>VPA22</td><td>Tamil Nadu</td><td>5.72%</td></tr><tr><td>VPA22</td><td>Jharkhand</td><td>1.54%</td></tr><tr><td>VPA23</td><td>Assam</td><td>5.4%</td></tr><tr><td>VPA23</td><td>Bihar</td><td>5.6%</td></tr><tr><td>VPA23</td><td>Chhattisgarh</td><td>5.2%</td></tr><tr><td>VPA23</td><td>Jharkhand</td><td>4.8%</td></tr><tr><td>VPA23</td><td>Karnataka</td><td>5.2%</td></tr><tr><td>VPA23</td><td>Kerala</td><td>5.3%</td></tr><tr><td>VPA23</td><td>Maharashtra</td><td>5.8%</td></tr><tr><td>VPA23</td><td>Madhya Pradesh</td><td>6.2%</td></tr><tr><td>VPA23</td><td>Odisha</td><td>4.4%</td></tr><tr><td>VPA23</td><td>Tamil Nadu</td><td>5.3%</td></tr></table>			VPA	State	C_b	VPA22	Bihar	5.69%	VPA22	Tamil Nadu	5.72%	VPA22	Jharkhand	1.54%	VPA23	Assam	5.4%	VPA23	Bihar	5.6%	VPA23	Chhattisgarh	5.2%	VPA23	Jharkhand	4.8%	VPA23	Karnataka	5.2%	VPA23	Kerala	5.3%	VPA23	Maharashtra	5.8%	VPA23	Madhya Pradesh	6.2%	VPA23	Odisha	4.4%	VPA23	Tamil Nadu	5.3%
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	VPA23	West Bengal	5.3%
	VPA33	Bihar	5.18%
	VPA33	Punjab	6.91%
	VPA33	Haryana	6.36%
	VPA34	Madhya Pradesh	5.1%
Choice of data or Measurement methods and procedures	Baseline Study and Official government publications or statistics.		
Purpose of data	Calculation of baseline emissions		
Additional comment	The safe water sources and percentages shall be consistent with the information reported for parameter Water sources in the project boundary (SWDS 5). Users who have access to a source of safe water in the baseline (either from an improved water source, or from a water treatment method other than boiling) may not be credited under the project, unless project demonstrates that the baseline source of water does not meet safe water quality criteria, by conducting water quality tests over a representative period of time of 6 months or by referring to credible published literature or other sources. This parameter is fixed Ex-ante & shall be updated at CP renewal.		

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	HUL Pureit – 9 L/h EFL Nakshatra, EFL Asha and EFL Sampurna – 10L/h
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.
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Parameter ID	SDWS 21
Data/parameter	$f_{NRB,b,i,y}$
Unit	Fractional non-renewability
Description	Fractional non-renewability status of woody biomass fuel during year y, in case the baseline fuel is biomass
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 Measurement methods and procedures	A preliminary study has been conducted in accordance with the CDM Methodological tool 30: Calculation of the 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 Measurement methods and procedures	The default value of other kerosene in 2006 IPCC guidelines for National Greenhouse Gas Inventories is 71.900 tCO ₂ /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
Value(s) applied	1.29
Choice of data or Measurement methods and procedures	The statistical standard value for standard normal for a confidence level of 90% for one-sided test which is 1.290 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

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Water Purification System

SDG 13

VPA23: GS11499, VPA33: GS11490¹³

Parameter ID	SDWS 18																																						
Data/parameter	$M_{q,y}$																																						
Unit	Fraction																																						
Description	Ongoing water quality indicated as the fraction of the samples that pass microbial quality standard requirements specified in relevant microbial quality standard for drinking water of the host country. In case a national standard is not available, the water quality shall comply with WHO Guideline values for verification of microbial quality i.e., all water directly intended for drinking must not have detectable E.Coli in any 100 ml sample i.e., less than 1 Colony Forming Unit (CFU) of E.Coli /100 ml																																						
Source of data	Testing of water at the exits of the treatment technology for a representative sample of end-users																																						
Value(s) applied	<table> <tr> <th>VPA</th><th>Partner</th><th>Model - State</th><th>M_q</th></tr> <tr> <td>VPA23</td><td>Asirvad</td><td>EFL Nakshatra - Assam</td><td>1</td></tr> <tr> <td>VPA23</td><td>Asirvad</td><td>EFL Nakshatra - Bihar</td><td>1</td></tr> <tr> <td>VPA23</td><td>Asirvad</td><td>EFL Nakshatra - Chhattisgarh</td><td>1</td></tr> <tr> <td>VPA23</td><td>Asirvad</td><td>EFL Nakshatra - Jharkhand</td><td>1</td></tr> <tr> <td>VPA23</td><td>Asirvad</td><td>EFL Nakshatra - Karnataka</td><td>1</td></tr> <tr> <td>VPA23</td><td>Asirvad</td><td>EFL Nakshatra - Kerala</td><td>1</td></tr> <tr> <td>VPA23</td><td>Asirvad</td><td>EFL Nakshatra - Maharashtra</td><td>1</td></tr> <tr> <td>VPA23</td><td>Asirvad</td><td>EFL Nakshatra - Madhya Pradesh</td><td>1</td></tr> </table>			VPA	Partner	Model - State	M_q	VPA23	Asirvad	EFL Nakshatra - Assam	1	VPA23	Asirvad	EFL Nakshatra - Bihar	1	VPA23	Asirvad	EFL Nakshatra - Chhattisgarh	1	VPA23	Asirvad	EFL Nakshatra - Jharkhand	1	VPA23	Asirvad	EFL Nakshatra - Karnataka	1	VPA23	Asirvad	EFL Nakshatra - Kerala	1	VPA23	Asirvad	EFL Nakshatra - Maharashtra	1	VPA23	Asirvad	EFL Nakshatra - Madhya Pradesh	1
VPA	Partner	Model - State	M_q																																				
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VPA23	Asirvad	EFL Nakshatra - Bihar	1																																				
VPA23	Asirvad	EFL Nakshatra - Chhattisgarh	1																																				
VPA23	Asirvad	EFL Nakshatra - Jharkhand	1																																				
VPA23	Asirvad	EFL Nakshatra - Karnataka	1																																				
VPA23	Asirvad	EFL Nakshatra - Kerala	1																																				
VPA23	Asirvad	EFL Nakshatra - Maharashtra	1																																				
VPA23	Asirvad	EFL Nakshatra - Madhya Pradesh	1																																				

	VPA23	Asirvad	EFL Nakshatra - Odisha	1
	VPA23	Asirvad	EFL Nakshatra - Tamil Nadu	1
	VPA23	Asirvad	EFL Nakshatra - Uttar Pradesh	1
	VPA23	Asirvad	EFL Nakshatra - West Bengal	1
	VPA23	Midland	EFL Nakshatra - Bihar	1
	VPA23	Samasta	EFL Sampoorna - Bihar	1
	VPA23	Svasti	EFL Asha - Madhya Pradesh	1
	VPA23	Svasti	EFL Asha - Maharashtra -	1
	VPA33	Midland	EFL Nakshatra - Bihar	1
	VPA33	Midland	HUL Pureit - Punjab	1
	VPA33	Midland	HUL Pureit - Haryana	1
Measurement methods and procedures	Water samples are collected from selected sample households and tested for pathogens in line with the potable 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 the VPA 23 and 33, 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 VPA23 and 93% households in VPA33 found to fulfil “basic” hygiene practices which means availability of a handwashing facility with soap and water at home. 85.15% of households in VPA23 and 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.
Measurement methods and procedures	A questionnaire-based survey has been used to assess hygienic handling of clean water as per CME knowledge and 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	-
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Parameter ID	SDWS 22			
Data/parameter	$X_{cleanboil,y}$			
Unit	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 survey			
Value(s) applied	VPA	Partner	Model - State	$X_{cleanboil}$
	VPA23	Asirvad	EFL Nakshatra - Assam	0%
	VPA23	Asirvad	EFL Nakshatra - Bihar	0%
	VPA23	Asirvad	EFL Nakshatra - Chhattisgarh	0%
	VPA23	Asirvad	EFL Nakshatra - Jharkhand	0%
	VPA23	Asirvad	EFL Nakshatra - Karnataka	0%
	VPA23	Asirvad	EFL Nakshatra - Kerala	0%
	VPA23	Asirvad	EFL Nakshatra - Maharashtra	0%
	VPA23	Asirvad	EFL Nakshatra - Madhya Pradesh	0%
	VPA23	Asirvad	EFL Nakshatra - Odisha	0%
	VPA23	Asirvad	EFL Nakshatra - Tamil Nadu	0%
	VPA23	Asirvad	EFL Nakshatra - Uttar Pradesh	0%
	VPA23	Asirvad	EFL Nakshatra - West Bengal	0%
	VPA23	Midland	EFL Nakshatra - Bihar	0%
	VPA23	Samasta	EFL Sampoorna - Bihar	0%
	VPA23	Svasti	EFL Asha - Madhya Pradesh	0%
	VPA23	Svasti	EFL Asha - Maharashtra -	0%

	VPA33	Midland	EFL Nakshatra - Bihar	0%
	VPA33	Midland	HUL Pureit Punjab	0%
	VPA33	Midland	HUL Pureit Haryana	0%
Measurement methods and procedures	Sampling survey is carried out to determine the value			
Monitoring Frequency	Annual			
QA/QC Procedures	-			
Purpose of data	Calculation of baseline emissions			
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
	VPA23	Asirvad	EFL Nakshatra - Assam
	VPA23	Asirvad	EFL Nakshatra - Bihar
	VPA23	Asirvad	EFL Nakshatra - Chhattisgarh
	VPA23	Asirvad	EFL Nakshatra - Jharkhand
	VPA23	Asirvad	EFL Nakshatra - Karnataka
	VPA23	Asirvad	EFL Nakshatra - Kerala
	VPA23	Asirvad	EFL Nakshatra - Maharashtra
	VPA23	Asirvad	EFL Nakshatra - Madhya Pradesh
	VPA23	Asirvad	EFL Nakshatra - Odisha
	VPA23	Asirvad	EFL Nakshatra - Tamil Nadu

	VPA23	Asirvad	EFL Nakshatra - Uttar Pradesh	4.63
	VPA23	Asirvad	EFL Nakshatra - West Bengal	4.73
	VPA23	Midland	EFL Nakshatra - Bihar	4.22
	VPA23	Samasta	EFL Sampoorna - Bihar	4.59
	VPA23	Svasti	EFL Asha - Madhya Pradesh	4.67
	VPA23	Svasti	EFL Asha - Maharashtra -	4.50
	VPA33	Midland	EFL Nakshatra - Bihar	4.38
	VPA33	Midland	HUL Pureit - Punjab	4.44
	VPA33	Midland	HUL Pureit - Haryana	4.29
Measurement methods and procedures	The Pureit, Nakshatra, Asha and Sampoorna model water purifier has a capacity of 23 litres, 16 litres, 11 litres and 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 than normal days hence, weekends and festive days are avoided.			
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	Calculation of baseline emissions			
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	Partner	Model - State	Project Survey	Census
	VPA23	Asirvad	EFL Nakshatra - Assam	5.07	4.9
	VPA23	Asirvad	EFL Nakshatra -Bihar	5.76	5.5
	VPA23	Asirvad	EFL Nakshatra -Chhattisgarh	4.75	4.5
	VPA23	Asirvad	EFL Nakshatra -Jharkhand	5.37	5.3
	VPA23	Asirvad	EFL Nakshatra -Karnataka	4.72	4.5
	VPA23	Asirvad	EFL Nakshatra -Kerala	4.88	4.2
	VPA23	Asirvad	EFL Nakshatra -Maharashtra	4.87	4.6
	VPA23	Asirvad	EFL Nakshatra -Madhya Pradesh	5.15	4.8
	VPA23	Asirvad	EFL Nakshatra -Odisha	4.52	4.3
	VPA23	Asirvad	EFL Nakshatra -Tamil Nadu	4.18	3.9
	VPA23	Asirvad	EFL Nakshatra -Uttar Pradesh	5.85	6.0
	VPA23	Asirvad	EFL Nakshatra -West Bengal	4.84	4.5
	VPA23	Midland	EFL Nakshatra - Bihar	5.63	5.5
	VPA23	Samasta	EFL Sampoorna - Bihar	5.92	5.5
	VPA23	Svasti	EFL Asha - Madhya Pradesh	5.00	4.8
	VPA23	Svasti	EFL Asha - Maharashtra -	4.98	4.6

	VPA33	Midland	EFL Nakshatra - Bihar	5.30	5.5
	VPA33	Midland	HUL Pureit - Punjab	4.83	5
	VPA33	Midland	HUL Pureit - Haryana	4.87	5.2
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 baseline emissions				
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.				

Parameter ID	SDWS 28			
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 distribution records			
Value(s) applied	VPA	Partner	Model - State	$N_{p,y}$
	VPA23	Asirvad	EFL Nakshatra - Assam	346
	VPA23	Asirvad	EFL Nakshatra - Bihar	3931
	VPA23	Asirvad	EFL Nakshatra - Chhattisgarh	356
	VPA23	Asirvad	EFL Nakshatra - Jharkhand	379
	VPA23	Asirvad	EFL Nakshatra - Karnataka	670
	VPA23	Asirvad	EFL Nakshatra - Kerala	527

	VPA23	Asirvad	EFL Nakshatra - Maharashtra	1533
	VPA23	Asirvad	EFL Nakshatra - Madhya Pradesh	378
	VPA23	Asirvad	EFL Nakshatra - Odisha	539
	VPA23	Asirvad	EFL Nakshatra - Tamil Nadu	227
	VPA23	Asirvad	EFL Nakshatra - Uttar Pradesh	5157
	VPA23	Asirvad	EFL Nakshatra - West Bengal	1913
	VPA23	Midland	EFL Nakshatra - Bihar	91
	VPA23	Samasta	EFL Sampurna - Bihar	24
	VPA23	Svasti	EFL Asha - Madhya Pradesh	67
	VPA23	Svasti	EFL Asha - Maharashtra -	180
	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 i. Date of sale/distribution ii. Geographic area of sale iii. Model/type of project technology sold iv. 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 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	Percentage			
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	Partner	Model - State	$U_{p,y}$
	VPA23	Asirvad	EFL Nakshatra - Assam	87.87%
	VPA23	Asirvad	EFL Nakshatra - Bihar	88.09%
	VPA23	Asirvad	EFL Nakshatra - Chhattisgarh	89.75%
	VPA23	Asirvad	EFL Nakshatra - Jharkhand	92.44%
	VPA23	Asirvad	EFL Nakshatra - Karnataka	89.85%
	VPA23	Asirvad	EFL Nakshatra - Kerala	87.72%
	VPA23	Asirvad	EFL Nakshatra - Maharashtra	88.97%
	VPA23	Asirvad	EFL Nakshatra - Madhya Pradesh	92.29%
	VPA23	Asirvad	EFL Nakshatra - Odisha	90.55%
	VPA23	Asirvad	EFL Nakshatra - Tamil Nadu	87.54%

	VPA23	Asirvad	EFL Nakshatra - Uttar Pradesh	77.98%
	VPA23	Asirvad	EFL Nakshatra - West Bengal	86.18%
	VPA23	Midland	EFL Nakshatra - Bihar	85.90%
	VPA23	Samasta	EFL Sampoorna - Bihar	91.67%
	VPA23	Svasti	EFL Asha - Madhya Pradesh	90.15%
	VPA23	Svasti	EFL Asha - Maharashtra -	90.00%
	VPA33	Midland	EFL Nakshatra - Bihar	80.39%
	VPA33	Midland	HUL Pureit - Punjab	82.32%
	VPA33	Midland	HUL Pureit - Haryana	76.67%
Measurement methods and procedures	Option 1: In-person survey of project premises.			
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 and procedures	Option 3. Default of 5 hours
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 distribution records.																																																																														
Value(s) applied	<table> <tr> <th>VPA</th><th>Partner</th><th>Model - State</th><th>$DP_{p,y}$</th></tr> <tr> <td>VPA23</td><td>Asirvad</td><td>EFL Nakshatra - Assam</td><td>351</td></tr> <tr> <td>VPA23</td><td>Asirvad</td><td>EFL Nakshatra - Bihar</td><td>360</td></tr> <tr> <td>VPA23</td><td>Asirvad</td><td>EFL Nakshatra - Chhattisgarh</td><td>353</td></tr> <tr> <td>VPA23</td><td>Asirvad</td><td>EFL Nakshatra - Jharkhand</td><td>356</td></tr> <tr> <td>VPA23</td><td>Asirvad</td><td>EFL Nakshatra - Karnataka</td><td>358</td></tr> <tr> <td>VPA23</td><td>Asirvad</td><td>EFL Nakshatra - Kerala</td><td>349</td></tr> <tr> <td>VPA23</td><td>Asirvad</td><td>EFL Nakshatra - Maharashtra</td><td>360</td></tr> <tr> <td>VPA23</td><td>Asirvad</td><td>EFL Nakshatra - Madhya Pradesh</td><td>355</td></tr> <tr> <td>VPA23</td><td>Asirvad</td><td>EFL Nakshatra - Odisha</td><td>358</td></tr> <tr> <td>VPA23</td><td>Asirvad</td><td>EFL Nakshatra - Tamil Nadu</td><td>344</td></tr> <tr> <td>VPA23</td><td>Asirvad</td><td>EFL Nakshatra - Uttar Pradesh</td><td>359</td></tr> <tr> <td>VPA23</td><td>Asirvad</td><td>EFL Nakshatra - West Bengal</td><td>358</td></tr> <tr> <td>VPA23</td><td>Midland</td><td>EFL Nakshatra - Bihar</td><td>329</td></tr> <tr> <td>VPA23</td><td>Samasta</td><td>EFL Sampoorna - Bihar</td><td>335</td></tr> <tr> <td>VPA23</td><td>Svasti</td><td>EFL Asha - Madhya Pradesh</td><td>332</td></tr> <tr> <td>VPA23</td><td>Svasti</td><td>EFL Asha - Maharashtra -</td><td>349</td></tr> <tr> <td>VPA33</td><td>Midland</td><td>EFL Nakshatra - Bihar</td><td>354</td></tr> <tr> <td>VPA33</td><td>Midland</td><td>HUL Pureit - Punjab</td><td>354</td></tr> </table>			VPA	Partner	Model - State	$DP_{p,y}$	VPA23	Asirvad	EFL Nakshatra - Assam	351	VPA23	Asirvad	EFL Nakshatra - Bihar	360	VPA23	Asirvad	EFL Nakshatra - Chhattisgarh	353	VPA23	Asirvad	EFL Nakshatra - Jharkhand	356	VPA23	Asirvad	EFL Nakshatra - Karnataka	358	VPA23	Asirvad	EFL Nakshatra - Kerala	349	VPA23	Asirvad	EFL Nakshatra - Maharashtra	360	VPA23	Asirvad	EFL Nakshatra - Madhya Pradesh	355	VPA23	Asirvad	EFL Nakshatra - Odisha	358	VPA23	Asirvad	EFL Nakshatra - Tamil Nadu	344	VPA23	Asirvad	EFL Nakshatra - Uttar Pradesh	359	VPA23	Asirvad	EFL Nakshatra - West Bengal	358	VPA23	Midland	EFL Nakshatra - Bihar	329	VPA23	Samasta	EFL Sampoorna - Bihar	335	VPA23	Svasti	EFL Asha - Madhya Pradesh	332	VPA23	Svasti	EFL Asha - Maharashtra -	349	VPA33	Midland	EFL Nakshatra - Bihar	354	VPA33	Midland	HUL Pureit - Punjab	354
VPA	Partner	Model - State	$DP_{p,y}$																																																																												
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VPA33	Midland	HUL Pureit - Punjab	354																																																																												

	VPA33	Midland	HUL Pureit - Haryana	354
Measurement methods and procedures	This is calculated as the total days from date of installation 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

SDG 13

VPA22: GS11500

Data / Parameter	In
Unit	Lumens
Description	Lumen output of each solar lamp n deployed as part of project activity
Source of data	Refer to table 5 section B.4 in VPA-DD
Value(s) applied	1.CL1LT1F1HLS – 140.538 (Manufacturer's specification gives lumen output of 650 Lumens, however, the lumen value is

capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

2.CL1LT2HLS - 140.538 (Manufacturer's specification gives lumen output of 1100 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

3.CL2HLS - 140.538 (Manufacturer's specification gives lumen output of 400 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

4.CL2LT2HLS - 140.538 (Manufacturer's specification gives lumen output of 1650 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

5.CL3LT1HLS - 140.538 (Manufacturer's specification gives lumen output of 1050 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

6.CL3LT1HLS2 - 140.538 (Manufacturer's specification gives lumen output of 1050 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

7.CLT1HLS - 140.538 (Manufacturer's specification gives lumen output of 450 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

8.CLT2F1HLS - 140.538 (Manufacturer's specification gives lumen output of 1250 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

9.CLT2HLS - 140.538 (Manufacturer's specification gives lumen output of 1250 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

10. PL1LT3F1HLS - 140.538 (Manufacturer's specification gives lumen output of 1900 Lumens, however, the lumen

value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

11.PL1LT3F2HLS - 140.538 (Manufacturer's specification gives lumen output of 1250 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

12.PL1LT5HLS - 140.538 (Manufacturer's specification gives lumen output of 1900 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

13.PL2LT6F1HLS - 140.538 (Manufacturer's specification gives lumen output of 6950 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

14.PL2LT8F2HLS - 140.538 (Manufacturer's specification gives lumen output of 1430 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

15.PLT3F1HLS - 140.538 (Manufacturer's specification gives lumen output of 3400 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

16.PLT4HLS - 140.538 (Manufacturer's specification gives lumen output of 1700 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

17. PLT6HLS - 140.538 (Manufacturer's specification gives lumen output of 2150 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

18. SKDLT3 - 140.538 (Manufacturer's specification gives lumen output of 1350 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

19. PL1LT3F1HLS2 - 140.538 (Manufacturer's specification gives lumen output of 3750 Lumens, however, the lumen

value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

20. CL1LT1HLS - 140.538 (Manufacturer's specification gives lumen output of 650 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

21. PL1LT3HLS - 140.538 (Manufacturer's specification gives lumen output of 2750 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

22. d.light S500 - 140.538 (Manufacturer's specification gives lumen output of 240 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

23. Greenlight Planet Home Lighting System (Sunking HLS) - 140.538 (Manufacturer's specification gives lumen output of 400 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

24. Greenlight Planet Pro-400 (Sunking Pro-400) - 140.538 (Manufacturer's specification gives lumen output of 400 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

25. d.light S100 - 65 Manufacturer's specification gives lumen output of 65 Lumens, however, the lumen value is lesser than capped at 140.538 and hence 65 is applied to calculate emission reductions)

26. d.light ST100 - 140.538 (Manufacturer's specification gives lumen output of 220 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

27. d.light D333 - 140.538 (Manufacturer's specification gives lumen output of 520 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

28. d.light S550 - 140.538 (Manufacturer's specification gives lumen output of 240 Lumens, however, the lumen value is

capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

29. Greenlight Planet Boom (Sunking Boom) - 140.538 (Manufacturer's specification gives lumen output of 160 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

30. Greenlight Planet Torch (Sunking Torch) - 140.538 (Manufacturer's specification gives lumen output of 300 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

31. Greenlight Planet Pro 200 (Sunking Pro 200) - 140.538 (Manufacturer's specification gives lumen output of 200 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

32. Greenlight Planet Pro X Plus (Sunking Pro X Plus) - 140.538 (Manufacturer's specification gives lumen output of 240 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

33. RAL Duron Mitva MS 16C – 80 (Manufacturer's specification gives lumen output of 80 Lumens which is lesser than lumen cap of 140.538 and hence 80 is applied to calculate emission reductions)

34. Glosolar miniHLS: 140.538 (Manufacturer's specification gives lumen output of 400 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

35. Jugnu Light box L2005 140.538 (Manufacturer's specification gives lumen output of 200 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

36. Sunking Pico Plus 50 Lumens (Manufacturer's specification gives lumen output of 50 Lumens which is less than the lumen cap of 140.538 and hence 50 is applied to calculate emission reductions)

37. Jugnu 2 Tubelight - 140.538 (Manufacturer's specification gives lumen output of 440 Lumens, however, the lumen value

	is capped at 140.538 and hence 140.538 is applied to calculate emission reductions) 38. RAL Duron Mitva MST 952A - 140.538 (Manufacturer's specification gives lumen output of 400 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)
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	Model	Total Sales
	SKDRDP	
	CL1LT1F1HLS	50
	CL1LT2HLS	2,237
	CL2HLS	634
	CL2LT2HLS	2,131
	CL3LT1 HLS	197
	CL3LT1 HLS2	231
	CLT1 HLS	75
	CLT2 HLS	652
	CLT2F1HLS	397
	PL1LT3F1HLS	144
	PL1LT3F2HLS	53
	PL1LT5HLS	16
	PL2LT6F1HLS	23
	PL2LT8F2HLS	8
	PLT3F1HLS	143
	PLT4 HLS	27
	PLT6HLS	62
	SKDLT3	3,393
	PL1LT3F1HLS2	66
	CL1LT1HLS	1,134
	PL1LT3HLS	141
	d.light	
	d.light S500 (BH)	76
	d.light S500 (HR)	408
	d.light S500 (HP)	56
	d.light S500 (KA)	5,772
	d.light S500 (KL)	1,637
	d.light S500 (OD)	4,644
	d.light S500 (PJ)	814
	d.light S500 (RJ)	3,480
	d.light S500 (UP)	2,801

	d.light S500 (UK)	6
	Arohan	
	d.light S100 (CG)	40
	d.light S100 (OD)	311
	d.light S100 (JK)	235
	d.light S100 (WB)	645
	d.light S500 (AS)	11,074
	d.light S500 (BH)	21
	d.light S500 (JK)	21
	d.light S500 (MG)	254
	d.light S500 (OD)	6
	d.light S500 (WB)	926
	d.light S500 (TR)	376
	d.light ST100 (AS)	2
	d.light ST100 (BH)	2,681
	d.light ST100 (CG)	519
	d.light ST100 (JK)	1,799
	d.light ST100 (MP)	355
	d.light ST100 (OD)	859
	d.light ST100 (WB)	3,509
	Samasta	
	d.light D333 (AS)	20
	d.light D333 (CG)	3
	d.light D333 (KA)	1
	d.light D333 (OD)	32
	d.light D333 (RJ)	9
	d.light D333 (TN)	53
	d.light D333 (WB)	4
	d.light D333 (KL)	2
	d.light S550 (AS)	13
	d.light S550 (BH)	3
	d.light S550 (CG)	1
	d.light S550 (KA)	7
	d.light S550 (OD)	247

	d.light S550 (RJ)	171
	d.light S550 (TN)	148
	d.light S550 (WB)	10
	d.light S550 (KL)	6
	Sunking HLS (BH)	236
	Sunking HLS (CG)	1
	Sunking HLS (GOA)	4
	Sunking HLS (GJ)	89
	Sunking HLS (KA)	108
	Sunking HLS (MP)	3
	Sunking HLS (MH)	19
	Sunking HLS (OD)	69
	Sunking HLS (RJ)	87
	Sunking HLS (TN)	85
	Sunking HLS (WB)	1
	Sunking Pro -400 (BH)	1,818
	Sunking Pro -400 (CG)	1
	Sunking Pro -400 (GOA)	7
	Sunking Pro -400 (GJ)	50
	Sunking Pro -400 (KA)	235
	Sunking Pro -400 (MP)	6
	Sunking Pro -400 (MH)	42
	Sunking Pro -400 (OD)	299
	Sunking Pro -400 (RJ)	757
	Sunking Pro -400 (TN)	188
	Sunking Pro -400 (WB)	52
	Sunking Pro -400 (KL)	1
	d.light S500 (TN)	48
	d.light S500 (OD)	6
	d.light S500 (CG)	1
	Sunking Boom (BH)	289
	Sunking Boom (GJ)	380
	Sunking Boom (KA)	63
	Sunking Boom (RJ)	96

	Sunking Boom (TN)	98
	Sunking Boom (MH)	3
	Sunking Boom (OD)	6
	Sunking Boom (PD)	3
	Sunking Boom (WB)	11
	Midland	
	d.light S550 (BH)	5,049
	d.light S550 (UP)	1,723
	d.light S550 (JK)	60
	Sunking Torch (PJ)	301
	Sunking Torch (HR)	1
	Sunking Boom (HR)	63
	Sunking Boom (PJ)	398
	Sunking Boom (RJ)	787
	Sunking Boom (UP)	5
	Sunking Pro 200 (HR)	140
	Sunking Pro 200 (RJ)	2,316
	Sunking Pro 200 (PJ)	1
	RAL Duron Mitva MST 952A (JK)	1,392
	Arman	
	d.light ST100 (MP)	49
	d.light ST100 (RJ)	174
	d.light ST100 (MH)	11
	Sunking Boom (RJ)	280
	Sunking Boom (MH)	768
	Sunking Boom (MP)	67
	Sunking Boom (GJ)	8,964
	GLP India	
	Sunking Boom (AP)	35
	Sunking Boom (BH)	279
	Sunking Boom (CG)	213
	Sunking Boom (GJ)	3,739
	Sunking Boom (KA)	4,787
	Sunking Boom (MP)	563

	Sunking Boom (MH)	1,926
	Sunking Boom (OD)	74
	Sunking Boom (RJ)	6,182
	Sunking Boom (TN)	4,950
	Sunking Boom (UP)	37
	Sunking Boom (UK)	125
	Sunking Boom (WB)	10
	Sunking Boom (HR)	25
	Sunking HLS (AP)	4
	Sunking HLS (BH)	6
	Sunking HLS (GJ)	1
	Sunking HLS (KA)	90
	Sunking HLS (MH)	38
	Sunking HLS (OD)	41
	Sunking HLS (TN)	777
	Sunking HLS (WB)	4
	Sunking Pro- 200 (BH)	258
	Sunking Pro- 200 (CG)	1,022
	Sunking Pro- 200 (HR)	295
	Sunking Pro- 200 (MP)	4,762
	Sunking Pro- 200 (MH)	2,047
	Sunking Pro- 200 (OD)	164
	Sunking Pro- 200 (RJ)	512
	Sunking Pro- 200 (UP)	1,789
	Sunking Pro- 200 (UK)	18
	Sunking Pro- 200 (WB)	10
	Sunking Pro 400 (AP)	71
	Sunking Pro 400 (BH)	203
	Sunking Pro 400 (CG)	53
	Sunking Pro 400 (GJ)	120
	Sunking Pro 400 (KA)	319
	Sunking Pro 400 (MP)	10
	Sunking Pro 400 (MH)	408
	Sunking Pro 400 (OD)	72

	Sunking Pro 400 (RJ)	626
	Sunking Pro 400 (TN)	43
	Sunking Pro 400 (WB)	42
	Sunking pro X plus (BH)	37,545
	Sunking pro X plus (CG)	718
	Sunking pro X plus (JK)	9,968
	Sunking pro X plus (KA)	1
	Sunking pro X plus (MP)	496
	Sunking pro X plus (MH)	4,062
	Sunking pro X plus (OD)	1
	Sunking pro X plus (PJ)	2
	Sunking pro X plus (RJ)	3
	Sunking pro X plus (WB)	23,217
	Sunking Torch(OD)	29
	Sunking Torch(BH)	42
	Sunking Torch(WB)	4
	ESAF	
	Sunking Pico Plus (BH)	4
	Sunking Pico Plus (CG)	119
	Sunking Pico Plus (JK)	2
	Sunking Pico Plus (KL)	2,994
	Sunking Pico Plus (MH)	1
	Sunking Pico Plus (TN)	181
	Sunking HLS(BH)	5
	Sunking HLS(JK)	2
	Sunking HLS(KL)	599
	Sunking HLS(TN)	49
	RAL Duron Mitva MS-16C(KL)	3,172
	Asirvad	
	Glosolar Mini HLS(BH)	635
	Glosolar Mini HLS(CG)	2
	Glosolar Mini HLS(JH)	324
	Glosolar Mini HLS(MP)	1,722
	Glosolar Mini HLS(OD)	547

	Glosolar Mini HLS(PJ)	247
	Glosolar Mini HLS(RJ)	315
	Glosolar Mini HLS(TN)	3482
	Glosolar Mini HLS(UP)	314
	Jugnu 2 Tubelight(BH)	11
	Jugnu 2 Tubelight(OD)	10
	Jugnu 2 Tubelight(TN)	18
	Jugnu 2 Tubelight(HR)	10
	Jugnu 2 Tubelight(UP)	33
	Jugnu Lightbox L2005(BH)	987
	Jugnu Lightbox L2005(GJ)	545
	Jugnu Lightbox L2005(HR)	19
	Jugnu Lightbox L2005(KA)	2
	Jugnu Lightbox L2005(KL)	1
	Jugnu Lightbox L2005(OD)	5
	Jugnu Lightbox L2005(TN)	16
	Jugnu Lightbox L2005(UP)	41
	Jugnu Lightbox L2005(UK)	4
	Jugnu Lightbox L2005(WB)	304
	Sunking Boom(CG)	1
	Sunking Boom(GOA)	42
	Sunking Boom(JK)	11
	Sunking Boom(KA)	4374
	Sunking Boom(KL)	216
	Sunking Boom(MP)	1
	Sunking Boom(MH)	1
	Sunking Boom(TN)	4
	Sunking Boom(WB)	52
	TOTAL	217,844
Measurement methods and procedures	N.A.	
Monitoring frequency	Annual	
QA/QC procedures	Each light installation is geocoded (GPS coordinates or other specific location identifiers) in the MEC Tracker System.	

	Associated data will reside in the MEC Tracker Database, allowing each installation to be monitored on a regular basis. The data in MEC tracker system can be crosschecked with the MIS system of the PO.
Purpose of data	Calculation of baseline emissions
Additional comment	21 model for SKDRDP, 6 models for Samasta, 5 models for Midland, 6 models for GLP, 1 model for d.light, 3 models for Arohan and 2 models for Arman, 3 models of ESAF and 4 models of Asirvad are distributed under this VPA.

Data / Parameter	$d_{i,a,v}$																																										
Unit	Days																																										
Description	Average number of days lamps of type i that have been deployed in period a were operating in period v																																										
Source of data	Monitoring partner, Credit Tracker																																										
Value(s) applied	<table> <tr> <th>Model</th><th>Value</th></tr> <tr> <td>SKDRDP</td><td></td></tr> <tr> <td>CL1LT1F1HLS</td><td>358</td></tr> <tr> <td>CL1LT2HLS</td><td>363</td></tr> <tr> <td>CL2HLS</td><td>362</td></tr> <tr> <td>CL2LT2HLS</td><td>362</td></tr> <tr> <td>CL3LT1HLS</td><td>361</td></tr> <tr> <td>CL3LT1HLS2</td><td>362</td></tr> <tr> <td>CLT1HLS</td><td>360</td></tr> <tr> <td>CLT2F1HLS</td><td>361</td></tr> <tr> <td>CLT2HLS</td><td>361</td></tr> <tr> <td>PL1LT3F1HLS</td><td>362</td></tr> <tr> <td>PL1LT3F2HLS</td><td>358</td></tr> <tr> <td>PL1LT5HLS</td><td>365</td></tr> <tr> <td>PL2LT6F1HLS</td><td>365</td></tr> <tr> <td>PL2LT8F2HLS</td><td>365</td></tr> <tr> <td>PLT3F1HLS</td><td>360</td></tr> <tr> <td>PLT4HLS</td><td>365</td></tr> <tr> <td>PLT6HLS</td><td>353</td></tr> <tr> <td>SKDLT3</td><td>364</td></tr> <tr> <td>PL1LT3F1HLS2</td><td>359</td></tr> </table>	Model	Value	SKDRDP		CL1LT1F1HLS	358	CL1LT2HLS	363	CL2HLS	362	CL2LT2HLS	362	CL3LT1HLS	361	CL3LT1HLS2	362	CLT1HLS	360	CLT2F1HLS	361	CLT2HLS	361	PL1LT3F1HLS	362	PL1LT3F2HLS	358	PL1LT5HLS	365	PL2LT6F1HLS	365	PL2LT8F2HLS	365	PLT3F1HLS	360	PLT4HLS	365	PLT6HLS	353	SKDLT3	364	PL1LT3F1HLS2	359
Model	Value																																										
SKDRDP																																											
CL1LT1F1HLS	358																																										
CL1LT2HLS	363																																										
CL2HLS	362																																										
CL2LT2HLS	362																																										
CL3LT1HLS	361																																										
CL3LT1HLS2	362																																										
CLT1HLS	360																																										
CLT2F1HLS	361																																										
CLT2HLS	361																																										
PL1LT3F1HLS	362																																										
PL1LT3F2HLS	358																																										
PL1LT5HLS	365																																										
PL2LT6F1HLS	365																																										
PL2LT8F2HLS	365																																										
PLT3F1HLS	360																																										
PLT4HLS	365																																										
PLT6HLS	353																																										
SKDLT3	364																																										
PL1LT3F1HLS2	359																																										

	CL1LT1HLS	363
	PL1LT3HLS	362
	d.light	
	d.light S500 (BH)	360
	d.light S500 (HR)	361
	d.light S500 (HP)	358
	d.light S500 (KA)	363
	d.light S500 (KL)	361
	d.light S500 (OD)	362
	d.light S500 (PJ)	359
	d.light S500 (RJ)	363
	d.light S500 (UP)	363
	d.light S500 (UK)	365
	Arohan	
	d.light S100 (CG)	356
	d.light S100 (JK)	360
	d.light S100 (OD)	360
	d.light S100 (WB)	362
	d.light S500 (AS)	364
	d.light S500 (BH)	365
	d.light S500 (JK)	365
	d.light S500 (MG)	358
	d.light S500 (OD)	365
	d.light S500 (WB)	362
	d.light S500 (TR)	363
	d.light ST100 (AS)	365
	d.light ST100 (BH)	363
	d.light ST100 (CG)	362
	d.light ST100 (JK)	363
	d.light ST100 (MP)	361
	d.light ST100 (OD)	362
	d.light ST100 (WB)	363
	Samasta	
	d.light D333 (AS)	365

d.light D333 (CG)	365
d.light D333 (KA)	365
d.light D333 (KL)	354
d.light D333 (OD)	365
d.light D333 (RJ)	358
d.light D333 (TN)	365
d.light D333 (WB)	365
d.light S550 (AS)	365
d.light S550 (BH)	365
d.light S550 (CG)	365
d.light S550 (KA)	365
d.light S550 (OD)	362
d.light S550 (RJ)	359
d.light S550 (TN)	360
d.light S550 (WB)	365
d.light S550 (KL)	365
Sunking HLS (BH)	360
Sunking HLS (CG)	365
Sunking HLS (GOA)	365
Sunking HLS (GJ)	361
Sunking HLS (KA)	358
Sunking HLS (MP)	365
Sunking HLS (MH)	365
Sunking HLS (OD)	360
Sunking HLS (RJ)	361
Sunking HLS (TN)	356
Sunking HLS (WB)	365
Sunking Pro -400 (BH)	363
Sunking Pro -400 (CG)	365
Sunking Pro -400 (GOA)	365
Sunking Pro -400 (GJ)	358
Sunking Pro -400 (KA)	360
Sunking Pro -400 (MP)	365
Sunking Pro -400 (MH)	365

	Sunking Pro -400 (OD)	361
	Sunking Pro -400 (RJ)	362
	Sunking Pro -400 (TN)	361
	Sunking Pro -400 (WB)	358
	Sunking Pro -400 (KL)	365
	d.light S500 (TN)	357
	d.light S500 (OD)	365
	d.light S500 (CG)	365
	Sunking Boom (BH)	361
	Sunking Boom (GJ)	361
	Sunking Boom (KA)	359
	Sunking Boom (RJ)	357
	Sunking Boom (TN)	358
	Sunking Boom (MH)	365
	Sunking Boom (OD)	365
	Sunking Boom (PD)	365
	Sunking Boom (WB)	365
	Midland	
	d.light S550 (BH)	362
	d.light S550 (UP)	361
	d.light S550 (JK)	359
	Sunking Torch (PJ)	364
	Sunking Torch (HR)	365
	Sunking Boom (HR)	359
	Sunking Boom (PJ)	360
	Sunking Boom (RJ)	360
	Sunking Boom (UP)	365
	Sunking Pro 200 (HR)	360
	Sunking Pro 200 (RJ)	363
	Sunking Pro 200 (PJ)	365
	RAL Duron Mitva MST952A (JK)	363
	Arman	
	d.light ST100 (MP)	358
	d.light ST100 (RJ)	359

	d.light ST100 (MH)	365
	Sunking Boom (GJ)	363
	Sunking Boom (MP)	354
	Sunking Boom (MH)	361
	Sunking Boom (RJ)	361
	GLP India	
	Sunking Boom (AP)	365
	Sunking Boom (BH)	362
	Sunking Boom (CG)	360
	Sunking Boom (GJ)	363
	Sunking Boom (HR)	365
	Sunking Boom KA)	362
	Sunking Boom (MP)	362
	Sunking Boom (MH)	362
	Sunking Boom (OD)	360
	Sunking Boom (RJ)	363
	Sunking Boom (TN)	363
	Sunking Boom (UP)	365
	Sunking Boom (UK)	359
	Sunking Boom (WB)	365
	Sunking HLS (AP)	365
	Sunking HLS (BH)	365
	Sunking HLS (GJ)	365
	Sunking HLS (KA)	361
	Sunking HLS (MH)	365
	Sunking HLS (OD)	356
	Sunking HLS (TN)	361
	Sunking HLS (WB)	365
	Sunking Pro- 200 (BH)	361
	Sunking Pro- 200 (CG)	363
	Sunking Pro- 200 (HR)	361
	Sunking Pro- 200 (MP)	364
	Sunking Pro- 200 (MH)	363
	Sunking Pro- 200 (OD)	363

	Sunking Pro- 200 (RJ)	362
	Sunking Pro- 200 (UP)	363
	Sunking Pro- 200 (UK)	365
	Sunking Pro- 200 (WB)	365
	Sunking Pro 400 (AP)	355
	Sunking Pro 400 (BH)	360
	Sunking Pro 400 (CG)	358
	Sunking Pro 400 (GJ)	359
	Sunking Pro 400 (KA)	359
	Sunking Pro 400 (MP)	365
	Sunking Pro 400 (MH)	361
	Sunking Pro 400 (OD)	360
	Sunking Pro 400 (RJ)	360
	Sunking Pro 400 (TN)	365
	Sunking Pro 400 (WB)	365
	Sunking pro X plus (BH)	364
	Sunking pro X plus (CG)	360
	Sunking pro X plus (JK)	364
	Sunking pro X plus (KA)	365
	Sunking pro X plus (MP)	361
	Sunking pro X plus (MH)	363
	Sunking pro X plus (OD)	365
	Sunking pro X plus (PJ)	365
	Sunking pro X plus (RJ)	365
	Sunking pro X plus (WB)	364
	Sunking Torch(OD)	365
	Sunking Torch(BH)	356
	Sunking Torch(WB)	365
	ESAF	
	Sunking Pico Plus (BH)	365
	Sunking Pico Plus (CG)	362
	Sunking Pico Plus (JK)	365
	Sunking Pico Plus (KL)	364
	Sunking Pico Plus (MH)	365

	Sunking Pico Plus (TN)	361
	Sunking HLS(BH)	365
	Sunking HLS(JK)	365
	Sunking HLS(KK)	362
	Sunking HLS(TN)	358
	RAL Duron Mitva MS-16C(KL)	363
	Asirvad	
	Glosolar Mini HLS(BH)	362
	Glosolar Mini HLS(CG)	365
	Glosolar Mini HLS(JK)	362
	Glosolar Mini HLS(MP)	364
	Glosolar Mini HLS(OD)	361
	Glosolar Mini HLS(PJ)	362
	Glosolar Mini HLS(RJ)	363
	Glosolar Mini HLS(TN)	364
	Glosolar Mini HLS(UP)	362
	Jugnu 2 Tubelight(BH)	365
	Jugnu 2 Tubelight(OD)	365
	Jugnu 2 Tubelight(TN)	365
	Jugnu 2 Tubelight(UP)	354
	Jugnu 2 Tubelight(HR)	365
	Jugnu Lightbox L2005(BH)	362
	Jugnu Lightbox L2005(GJ)	362
	Jugnu Lightbox L2005(HR)	365
	Jugnu Lightbox L2005(KA)	365
	Jugnu Lightbox L2005(KL)	365
	Jugnu Lightbox L2005(OD)	365
	Jugnu Lightbox L2005(TN)	365
	Jugnu Lightbox L2005(UP)	347
	Jugnu Lightbox L2005(UK)	365
	Jugnu Lightbox L2005(WB)	363
	Sunking Boom(CG)	365
	Sunking Boom(GOA)	356
	Sunking Boom(JK)	365

	Sunking Boom(KA)	364
	Sunking Boom(KL)	362
	Sunking Boom(MP)	365
	Sunking Boom(MH)	365
	Sunking Boom(TN)	365
	Sunking Boom(WB)	358
Measurement methods and procedures	Exact date of sale (in the case of solar lights) and installation (in the case of solar home systems) for all clean energy 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 frequency	Annual	
QA/QC procedures	The data in MEC tracker system can be cross checked with the MIS system of the PO – Samasta, Midland, GLP, Asirvad, ESAF, Arohan, Arman, d.light, SKDRDP.	
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	H
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	$LFR_{i,v}$
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Unit	%	
Description	Lamp failure rate: Share of lamps of lamp type <i>i</i> in checked sample group <i>g_{i,v}</i> not operational in period <i>v</i>	
Source of data	Monitoring partner, Credit Tracker	
Value(s) applied	Model	Value
	<i>SKDRDP</i>	
	CL1LT1F1HLS	2.00%
	CL1LT2HLS	0.58%
	CL2HLS	0.79%
	CL2LT2HLS	0.75%
	CL3LT1HLS	1.02%
	CL3LT1HLS2	0.87%
	CLT1HLS	1.33%
	CLT2F1HLS	1.01%
	CLT2HLS	1.23%
	PL1LT3F1HLS	0.69%
	PL1LT3F2HLS	1.89%
	PL1LT5HLS	0.00%
	PL2LT6F1HLS	0.00%
	PL2LT8F2HLS	0.00%
	PLT3F1HLS	1.40%
	PLT4HLS	0.00%
	PLT6HLS	3.23%
	SKDLT3	0.32%
	PL1LT3F1HLS2	1.52%
	CL1LT1HLS	0.44%
	PL1LT3HLS	0.71%
	<i>d.light</i>	
	d.light S500 (BH)	1.32%
	d.light S500 (HR)	1.23%
	d.light S500 (HP)	1.79%
	d.light S500 (KA)	0.49%
	d.light S500 (KL)	0.98%
	d.light S500 (OD)	0.84%
	d.light S500 (PJ)	1.72%

	d.light S500 (RJ)	0.66%
	d.light S500 (UP)	0.68%
	d.light S500 (UK)	0.00%
	Arohan	
	d.light S100 (CG)	2.50%
	d.light S100 (JK)	1.28%
	d.light S100 (OD)	1.29%
	d.light S100 (WB)	0.93%
	d.light S500 (AS)	0.31%
	d.light S500 (BH)	0.00%
	d.light S500 (JK)	0.00%
	d.light S500 (MG)	1.97%
	d.light S500 (OD)	0.00%
	d.light S500 (WB)	0.86%
	d.light S500 (TR)	0.53%
	d.light ST100 (AS)	0.00%
	d.light ST100 (BH)	0.52%
	d.light ST100 (CG)	0.77%
	d.light ST100 (JK)	0.56%
	d.light ST100 (MP)	1.13%
	d.light ST100 (OD)	0.81%
	d.light ST100 (WB)	0.48%
	Samasta	
	d.light D333 (AS)	0.00%
	d.light D333 (CG)	0.00%
	d.light D333 (KA)	0.00%
	d.light D333 (KL)	3.13%
	d.light D333 (OD)	0.00%
	d.light D333 (RJ)	1.89%
	d.light D333 (TN)	0.00%
	d.light D333 (WB)	0.00%
	d.light S550 (AS)	0.00%
	d.light S550 (BH)	0.00%
	d.light S550 (CG)	0.00%

	d.light S550 (KA)	0.00%
	d.light S550 (OD)	0.81%
	d.light S550 (RJ)	1.75%
	d.light S550 (TN)	1.35%
	d.light S550 (WB)	0.00%
	d.light S550 (KL)	0.00%
	Sunking HLS (BH)	1.27%
	Sunking HLS (CG)	0.00%
	Sunking HLS (GOA)	0.00%
	Sunking HLS (GJ)	1.12%
	Sunking HLS (KA)	1.85%
	Sunking HLS (MP)	0.00%
	Sunking HLS (MH)	0.00%
	Sunking HLS (OD)	1.45%
	Sunking HLS (RJ)	1.15%
	Sunking HLS (TN)	2.35%
	Sunking HLS (WB)	0.00%
	Sunking Pro -400 (BH)	0.50%
	Sunking Pro -400 (CG)	0.00%
	Sunking Pro -400 (GOA)	0.00%
	Sunking Pro -400 (GJ)	2.00%
	Sunking Pro -400 (KA)	1.28%
	Sunking Pro -400 (MP)	0.00%
	Sunking Pro -400 (MH)	0.00%
	Sunking Pro -400 (OD)	1.00%
	Sunking Pro -400 (RJ)	0.79%
	Sunking Pro -400 (TN)	1.06%
	Sunking Pro -400 (WB)	1.92%
	Sunking Pro -400 (KL)	0.00%
	d.light S500 (TN)	2.08%
	d.light S500 (OD)	0.00%
	d.light S500 (CG)	0.00%
	Sunking Boom (BH)	1.04%
	Sunking Boom (GJ)	1.05%

	Sunking Boom (KA)	1.59%
	Sunking Boom (RJ)	2.08%
	Sunking Boom (TN)	2.04%
	Sunking Boom (MH)	0.00%
	Sunking Boom (OD)	0.00%
	Sunking Boom (PD)	0.00%
	Sunking Boom (WB)	0.00%
	Midland	
	d.light S550 (BH)	0.73%
	d.light S550 (UP)	0.99%
	d.light S550 (JK)	1.67%
	Sunking Torch (PJ)	0.33%
	Sunking Torch (HR)	0.00%
	Sunking Boom (HR)	1.59%
	Sunking Boom (PJ)	1.26%
	Sunking Boom (RJ)	1.40%
	Sunking Boom (UP)	0.00%
	Sunking Pro 200 (HR)	1.43%
	Sunking Pro 200 (RJ)	0.43%
	Sunking Pro 200 (PJ)	0.00%
	RAL Duron Mitva MST952A (JK)	0.50%
	Arman	
	d.light ST100 (MP)	2.04%
	d.light ST100 (RJ)	1.72%
	d.light ST100 (MH)	0.00%
	Sunking Boom (GJ)	0.47%
	Sunking Boom (MP)	2.99%
	Sunking Boom (MH)	1.04%
	Sunking Boom (RJ)	1.07%
	GLP India	
	Sunking Boom (AP)	0.00%
	Sunking Boom (BH)	0.72%
	Sunking Boom (CG)	1.41%
	Sunking Boom (GJ)	0.51%

	Sunking Boom (HR)	0.00%
	Sunking Boom KA)	0.69%
	Sunking Boom (MP)	0.89%
	Sunking Boom (MH)	0.88%
	Sunking Boom (OD)	1.35%
	Sunking Boom (RJ)	0.42%
	Sunking Boom (TN)	0.61%
	Sunking Boom (UP)	0.00%
	Sunking Boom (UK)	1.60%
	Sunking Boom (WB)	0.00%
	Sunking HLS (AP)	0.00%
	Sunking HLS (BH)	0.00%
	Sunking HLS (GJ)	0.00%
	Sunking HLS (KA)	1.11%
	Sunking HLS (MH)	0.00%
	Sunking HLS (OD)	2.44%
	Sunking HLS (TN)	1.03%
	Sunking HLS (WB)	0.00%
	Sunking Pro- 200 (BH)	1.16%
	Sunking Pro- 200 (CG)	0.49%
	Sunking Pro- 200 (HR)	1.02%
	Sunking Pro- 200 (MP)	0.38%
	Sunking Pro- 200 (MH)	0.59%
	Sunking Pro- 200 (OD)	0.61%
	Sunking Pro- 200 (RJ)	0.78%
	Sunking Pro- 200 (UP)	0.45%
	Sunking Pro- 200 (UK)	0.00%
	Sunking Pro- 200 (WB)	0.00%
	Sunking Pro 400 (AP)	2.82%
	Sunking Pro 400 (BH)	1.48%
	Sunking Pro 400 (CG)	1.89%
	Sunking Pro 400 (GJ)	1.67%
	Sunking Pro 400 (KA)	1.57%
	Sunking Pro 400 (MP)	0.00%

	Sunking Pro 400 (MH)	1.23%
	Sunking Pro 400 (OD)	1.39%
	Sunking Pro 400 (RJ)	1.28%
	Sunking Pro 400 (TN)	0.00%
	Sunking Pro 400 (WB)	0.00%
	Sunking pro X plus (BH)	0.23%
	Sunking pro X plus (CG)	1.25%
	Sunking pro X plus (JK)	0.38%
	Sunking pro X plus (KA)	0.00%
	Sunking pro X plus (MP)	1.21%
	Sunking pro X plus (MH)	0.42%
	Sunking pro X plus (OD)	0.00%
	Sunking pro X plus (PJ)	0.00%
	Sunking pro X plus (RJ)	0.00%
	Sunking pro X plus (WB)	0.18%
	Sunking Torch(OD)	2.38%
	Sunking Torch(BH)	0.00%
	Sunking Torch(WB)	0.00%
	ESAF	
	Sunking Pico Plus (BH)	0.00%
	Sunking Pico Plus (CG)	0.84%
	Sunking Pico Plus (JK)	0.00%
	Sunking Pico Plus (KL)	0.37%
	Sunking Pico Plus (MH)	0.00%
	Sunking Pico Plus (TN)	1.10%
	Sunking HLS(BH)	0.00%
	Sunking HLS(JK)	0.00%
	Sunking HLS(KK)	0.83%
	Sunking HLS(TN)	2.04%
	RAL Duron Mitva MS-16C(KL)	0.44%
	Asirvad	
	Glosolar Mini HLS(BH)	0.94%
	Glosolar Mini HLS(CG)	0.00%
	Glosolar Mini HLS(JK)	0.93%

	Glosolar Mini HLS(MP)	0.29%
	Glosolar Mini HLS(OD)	1.10%
	Glosolar Mini HLS(PJ)	0.81%
	Glosolar Mini HLS(RJ)	0.63%
	Glosolar Mini HLS(TN)	0.37%
	Glosolar Mini HLS(UP)	0.96%
	Jugnu 2 Tubelight(BH)	0.00%
	Jugnu 2 Tubelight(OD)	0.00%
	Jugnu 2 Tubelight(TN)	0.00%
	Jugnu 2 Tubelight(UP)	3.03%
	Jugnu 2 Tubelight(HR)	0.00%
	Jugnu Lightbox L2005(BH)	0.91%
	Jugnu Lightbox L2005(GJ)	0.73%
	Jugnu Lightbox L2005(HR)	0.00%
	Jugnu Lightbox L2005(KA)	0.00%
	Jugnu Lightbox L2005(KL)	0.00%
	Jugnu Lightbox L2005(OD)	0.00%
	Jugnu Lightbox L2005(TN)	0.00%
	Jugnu Lightbox L2005(UP)	2.44%
	Jugnu Lightbox L2005(UK)	0.00%
	Jugnu Lightbox L2005(WB)	0.66%
	Sunking Boom(CG)	0.00%
	Sunking Boom(GOA)	2.38%
	Sunking Boom(JK)	0.00%
	Sunking Boom(KA)	0.32%
	Sunking Boom(KL)	0.93%
	Sunking Boom(MP)	0.00%
	Sunking Boom(MH)	0.00%
	Sunking Boom(TN)	0.00%
	Sunking Boom(WB)	1.92%
Measurement methods and procedures	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" 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	<table border="1"> <thead> <tr> <th>Model</th><th>Value</th></tr> </thead> <tbody> <tr> <td></td><td></td></tr> </tbody> </table>	Model	Value		
Model	Value				

	SKDRDP	
	CL1LT1F1HLS	94.65%
	CL1LT2HLS	97.91%
	CL2HLS	97.41%
	CL2LT2HLS	97.53%
	CL3LT1HLS	96.86%
	CL3LT1HLS2	97.20%
	CLT1HLS	95.92%
	CLT2F1HLS	96.96%
	CLT2HLS	96.56%
	PL1LT3F1HLS	97.49%
	PL1LT3F2HLS	94.91%
	PL1LT5HLS	100.00%
	PL2LT6F1HLS	100.00%
	PL2LT8F2HLS	100.00%
	PLT3F1HLS	95.79%
	PLT4HLS	100.00%
	PLT6HLS	92.54%
	SKDLT3	98.54%
	PL1LT3F1HLS2	95.56%
	CL1LT1HLS	98.24%
	PL1LT3HLS	97.28%
	d.light	
	d.light S500 (BH)	95.95%
	d.light S500 (HR)	96.56%
	d.light S500 (HP)	95.10%
	d.light S500 (KA)	98.15%
	d.light S500 (KL)	97.04%
	d.light S500 (OD)	97.34%
	d.light S500 (PJ)	95.66%
	d.light S500 (RJ)	97.73%
	d.light S500 (UP)	97.69%
	d.light S500 (UK)	100.00%
	Arohan	

	d.light S100 (CG)	93.82%
	d.light S100 (JK)	96.37%
	d.light S100 (OD)	96.36%
	d.light S100 (WB)	97.16%
	d.light S500 (AS)	98.60%
	d.light S500 (BH)	100.00%
	d.light S500 (JK)	100.00%
	d.light S500 (MG)	95.16%
	d.light S500 (OD)	100.00%
	d.light S500 (WB)	97.27%
	d.light S500 (TR)	97.98%
	d.light ST100 (AS)	100.00%
	d.light ST100 (BH)	98.04%
	d.light ST100 (CG)	97.45%
	d.light ST100 (JK)	97.96%
	d.light ST100 (MP)	96.69%
	d.light ST100 (OD)	97.40%
	d.light ST100 (WB)	98.15%
	Samasta	
	d.light D333 (AS)	100.00%
	d.light D333 (CG)	100.00%
	d.light D333 (KA)	100.00%
	d.light D333 (KL)	92.71%
	d.light D333 (OD)	100.00%
	d.light D333 (RJ)	94.85%
	d.light D333 (TN)	100.00%
	d.light D333 (WB)	100.00%
	d.light S550 (AS)	100.00%
	d.light S550 (BH)	100.00%
	d.light S550 (CG)	100.00%
	d.light S550 (KA)	100.00%
	d.light S550 (OD)	97.31%
	d.light S550 (RJ)	95.42%
	d.light S550 (TN)	95.88%

	d.light S550 (WB)	100.00%
	d.light S550 (KL)	100.00%
	Sunking HLS (BH)	96.35%
	Sunking HLS (CG)	100.00%
	Sunking HLS (GOA)	100.00%
	Sunking HLS (GJ)	96.39%
	Sunking HLS (KA)	94.92%
	Sunking HLS (MP)	100.00%
	Sunking HLS (MH)	100.00%
	Sunking HLS (OD)	95.69%
	Sunking HLS (RJ)	96.30%
	Sunking HLS (TN)	94.02%
	Sunking HLS (WB)	100.00%
	Sunking Pro -400 (BH)	98.11%
	Sunking Pro -400 (CG)	100.00%
	Sunking Pro -400 (GOA)	100.00%
	Sunking Pro -400 (GJ)	94.65%
	Sunking Pro -400 (KA)	96.03%
	Sunking Pro -400 (MP)	100.00%
	Sunking Pro -400 (MH)	100.00%
	Sunking Pro -400 (OD)	96.91%
	Sunking Pro -400 (RJ)	97.40%
	Sunking Pro -400 (TN)	96.48%
	Sunking Pro -400 (WB)	94.79%
	Sunking Pro -400 (KL)	100.00%
	d.light S500 (TN)	94.50%
	d.light S500 (OD)	100.00%
	d.light S500 (CG)	100.00%
	Sunking Boom (BH)	96.87%
	Sunking Boom (GJ)	96.87%
	Sunking Boom (KA)	95.47%
	Sunking Boom (RJ)	94.50%
	Sunking Boom (TN)	94.57%
	Sunking Boom (MH)	100.00%

Sunking Boom (OD)	100.00%
Sunking Boom (PD)	100.00%
Sunking Boom (WB)	100.00%
Midland	
d.light S550 (BH)	97.57%
d.light S550 (UP)	97.02%
d.light S550 (JK)	95.32%
Sunking Torch (PJ)	98.49%
Sunking Torch (HR)	100.00%
Sunking Boom (HR)	95.42%
Sunking Boom (PJ)	96.44%
Sunking Boom (RJ)	96.21%
Sunking Boom (UP)	100.00%
Sunking Pro 200 (HR)	95.73%
Sunking Pro 200 (RJ)	98.26%
Sunking Pro 200 (PJ)	100.00%
RAL Duron Mitva MST952A (JK)	98.09%
Arman	
d.light ST100 (MP)	94.63%
d.light ST100 (RJ)	95.21%
d.light ST100 (MH)	100.00%
Sunking Boom (GJ)	98.19%
Sunking Boom (MP)	92.94%
Sunking Boom (MH)	96.91%
Sunking Boom (RJ)	96.80%
GLP India	
Sunking Boom (AP)	100.00%
Sunking Boom (BH)	97.54%
Sunking Boom (CG)	96.09%
Sunking Boom (GJ)	98.08%
Sunking Boom (HR)	100.00%
Sunking Boom KA)	97.66%
Sunking Boom (MP)	97.22%
Sunking Boom (MH)	97.26%

	Sunking Boom (OD)	95.88%
	Sunking Boom (RJ)	98.29%
	Sunking Boom (TN)	97.85%
	Sunking Boom (UP)	100.00%
	Sunking Boom (UK)	95.44%
	Sunking Boom (WB)	100.00%
	Sunking HLS (AP)	100.00%
	Sunking HLS (BH)	100.00%
	Sunking HLS (GJ)	100.00%
	Sunking HLS (KA)	96.38%
	Sunking HLS (MH)	100.00%
	Sunking HLS (OD)	93.93%
	Sunking HLS (TN)	96.94%
	Sunking HLS (WB)	100.00%
	Sunking Pro- 200 (BH)	96.59%
	Sunking Pro- 200 (CG)	98.14%
	Sunking Pro- 200 (HR)	96.88%
	Sunking Pro- 200 (MP)	98.40%
	Sunking Pro- 200 (MH)	97.91%
	Sunking Pro- 200 (OD)	97.53%
	Sunking Pro- 200 (RJ)	97.47%
	Sunking Pro- 200 (UP)	98.24%
	Sunking Pro- 200 (UK)	100.00%
	Sunking Pro- 200 (WB)	100.00%
	Sunking Pro 400 (AP)	93.22%
	Sunking Pro 400 (BH)	95.96%
	Sunking Pro 400 (CG)	94.91%
	Sunking Pro 400 (GJ)	95.27%
	Sunking Pro 400 (KA)	95.87%
	Sunking Pro 400 (MP)	100.00%
	Sunking Pro 400 (MH)	96.53%
	Sunking Pro 400 (OD)	95.76%
	Sunking Pro 400 (RJ)	96.46%
	Sunking Pro 400 (TN)	100.00%

	Sunking Pro 400 (WB)	100.00%
	Sunking pro X plus (BH)	98.84%
	Sunking pro X plus (CG)	96.51%
	Sunking pro X plus (JK)	98.42%
	Sunking pro X plus (KA)	100.00%
	Sunking pro X plus (MP)	96.56%
	Sunking pro X plus (MH)	98.31%
	Sunking pro X plus (OD)	100.00%
	Sunking pro X plus (PJ)	100.00%
	Sunking pro X plus (RJ)	100.00%
	Sunking pro X plus (WB)	98.98%
	Sunking Torch(OD)	94.03%
	Sunking Torch(BH)	100.00%
	Sunking Torch(WB)	100.00%
	ESAF	
	Sunking Pico Plus (BH)	100.00%
	Sunking Pico Plus (CG)	96.97%
	Sunking Pico Plus (JK)	100.00%
	Sunking Pico Plus (KL)	98.43%
	Sunking Pico Plus (MH)	100.00%
	Sunking Pico Plus (TN)	96.39%
	Sunking HLS(BH)	100.00%
	Sunking HLS(JK)	100.00%
	Sunking HLS(KK)	97.35%
	Sunking HLS(TN)	94.63%
	RAL Duron Mitva MS-16C(KL)	98.24%
	Asirvad	
	Glosolar Mini HLS(BH)	97.08%
	Glosolar Mini HLS(CG)	100.00%
	Glosolar Mini HLS(JK)	97.12%
	Glosolar Mini HLS(MP)	98.65%
	Glosolar Mini HLS(OD)	96.78%
	Glosolar Mini HLS(PJ)	97.31%
	Glosolar Mini HLS(RJ)	97.76%

	Glosolar Mini HLS(TN)	98.43%
	Glosolar Mini HLS(UP)	97.06%
	Jugnu 2 Tubelight(BH)	100.00%
	Jugnu 2 Tubelight(OD)	100.00%
	Jugnu 2 Tubelight(TN)	100.00%
	Jugnu 2 Tubelight(UP)	92.93%
	Jugnu 2 Tubelight(HR)	100.00%
	Jugnu Lightbox L2005(BH)	97.17%
	Jugnu Lightbox L2005(GJ)	97.57%
	Jugnu Lightbox L2005(HR)	100.00%
	Jugnu Lightbox L2005(KA)	100.00%
	Jugnu Lightbox L2005(KL)	100.00%
	Jugnu Lightbox L2005(OD)	100.00%
	Jugnu Lightbox L2005(TN)	100.00%
	Jugnu Lightbox L2005(UP)	93.87%
	Jugnu Lightbox L2005(UK)	100.00%
	Jugnu Lightbox L2005(WB)	97.69%
	Sunking Boom(CG)	100.00%
	Sunking Boom(GOA)	94.03%
	Sunking Boom(JK)	100.00%
	Sunking Boom(KA)	98.54%
	Sunking Boom(KL)	96.78%
	Sunking Boom(MP)	100.00%
	Sunking Boom(MH)	100.00%
	Sunking Boom(TN)	100.00%
	Sunking Boom(WB)	94.84%
Measurement methods and procedures	The value is calculated using the recorded value for $LFR_{i,v}$ – $CF_{i,v,LFR} = 1 - (LFR_{i,v} + z * \sqrt{LFR_{i,v} * (1 - LFR_{i,v})})_{ni,v,total}$	
Monitoring frequency	Annual	
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 _{r,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	Model	Value
	<i>SKDRDP</i>	
	CL1LT1F1HLS	29
	CL1LT2HLS	42
	CL2HLS	40
	CL2LT2HLS	42
	CL3LT1HLS	37
	CL3LT1HLS2	38
	CLT1HLS	29
	CLT2F1HLS	40
	CLT2HLS	41
	PL1LT3F1HLS	35
	PL1LT3F2HLS	30
	PL1LT5HLS	16
	PL2LT6F1HLS	23
	PL2LT8F2HLS	8
	PLT3F1HLS	29
	PLT4HLS	27
	PLT6HLS	29
	SKDLT3	42
	PL1LT3F1HLS2	29
	CL1LT1HLS	42
	PL1LT3HLS	29
	<i>d.light</i>	
	d.light S500 (BH)	29
	d.light S500 (HR)	41
	d.light S500 (HP)	30
	d.light S500 (KA)	43
	d.light S500 (KL)	41

	d.light S500 (OD)	42
	d.light S500 (PJ)	41
	d.light S500 (RJ)	42
	d.light S500 (UP)	42
	d.light S500 (UK)	6
	Arohan	
	d.light S100 (CG)	30
	d.light S100 (JK)	38
	d.light S100 (OD)	38
	d.light S100 (WB)	42
	d.light S500 (AS)	43
	d.light S500 (BH)	21
	d.light S500 (JK)	21
	d.light S500 (MG)	39
	d.light S500 (OD)	6
	d.light S500 (WB)	41
	d.light S500 (TR)	40
	d.light ST100 (AS)	2
	d.light ST100 (BH)	42
	d.light ST100 (CG)	40
	d.light ST100 (JK)	42
	d.light ST100 (MP)	39
	d.light ST100 (OD)	42
	d.light ST100 (WB)	43
	Samasta	
	d.light D333 (AS)	20
	d.light D333 (CG)	3
	d.light D333 (KA)	1
	d.light D333 (KL)	29
	d.light D333 (OD)	9
	d.light D333 (RJ)	29
	d.light D333 (TN)	2
	d.light D333 (WB)	4
	d.light S550 (AS)	13

	d.light S550 (BH)	3
	d.light S550 (CG)	1
	d.light S550 (KA)	7
	d.light S550 (OD)	38
	d.light S550 (RJ)	36
	d.light S550 (TN)	29
	d.light S550 (WB)	10
	d.light S550 (KL)	6
	Sunking HLS (BH)	37
	Sunking HLS (CG)	1
	Sunking HLS (GOA)	4
	Sunking HLS (GJ)	30
	Sunking HLS (KA)	29
	Sunking HLS (MP)	3
	Sunking HLS (MH)	19
	Sunking HLS (OD)	29
	Sunking HLS (RJ)	29
	Sunking HLS (TN)	29
	Sunking HLS (WB)	1
	Sunking Pro -400 (BH)	42
	Sunking Pro -400 (CG)	1
	Sunking Pro -400 (GOA)	7
	Sunking Pro -400 (GJ)	29
	Sunking Pro -400 (KA)	29
	Sunking Pro -400 (MP)	6
	Sunking Pro -400 (MH)	30
	Sunking Pro -400 (OD)	38
	Sunking Pro -400 (RJ)	40
	Sunking Pro -400 (TN)	29
	Sunking Pro -400 (WB)	29
	Sunking Pro -400 (KL)	1
	d.light S500 (TN)	29
	d.light S500 (OD)	6
	d.light S500 (CG)	1

	Sunking Boom (BH)	39
	Sunking Boom (GJ)	40
	Sunking Boom (KA)	30
	Sunking Boom (RJ)	29
	Sunking Boom (TN)	29
	Sunking Boom (MH)	3
	Sunking Boom (OD)	6
	Sunking Boom (PD)	3
	Sunking Boom (WB)	11
	Midland	
	d.light S550 (BH)	42
	d.light S550 (UP)	41
	d.light S550 (JK)	30
	Sunking Torch (PJ)	40
	Sunking Torch (HR)	1
	Sunking Boom (HR)	29
	Sunking Boom (PJ)	39
	Sunking Boom (RJ)	40
	Sunking Boom (UP)	5
	Sunking Pro 200 (HR)	29
	Sunking Pro 200 (RJ)	42
	Sunking Pro 200 (PJ)	1
	RAL Duron Mitva MST952A (JK)	42
	Arman	
	d.light ST100 (MP)	30
	d.light ST100 (RJ)	30
	d.light ST100 (MH)	11
	Sunking Boom (GJ)	43
	Sunking Boom (MP)	29
	Sunking Boom (MH)	41
	Sunking Boom (RJ)	39
	GLP India	
	Sunking Boom (AP)	30
	Sunking Boom (BH)	39

	Sunking Boom (CG)	37
	Sunking Boom (GJ)	42
	Sunking Boom (HR)	25
	Sunking Boom KA)	42
	Sunking Boom (MP)	41
	Sunking Boom (MH)	42
	Sunking Boom (OD)	29
	Sunking Boom (RJ)	42
	Sunking Boom (TN)	42
	Sunking Boom (UP)	30
	Sunking Boom (UK)	30
	Sunking Boom (WB)	10
	Sunking HLS (AP)	4
	Sunking HLS (BH)	6
	Sunking HLS (GJ)	1
	Sunking HLS (KA)	29
	Sunking HLS (MH)	30
	Sunking HLS (OD)	30
	Sunking HLS (TN)	41
	Sunking HLS (WB)	4
	Sunking Pro- 200 (BH)	38
	Sunking Pro- 200 (CG)	43
	Sunking Pro- 200 (HR)	38
	Sunking Pro- 200 (MP)	42
	Sunking Pro- 200 (MH)	43
	Sunking Pro- 200 (OD)	29
	Sunking Pro- 200 (RJ)	42
	Sunking Pro- 200 (UP)	43
	Sunking Pro- 200 (UK)	18
	Sunking Pro- 200 (WB)	10
	Sunking Pro 400 (AP)	29
	Sunking Pro 400 (BH)	37
	Sunking Pro 400 (CG)	30
	Sunking Pro 400 (GJ)	29

	Sunking Pro 400 (KA)	39
	Sunking Pro 400 (MP)	10
	Sunking Pro 400 (MH)	40
	Sunking Pro 400 (OD)	28
	Sunking Pro 400 (RJ)	41
	Sunking Pro 400 (TN)	30
	Sunking Pro 400 (WB)	30
	Sunking pro X plus (BH)	43
	Sunking pro X plus (CG)	41
	Sunking pro X plus (JK)	44
	Sunking pro X plus (KA)	1
	Sunking pro X plus (MP)	40
	Sunking pro X plus (MH)	43
	Sunking pro X plus (OD)	1
	Sunking pro X plus (PJ)	2
	Sunking pro X plus (RJ)	3
	Sunking pro X plus (WB)	43
	Sunking Torch(OD)	29
	Sunking Torch(BH)	30
	Sunking Torch(WB)	4
	ESAF	
	Sunking Pico Plus (BH)	4
	Sunking Pico Plus (CG)	29
	Sunking Pico Plus (JK)	2
	Sunking Pico Plus (KL)	42
	Sunking Pico Plus (MH)	1
	Sunking Pico Plus (TN)	29
	Sunking HLS(BH)	5
	Sunking HLS(JK)	2
	Sunking HLS(KK)	42
	Sunking HLS(TN)	30
	RAL Duron Mitva MS-16C(KL)	42
	Asirvad	
	Glosolar Mini HLS(BH)	40

	Glosolar Mini HLS(CG)	2
	Glosolar Mini HLS(JK)	40
	Glosolar Mini HLS(MP)	43
	Glosolar Mini HLS(OD)	40
	Glosolar Mini HLS(PJ)	38
	Glosolar Mini HLS(RJ)	41
	Glosolar Mini HLS(TN)	43
	Glosolar Mini HLS(UP)	40
	Jugnu 2 Tubelight(BH)	11
	Jugnu 2 Tubelight(OD)	10
	Jugnu 2 Tubelight(TN)	18
	Jugnu 2 Tubelight(UP)	30
	Jugnu 2 Tubelight(HR)	10
	Jugnu Lightbox L2005(BH)	41
	Jugnu Lightbox L2005(GJ)	42
	Jugnu Lightbox L2005(HR)	19
	Jugnu Lightbox L2005(KA)	2
	Jugnu Lightbox L2005(KL)	1
	Jugnu Lightbox L2005(OD)	5
	Jugnu Lightbox L2005(TN)	16
	Jugnu Lightbox L2005(UP)	29
	Jugnu Lightbox L2005(UK)	4
	Jugnu Lightbox L2005(WB)	40
	Sunking Boom(CG)	1
	Sunking Boom(GOA)	30
	Sunking Boom(JK)	11
	Sunking Boom(KA)	41
	Sunking Boom(KL)	29
	Sunking Boom(MP)	1
	Sunking Boom(MH)	1
	Sunking Boom(TN)	4
	Sunking Boom(WB)	30
Measurement methods and procedures	The solar lighting systems are monitored based on a survey with sample size calculated in line with the CDM standard for Sampling and surveys for CDM project activities and	

	programme of activities version 9.0 and guideline for 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.
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VPA23: GS11499

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	1. d.light S100 – 65 (Manufacturer’s specification gives lumen output of 65 Lumens which is lesser than the cap of 140.538 and hence 65 is applied to calculate emission reductions) 2. d.light ST100 – 140.538 (Manufacturer’s specification gives lumen output of 220 Lumens which is more than the cap of 140.538 and hence 140.538 is applied to calculate emission reductions) 3. d.light S450 – 140.538 (Manufacturer’s specification gives lumen output of 170 Lumens which is more than the cap of 140.538 and hence 140.538 is applied to calculate emission reductions) 4. d.light S500 - 140.538 (Manufacturer’s specification gives lumen output of 240 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions) 5. Greenlight Planet Boom (Sunking Boom) - 140.538 (Manufacturer’s specification gives lumen output of 160 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions) 6. Greenlight Planet Home Lighting System (Sunking HLS) - 140.538 (Manufacturer’s specification gives lumen output of 400 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions) 7. Greenlight Planet Home 250 (Sunking Home 250) - 140.538 (Manufacturer’s specification gives lumen output of

400 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

8. Greenlight Planet Home 40z (Sunking Home 40Z) - 140.538 (Manufacturer's specification gives lumen output of 250 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

9. Greenlight Planet Pico Plus (Sunking Pico Plus) - 50 (Manufacturer's specification gives lumen output of 50 Lumens which is lesser than the cap of 140.538 and hence 50 is applied to calculate emission reductions)

10. Greenlight Planet Pro 200 (Sunking Pro200)- 140.538 (Manufacturer's specification gives lumen output of 200 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

11. Greenlight Planet Pro 300 (Sunking Pro300)- 140.538 (Manufacturer's specification gives lumen output of 300 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

12. Greenlight Planet Pro 400 (Sunking Pro400)- 140.538 (Manufacturer's specification gives lumen output of 400 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

13. Greenlight Planet Pro Easybuy (Sunking ProEasybuy) - 140.538 (Manufacturer's specification gives lumen output of 175 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

14. Greenlight Planet Pro 2 (Sunking Pro-2) - 140.538 (Manufacturer's specification gives lumen output of 150 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

15. Greenlight Planet Pro X (Sunking Pro-X) - 140.538 (Manufacturer's specification gives lumen output of 175 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

16. Greenlight Planet Torch (Sunking Torch) - 140.538 (Manufacturer's specification gives lumen output of 300 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

17. Jugnu LightBox2005- 140.538 (Manufacturer's specification gives lumen output of 200 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

18. Greenlight Planet Home Lighting System 120 (Sunking HLS120) - 140.538 (Manufacturer's specification gives lumen output of 590 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

19. Glosolar mini HLS- 140.538 (Manufacturer's specification gives lumen output of 400 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

20. CL1LT1F1HLS- 140.538 (Manufacturer's specification gives lumen output of 650 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

21. CL1LT2HLS- 140.538 (Manufacturer's specification gives lumen output of 1100 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

22. CL2HLS- 140.538 (Manufacturer's specification gives lumen output of 400 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

23. CL2LT2HLS- 140.538 (Manufacturer's specification gives lumen output of 1650 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

24. CL3LT1HLS2- 140.538 (Manufacturer's specification gives lumen output of 1050 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

25. CLT1HLS- 140.538 (Manufacturer's specification gives lumen output of 450 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

26. CLT2F1HLS- 140.538 (Manufacturer's specification gives lumen output of 1250 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

27. CLT2HLS- 140.538 (Manufacturer's specification gives lumen output of 400 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

28. PL1LT3F2HLS- 140.538 (Manufacturer's specification gives lumen output of 1250 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

29. PL1LT5HLS- 140.538 (Manufacturer's specification gives lumen output of 1900 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

30. PL2LT6F1HLS- 140.538 (Manufacturer's specification gives lumen output of 4750 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

31. PL2LT8F2HLS- 140.538 (Manufacturer's specification gives lumen output of 6950 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

32. PLT3F1HLS- 140.538 (Manufacturer's specification gives lumen output of 3400 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

33. PLT4F1HLS- 140.538 (Manufacturer's specification gives lumen output of 2150 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)

	34. PL1LT3F1HLS2- 140.538 (Manufacturer's specification gives lumen output of 3750 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions) 35. CL1LT1HLS- 140.538 (Manufacturer's specification gives lumen output of 650 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions) 36. PL1LT4HLS- 140.538 (Manufacturer's specification gives lumen output of 2350 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions) 37. PL2LT4HLS- 140.538 (Manufacturer's specification gives lumen output of 2550 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions) 38. CL2LT2HLS2- 140.538 (Manufacturer's specification gives lumen output of 1650 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions) 39. Greenlight Tubelight (Sunking Tubelight)- 140.538 (Manufacturer's specification gives lumen output of 400 Lumens, however, the lumen value is capped at 140.538 and hence 140.538 is applied to calculate emission reductions)
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	Model	Total Sales
	<i>Arohan</i>	
	d.light S100 (CG)	27
	d light S100 (OD)	34
	d light S100 (WB)	191
	d light S450 (AS)	7
	d light S500 (AS)	1,543
	d light S500 (MG)	7
	d light S500 (TR)	1
	d light S500 (WB)	3
	d light ST 100 (BH)	1,531
	d light ST 100 (CG)	132
	d light ST 100 (JK)	679
	d light ST 100 (MP)	128
	d light ST 100 (OD)	389
	d light ST 100 (WB)	620

	GLP	
	Sunking Boom (BH)	182
	Sunking Boom (CG)	2
	Sunking Boom (JK)	163
	Sunking Boom (KA)	1,137
	Sunking Boom (MP)	272
	Sunking Boom (PD)	114
	Sunking Boom (RJ)	4
	Sunking Boom (TN)	2,501
	Sunking Boom (TL)	18
	Sunking Boom (UP)	234
	Sunking Boom (WB)	9
	Sunking HLS (BH)	3
	Sunking HLS (JK)	18
	Sunking HLS (UP)	1
	Sunking HLS (KA)	24
	Sunking HLS 120 (KA)	1
	Sunking Home 250 (KA)	1
	Sunking Home 250 (UP)	2
	Sunking Home 40 Z (BH)	66
	Sunking Home 40 Z (KA)	5
	Sunking Home 40 Z (TL)	5
	Sunking Home 40 Z (UP)	23
	Sunking pico plus (TL)	4
	Sunking pico plus (KA)	1
	Sunking pico plus (UP)	17
	Sunking Pro- 200 (AP)	1
	Sunking Pro- 200 (KA)	1
	Sunking Pro- 200 (MP)	124
	Sunking Pro- 200 (TL)	31
	Sunking Pro- 200 (UP)	35
	Sunking Pro- 200 (WB)	8
	Sunking Pro 300 (AS)	1
	Sunking Pro 300 (KA)	1,680

	Sunking Pro 300 (TL)	50
	Sunking Pro 300 (UP)	53
	Sunking Pro 300 (WB)	16
	Sunking Pro 400 (BH)	3,198
	Sunking Pro 400 (JK)	1,134
	Sunking Pro 400 (KA)	326
	Sunking Pro 400 (MP)	39
	Sunking Pro 400 (TL)	147
	Sunking Pro 400 (UP)	278
	Sunking Pro 400 (WB)	106
	Sunking Pro Easybuy (KA)	745
	Sunking Pro Easybuy (UP)	4
	Sunking Pro Easybuy (WB)	22
	Sunking Pro-2 (AS)	4
	Sunking Pro-2 (KA)	7
	Sunking Pro-2 (TL)	4
	Sunking Pro-X (BH)	6
	Sunking Pro-X (JK)	7
	Sunking Pro-X (KA)	8
	Sunking Torch (CG)	6
	Sunking Torch (KA)	2
	Sunking Torch (OD)	2
	Sunking Torch (PJ)	56
	Sunking Torch (RJ)	8
	Sunking Torch (UP)	1
	Sunking Torch (WB)	2
	Sunking Tubelight (KA)	4
	Asirvad	
	Jugnu LightBox2005 (BH)	7
	Jugnu LightBox2005 (UP)	3
	Jugnu LightBox2005 (WB)	39
	Sunking Boom (KA)	803
	Sunking Pro-X (KA)	6
	GloSolar Mini HLS (CG)	2

	GloSolar Mini HLS (MP)	5,988
	GloSolar Mini HLS (JK)	115
	GloSolar Mini HLS (OD)	201
	GloSolar Mini HLS (PJ)	1,923
	GloSolar Mini HLS (RJ)	22
	GloSolar Mini HLS (TN)	1,599
	GloSolar Mini HLS (UP)	50
	SKDRDP	
	CL1LT1F1HLS	98
	CL1LT1HLS	2,590
	CL1LT2HLS	5,610
	CL2HLS	684
	CL2LT2HLS	233
	CL2LT2HLS2	3,618
	CL3LT1HLS2	246
	CLT1HLS	132
	CLT2F1HLS	298
	CLT2HLS	552
	PL1LT3F1HLS2	69
	PL1LT3F2HLS	50
	PL1LT4HLS	243
	PL1LT5HLS	24
	PL2LT4HLS	195
	PL2LT6F1HLS	12
	PL2LT8F2HLS	7
	PLT3F1HLS	184
	PLT4F1HLS	206
	TOTAL	44,023
Measurement methods and procedures	N.A.	
Monitoring frequency	Annual	
QA/QC procedures	Each light installation is geocoded (GPS coordinates or other specific location identifiers) in the MEC Tracker System. Associated data will reside in the MEC Tracker Database,	

	allowing each installation to be monitored on a regular basis. The data in MEC tracker system can be crosschecked with the MIS system of the PO.
Purpose of data	Calculation of baseline emissions
Additional comment	4 model for Arohan, 4 model for Asirvad, 14 models for GLP and 19 models of SKDRDP are distributed under this VPA

Data / Parameter	$d_{i,a,v}$																																																
Unit	Days																																																
Description	Average number of days lamps of type i that have been deployed in period a were operating in period v																																																
Source of data	Monitoring partner, Credit Tracker																																																
Value(s) applied	<table> <tr> <th>Model</th><th>Values</th></tr> <tr> <td>Arohan</td><td></td></tr> <tr> <td>d.light S100 (OD)</td><td>354</td></tr> <tr> <td>d light S100 (CG)</td><td>351</td></tr> <tr> <td>d light S100 (WB)</td><td>348</td></tr> <tr> <td>d light S500 (AS)</td><td>357</td></tr> <tr> <td>d light S500 (MG)</td><td>365</td></tr> <tr> <td>d light S500 (TR)</td><td>365</td></tr> <tr> <td>d light S500 (WB)</td><td>365</td></tr> <tr> <td>d light S450 (AS)</td><td>365</td></tr> <tr> <td>d light ST 100 (BH)</td><td>357</td></tr> <tr> <td>d light ST 100 (CG)</td><td>354</td></tr> <tr> <td>d light ST 100 (JK)</td><td>360</td></tr> <tr> <td>d light ST 100 (OD)</td><td>356</td></tr> <tr> <td>d light ST 100 (MP)</td><td>354</td></tr> <tr> <td>d light ST 100 (WB)</td><td>356</td></tr> <tr> <td>GLP</td><td></td></tr> <tr> <td>Sunking Boom (BH)</td><td>353</td></tr> <tr> <td>Sunking Boom (CG)</td><td>365</td></tr> <tr> <td>Sunking Boom (JK)</td><td>352</td></tr> <tr> <td>Sunking Boom (KA)</td><td>358</td></tr> <tr> <td>Sunking Boom (MP)</td><td>354</td></tr> <tr> <td>Sunking Boom (PD)</td><td>359</td></tr> <tr> <td>Sunking Boom (RJ)</td><td>365</td></tr> </table>	Model	Values	Arohan		d.light S100 (OD)	354	d light S100 (CG)	351	d light S100 (WB)	348	d light S500 (AS)	357	d light S500 (MG)	365	d light S500 (TR)	365	d light S500 (WB)	365	d light S450 (AS)	365	d light ST 100 (BH)	357	d light ST 100 (CG)	354	d light ST 100 (JK)	360	d light ST 100 (OD)	356	d light ST 100 (MP)	354	d light ST 100 (WB)	356	GLP		Sunking Boom (BH)	353	Sunking Boom (CG)	365	Sunking Boom (JK)	352	Sunking Boom (KA)	358	Sunking Boom (MP)	354	Sunking Boom (PD)	359	Sunking Boom (RJ)	365
Model	Values																																																
Arohan																																																	
d.light S100 (OD)	354																																																
d light S100 (CG)	351																																																
d light S100 (WB)	348																																																
d light S500 (AS)	357																																																
d light S500 (MG)	365																																																
d light S500 (TR)	365																																																
d light S500 (WB)	365																																																
d light S450 (AS)	365																																																
d light ST 100 (BH)	357																																																
d light ST 100 (CG)	354																																																
d light ST 100 (JK)	360																																																
d light ST 100 (OD)	356																																																
d light ST 100 (MP)	354																																																
d light ST 100 (WB)	356																																																
GLP																																																	
Sunking Boom (BH)	353																																																
Sunking Boom (CG)	365																																																
Sunking Boom (JK)	352																																																
Sunking Boom (KA)	358																																																
Sunking Boom (MP)	354																																																
Sunking Boom (PD)	359																																																
Sunking Boom (RJ)	365																																																

	Sunking Boom (TN)	362
	Sunking Boom (TL)	345
	Sunking Boom (UP)	353
	Sunking Boom (WB)	365
	Sunking HLS (BH)	365
	Sunking HLS (JK)	345
	Sunking HLS (UP)	365
	Sunking HLS (KA)	350
	Sunking HLS 120 (KA)	365
	Sunking Home 250 (UP)	365
	Sunking Home 250 (KA)	365
	Sunking Home 40 Z (BH)	359
	Sunking Home 40 Z (KA)	365
	Sunking Home 40 Z (TL)	365
	Sunking Home 40 Z (UP)	349
	Sunking pico plus (UP)	344
	Sunking pico plus (KA)	365
	Sunking pico plus (TL)	365
	Sunking Pro- 200 (KA)	365
	Sunking Pro- 200 (MP)	350
	Sunking Pro- 200 (TL)	341
	Sunking Pro- 200 (UP)	355
	Sunking Pro- 200 (WB)	365
	Sunking Pro 300 (AS)	365
	Sunking Pro 300 (KA)	360
	Sunking Pro 300 (TL)	326
	Sunking Pro 300 (UP)	351
	Sunking Pro 300 (WB)	342
	Sunking Pro 400 (BH)	362
	Sunking Pro 400 (KA)	361
	Sunking Pro 400 (JK)	361
	Sunking Pro 400 (MP)	356
	Sunking Pro 400 (TL)	355
	Sunking Pro 400 (UP)	349

	Sunking Pro 400 (WB)	355
	Sunking Pro Easybuy (KA)	358
	Sunking Pro Easybuy (UP)	365
	Sunking Pro Easybuy (WB)	348
	Sunking Pro-2 (AS)	365
	Sunking Pro-2 (TL)	365
	Sunking Pro-2 (KA)	365
	Sunking Pro-X (BH)	365
	Sunking Pro-X (JK)	365
	Sunking Pro-X (KA)	365
	Sunking Torch (CG)	365
	Sunking Torch (KA)	365
	Sunking Torch (OD)	365
	Sunking Torch (PJ)	352
	Sunking Torch (RJ)	365
	Sunking Torch (UP)	365
	Sunking Torch (WB)	365
	Sunking Tubelight (KA)	365
	Asirvad	
	Jugnu LightBox2005 (BH)	365
	Jugnu LightBox2005 (UP)	365
	Jugnu LightBox2005 (WB)	356
	Sunking Boom (KA)	361
	Sunking Pro-X (KA)	365
	GloSolar Mini HLS (CG)	365
	GloSolar Mini HLS (MP)	364
	GloSolar Mini HLS (JK)	359
	GloSolar Mini HLS (OD)	361
	GloSolar Mini HLS (PJ)	363
	GloSolar Mini HLS (RJ)	348
	GloSolar Mini HLS (TN)	362
	GloSolar Mini HLS (UP)	358
	SKDRDP	
	CL1LT1F1HLS	361

	CL1LT1HLS	364
	CL1LT2HLS	364
	CL2HLS	362
	CL2LT2HLS	360
	CL2LT2HLS2	364
	CL3LT1HLS2	359
	CLT1HLS	354
	CLT2F1HLS	358
	CLT2HLS	362
	PL1LT3F1HLS2	349
	PL1LT3F2HLS	350
	PL1LT4HLS	359
	PL1LT5HLS	350
	PL2LT4HLS	363
	PL2LT6F1HLS	335
	PL2LT8F2HLS	365
	PLT3F1HLS	359
	PLT4F1HLS	358
Measurement methods and procedures	Exact date of sale (in the case of solar lights) and installation (in the case of solar home systems) for all clean energy 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 frequency	Annual	
QA/QC procedures	The data in MEC tracker system can be cross checked with the MIS system of the PO – GLP, Asirvad, Arohan, SKDRDP.	
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	H
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 type <i>i</i> in checked sample group g _{i,v} not operational in period <i>v</i>	
Source of data	Monitoring partner, Credit Tracker	
Value(s) applied	Model	Values
	<i>Arohan</i>	
	d.light S100 (OD)	2.94%
	d light S100 (CG)	3.70%
	d light S100 (WB)	4.71%
	d light S500 (AS)	2.27%
	d light S500 (MG)	0.00%
	d light S500 (TR)	0.00%
	d light S500 (WB)	0.00%
	d light S450 (AS)	0.00%
	d light ST 100 (BH)	2.22%
	d light ST 100 (CG)	3.03%
	d light ST 100 (JK)	1.33%
	d light ST 100 (OD)	2.57%
	d light ST 100 (MP)	3.13%
	d light ST 100 (WB)	2.58%
	<i>GLP</i>	
	Sunking Boom (BH)	3.30%
	Sunking Boom (CG)	0.00%
	Sunking Boom (JK)	3.68%

	Sunking Boom (KA)	1.93%
	Sunking Boom (MP)	2.94%
	Sunking Boom (PD)	1.75%
	Sunking Boom (RJ)	0.00%
	Sunking Boom (TN)	0.76%
	Sunking Boom (TL)	5.56%
	Sunking Boom (UP)	3.42%
	Sunking Boom (WB)	0.00%
	Sunking HLS (BH)	0.00%
	Sunking HLS (JK)	5.56%
	Sunking HLS (UP)	0.00%
	Sunking HLS (KA)	4.17%
	Sunking HLS 120 (KA)	0.00%
	Sunking Home 250 (UP)	0.00%
	Sunking Home 250 (KA)	0.00%
	Sunking Home 40 Z (BH)	1.52%
	Sunking Home 40 Z (KA)	0.00%
	Sunking Home 40 Z (TL)	0.00%
	Sunking Home 40 Z (UP)	4.35%
	Sunking pico plus (UP)	5.88%
	Sunking pico plus (KA)	0.00%
	Sunking pico plus (TL)	0.00%
	Sunking Pro- 200 (KA)	0.00%
	Sunking Pro- 200 (MP)	4.03%
	Sunking Pro- 200 (TL)	6.45%
	Sunking Pro- 200 (UP)	2.86%
	Sunking Pro- 200 (WB)	0.00%
	Sunking Pro 300 (AS)	0.00%
	Sunking Pro 300 (KA)	1.49%
	Sunking Pro 300 (TL)	4.00%
	Sunking Pro 300 (UP)	3.77%
	Sunking Pro 300 (WB)	6.25%
	Sunking Pro 400 (BH)	0.84%
	Sunking Pro 400 (KA)	1.23%

	Sunking Pro 400 (JK)	1.15%
	Sunking Pro 400 (MP)	2.56%
	Sunking Pro 400 (TL)	2.72%
	Sunking Pro 400 (UP)	4.32%
	Sunking Pro 400 (WB)	2.83%
	Sunking Pro Easybuy (KA)	1.88%
	Sunking Pro Easybuy (UP)	0.00%
	Sunking Pro Easybuy (WB)	4.55%
	Sunking Pro-2 (AS)	0.00%
	Sunking Pro-2 (TL)	0.00%
	Sunking Pro-2 (KA)	0.00%
	Sunking Pro-X (BH)	0.00%
	Sunking Pro-X (JK)	0.00%
	Sunking Pro-X (KA)	0.00%
	Sunking Torch (CG)	0.00%
	Sunking Torch (KA)	0.00%
	Sunking Torch (OD)	0.00%
	Sunking Torch (PJ)	3.57%
	Sunking Torch (RJ)	0.00%
	Sunking Torch (UP)	0.00%
	Sunking Torch (WB)	0.00%
	Sunking Tubelight (KA)	0.00%
	Asirvad	
	Jugnu LightBox2005 (BH)	0.00%
	Jugnu LightBox2005 (UP)	0.00%
	Jugnu LightBox2005 (WB)	2.56%
	Sunking Boom (KA)	1.00%
	Sunking Pro-X (KA)	0.00%
	GloSolar Mini HLS (CG)	0.00%
	GloSolar Mini HLS (MP)	0.18%
	GloSolar Mini HLS (JK)	1.74%
	GloSolar Mini HLS (OD)	1.00%
	GloSolar Mini HLS (PJ)	0.57%
	GloSolar Mini HLS (RJ)	4.55%

	GloSolar Mini HLS (TN)	0.69%
	GloSolar Mini HLS (UP)	2.00%
	SKDRDP	
	CL1LT1F1HLS	1.02%
	CL1LT1HLS	0.35%
	CL1LT2HLS	0.14%
	CL2HLS	0.73%
	CL2LT2HLS	1.29%
	CL2LT2HLS2	0.30%
	CL3LT1HLS2	1.63%
	CLT1HLS	3.03%
	CLT2F1HLS	2.01%
	CLT2HLS	0.91%
	PL1LT3F1HLS2	4.35%
	PL1LT3F2HLS	4.00%
	PL1LT4HLS	1.65%
	PL1LT5HLS	4.17%
	PL2LT4HLS	0.51%
	PL2LT6F1HLS	8.33%
	PL2LT8F2HLS	0.00%
	PLT3F1HLS	1.63%
	PLT4F1HLS	1.94%
Measurement methods and procedures	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” 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	<table border="1"> <thead> <tr> <th>Model</th><th>Values</th></tr> </thead> <tbody> <tr> <td>Arohan</td><td></td></tr> <tr> <td>d.light S100 (OD)</td><td>93.08%</td></tr> <tr> <td>d light S100 (CG)</td><td>91.61%</td></tr> <tr> <td>d light S100 (WB)</td><td>90.79%</td></tr> <tr> <td>d light S500 (AS)</td><td>94.84%</td></tr> <tr> <td>d light S500 (MG)</td><td>100.00%</td></tr> <tr> <td>d light S500 (TR)</td><td>100.00%</td></tr> <tr> <td>d light S500 (WB)</td><td>100.00%</td></tr> </tbody> </table>	Model	Values	Arohan		d.light S100 (OD)	93.08%	d light S100 (CG)	91.61%	d light S100 (WB)	90.79%	d light S500 (AS)	94.84%	d light S500 (MG)	100.00%	d light S500 (TR)	100.00%	d light S500 (WB)	100.00%
Model	Values																		
Arohan																			
d.light S100 (OD)	93.08%																		
d light S100 (CG)	91.61%																		
d light S100 (WB)	90.79%																		
d light S500 (AS)	94.84%																		
d light S500 (MG)	100.00%																		
d light S500 (TR)	100.00%																		
d light S500 (WB)	100.00%																		

	d light S450 (AS)	100.00%
	d light ST 100 (BH)	94.91%
	d light ST 100 (CG)	93.18%
	d light ST 100 (JK)	96.42%
	d light ST 100 (OD)	94.28%
	d light ST 100 (MP)	93.03%
	d light ST 100 (WB)	94.26%
	GLP	
	Sunking Boom (BH)	92.92%
	Sunking Boom (CG)	100.00%
	Sunking Boom (JK)	92.27%
	Sunking Boom (KA)	94.77%
	Sunking Boom (MP)	93.61%
	Sunking Boom (PD)	95.34%
	Sunking Boom (RJ)	100.00%
	Sunking Boom (TN)	97.59%
	Sunking Boom (TL)	87.48%
	Sunking Boom (UP)	92.87%
	Sunking Boom (WB)	100.00%
	Sunking HLS (BH)	100.00%
	Sunking HLS (JK)	87.48%
	Sunking HLS (UP)	100.00%
	Sunking HLS (KA)	90.57%
	Sunking HLS 120 (KA)	100.00%
	Sunking Home 250 (UP)	100.00%
	Sunking Home 250 (KA)	100.00%
	Sunking Home 40 Z (BH)	95.70%
	Sunking Home 40 Z (KA)	100.00%
	Sunking Home 40 Z (TL)	100.00%
	Sunking Home 40 Z (UP)	90.17%
	Sunking pico plus (UP)	86.76%
	Sunking pico plus (KA)	100.00%
	Sunking pico plus (TL)	100.00%
	Sunking Pro- 200 (KA)	100.00%

	Sunking Pro- 200 (MP)	91.68%
	Sunking Pro- 200 (TL)	87.76%
	Sunking Pro- 200 (UP)	93.22%
	Sunking Pro- 200 (WB)	100.00%
	Sunking Pro 300 (AS)	100.00%
	Sunking Pro 300 (KA)	96.18%
	Sunking Pro 300 (TL)	91.38%
	Sunking Pro 300 (UP)	91.74%
	Sunking Pro 300 (WB)	85.94%
	Sunking Pro 400 (BH)	97.40%
	Sunking Pro 400 (KA)	96.58%
	Sunking Pro 400 (JK)	96.81%
	Sunking Pro 400 (MP)	93.71%
	Sunking Pro 400 (TL)	93.78%
	Sunking Pro 400 (UP)	91.54%
	Sunking Pro 400 (WB)	93.45%
	Sunking Pro Easybuy (KA)	95.48%
	Sunking Pro Easybuy (UP)	100.00%
	Sunking Pro Easybuy (WB)	89.73%
	Sunking Pro-2 (AS)	100.00%
	Sunking Pro-2 (TL)	100.00%
	Sunking Pro-2 (KA)	100.00%
	Sunking Pro-X (BH)	100.00%
	Sunking Pro-X (JK)	100.00%
	Sunking Pro-X (KA)	100.00%
	Sunking Torch (CG)	100.00%
	Sunking Torch (KA)	100.00%
	Sunking Torch (OD)	100.00%
	Sunking Torch (PJ)	92.06%
	Sunking Torch (RJ)	100.00%
	Sunking Torch (UP)	100.00%
	Sunking Torch (WB)	100.00%
	Sunking Tubelight (KA)	100.00%
	Asirvad	

	Jugnu LightBox2005 (BH)	100.00%
	Jugnu LightBox2005 (UP)	100.00%
	Jugnu LightBox2005 (WB)	93.71%
	Sunking Boom (KA)	97.07%
	Sunking Pro-X (KA)	100.00%
	GloSolar Mini HLS (CG)	100.00%
	GloSolar Mini HLS (MP)	98.79%
	GloSolar Mini HLS (JK)	95.37%
	GloSolar Mini HLS (OD)	96.95%
	GloSolar Mini HLS (PJ)	97.99%
	GloSolar Mini HLS (RJ)	89.73%
	GloSolar Mini HLS (TN)	97.72%
	GloSolar Mini HLS (UP)	94.70%
	SKDRDP	
	CL1LT1F1HLS	96.69%
	CL1LT1HLS	98.55%
	CL1LT2HLS	99.15%
	CL2HLS	97.63%
	CL2LT2HLS	96.41%
	CL2LT2HLS2	98.63%
	CL3LT1HLS2	95.79%
	CLT1HLS	93.23%
	CLT2F1HLS	95.16%
	CLT2HLS	97.25%
	PL1LT3F1HLS2	90.85%
	PL1LT3F2HLS	91.38%
	PL1LT4HLS	95.76%
	PL1LT5HLS	90.57%
	PL2LT4HLS	98.01%
	PL2LT6F1HLS	81.37%
	PL2LT8F2HLS	100.00%
	PLT3F1HLS	95.72%
	PLT4F1HLS	95.21%

Measurement methods and procedures	The value is calculated using the recorded value for $LFR_{i,v}$ – $CF_{i,v,LFR} = 1 - (LFR_{i,v} + z * \sqrt{LFR_{i,v} * (1 - LFR_{i,v})}) / n_{i,v,total}$
Monitoring frequency	Annual
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 which a valid result was obtained.																																								
Source of data	Monitoring partner, Credit Tracker																																								
Value(s) applied	<table> <tr> <th>Model</th><th>Values</th></tr> <tr> <td>Arohan</td><td></td></tr> <tr> <td>d.light S100 (OD)</td><td>30</td></tr> <tr> <td>d light S100 (CG)</td><td>27</td></tr> <tr> <td>d light S100 (WB)</td><td>37</td></tr> <tr> <td>d light S500 (AS)</td><td>44</td></tr> <tr> <td>d light S500 (MG)</td><td>7</td></tr> <tr> <td>d light S500 (TR)</td><td>1</td></tr> <tr> <td>d light S500 (WB)</td><td>3</td></tr> <tr> <td>d light S450 (AS)</td><td>7</td></tr> <tr> <td>d light ST 100 (BH)</td><td>44</td></tr> <tr> <td>d light ST 100 (CG)</td><td>34</td></tr> <tr> <td>d light ST 100 (JK)</td><td>43</td></tr> <tr> <td>d light ST 100 (OD)</td><td>42</td></tr> <tr> <td>d light ST 100 (MP)</td><td>34</td></tr> <tr> <td>d light ST 100 (WB)</td><td>42</td></tr> <tr> <td>GLP</td><td></td></tr> <tr> <td>Sunking Boom (BH)</td><td>37</td></tr> <tr> <td>Sunking Boom (CG)</td><td>2</td></tr> <tr> <td>Sunking Boom (JK)</td><td>36</td></tr> </table>	Model	Values	Arohan		d.light S100 (OD)	30	d light S100 (CG)	27	d light S100 (WB)	37	d light S500 (AS)	44	d light S500 (MG)	7	d light S500 (TR)	1	d light S500 (WB)	3	d light S450 (AS)	7	d light ST 100 (BH)	44	d light ST 100 (CG)	34	d light ST 100 (JK)	43	d light ST 100 (OD)	42	d light ST 100 (MP)	34	d light ST 100 (WB)	42	GLP		Sunking Boom (BH)	37	Sunking Boom (CG)	2	Sunking Boom (JK)	36
Model	Values																																								
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d.light S100 (OD)	30																																								
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Sunking Boom (BH)	37																																								
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Sunking Boom (JK)	36																																								

	Sunking Boom (KA)	29
	Sunking Boom (MP)	40
	Sunking Boom (PD)	34
	Sunking Boom (RJ)	4
	Sunking Boom (TN)	46
	Sunking Boom (TL)	18
	Sunking Boom (UP)	40
	Sunking Boom (WB)	9
	Sunking HLS (BH)	3
	Sunking HLS (JK)	18
	Sunking HLS (UP)	1
	Sunking HLS (KA)	24
	Sunking HLS 120 (KA)	1
	Sunking Home 250 (UP)	2
	Sunking Home 250 (KA)	1
	Sunking Home 40 Z (BH)	32
	Sunking Home 40 Z (KA)	5
	Sunking Home 40 Z (TL)	5
	Sunking Home 40 Z (UP)	23
	Sunking pico plus (UP)	17
	Sunking pico plus (KA)	1
	Sunking pico plus (TL)	4
	Sunking Pro- 200 (KA)	1
	Sunking Pro- 200 (MP)	35
	Sunking Pro- 200 (TL)	30
	Sunking Pro- 200 (UP)	30
	Sunking Pro- 200 (WB)	8
	Sunking Pro 300 (AS)	1
	Sunking Pro 300 (KA)	45
	Sunking Pro 300 (TL)	30
	Sunking Pro 300 (UP)	30
	Sunking Pro 300 (WB)	16
	Sunking Pro 400 (BH)	45
	Sunking Pro 400 (KA)	42

	Sunking Pro 400 (JK)	45
	Sunking Pro 400 (MP)	30
	Sunking Pro 400 (TL)	36
	Sunking Pro 400 (UP)	40
	Sunking Pro 400 (WB)	33
	Sunking Pro Easybuy (KA)	44
	Sunking Pro Easybuy (UP)	4
	Sunking Pro Easybuy (WB)	22
	Sunking Pro-2 (AS)	4
	Sunking Pro-2 (TL)	4
	Sunking Pro-2 (KA)	7
	Sunking Pro-X (BH)	6
	Sunking Pro-X (JK)	7
	Sunking Pro-X (KA)	8
	Sunking Torch (CG)	6
	Sunking Torch (KA)	2
	Sunking Torch (OD)	2
	Sunking Torch (PJ)	30
	Sunking Torch (RJ)	8
	Sunking Torch (UP)	1
	Sunking Torch (WB)	2
	Sunking Tubelight (KA)	4
	Asirvad	
	Jugnu LightBox2005 (BH)	7
	Jugnu LightBox2005 (UP)	3
	Jugnu LightBox2005 (WB)	30
	Sunking Boom (KA)	44
	Sunking Pro-X (KA)	6
	GloSolar Mini HLS (CG)	2
	GloSolar Mini HLS (MP)	29
	GloSolar Mini HLS (JK)	34
	GloSolar Mini HLS (OD)	39
	GloSolar Mini HLS (PJ)	46
	GloSolar Mini HLS (RJ)	22

	GloSolar Mini HLS (TN)	45
	GloSolar Mini HLS (UP)	30
	SKDRDP	
	CL1LT1F1HLS	32
	CL1LT1HLS	47
	CL1LT2HLS	47
	CL2HLS	45
	CL2LT2HLS	40
	CL2LT2HLS2	44
	CL3LT1HLS2	40
	CLT1HLS	35
	CLT2F1HLS	41
	CLT2HLS	44
	PL1LT3F1HLS2	30
	PL1LT3F2HLS	30
	PL1LT4HLS	40
	PL1LT5HLS	24
	PL2LT4HLS	39
	PL2LT6F1HLS	12
	PL2LT8F2HLS	7
	PLT3F1HLS	38
	PLT4F1HLS	39
Measurement methods and procedures	The solar lighting systems are monitored based on a survey with sample size calculated in line with the CDM standard for Sampling and surveys for CDM project activities and programme of activities version 9.0 and guideline for 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.
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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.

VPA33: GS11490

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	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)
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	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) 13. 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) 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}
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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		Installations
	Models	
	Midland	
	d.light S550(BH)	5,099
	d.light S550(UP)	818
	Sunking Boom(HR)	599
	Sunking Boom(PJ)	3,538
	Sunking Boom(RJ)	1,723
	Sunking Pro200(HR)	151
	Sunking Pro200(RJ)	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
	Jugnu Lightbox L2005(WB)	3,449
	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 methods and procedures	N.A.	
Monitoring frequency	Annual	
QA/QC procedures	Each light installation is geocoded (GPS coordinates or other specific location identifiers) in the MEC Tracker System. Associated data will reside in the MEC Tracker Database, allowing each installation to be monitored on a regular basis. The data in MEC tracker system can be crosschecked 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 for GLP are distributed under this VPA	

Data / Parameter	d _{i,a,v}																																																											
Unit	Days																																																											
Description	Average number of days lamps of type i that have been deployed in period a were operating in period v																																																											
Source of data	Monitoring partner, Credit Tracker																																																											
Value(s) applied	<table><tr><th>Models</th><th>days</th></tr><tr><td>Midland</td><td>361</td></tr><tr><td>d.light S550(BH)</td><td>360</td></tr><tr><td>d.light S550(UP)</td><td>360</td></tr><tr><td>Sunking Boom(HR)</td><td>361</td></tr><tr><td>Sunking Boom(PJ)</td><td>360</td></tr><tr><td>Sunking Boom(RJ)</td><td>358</td></tr><tr><td>Sunking Pro200(HR)</td><td>363</td></tr><tr><td>Sunking Pro200(RJ)</td><td>361</td></tr><tr><td>Satin</td><td></td></tr><tr><td>Jugnu TWP29004(JK)</td><td>365</td></tr><tr><td>Jugnu TWP29004(OD)</td><td>362</td></tr><tr><td>Jugnu TWP29006(BH)</td><td>360</td></tr><tr><td>Jugnu TWP29006(OD)</td><td>360</td></tr><tr><td>Jugnu TWP29006(WB)</td><td>362</td></tr><tr><td>Jugnu TWP29008(OD)</td><td>357</td></tr><tr><td>Sunking Pico(RJ)</td><td>365</td></tr><tr><td>d.light D333(AS)</td><td>361</td></tr><tr><td>d.light D333(BH)</td><td>359</td></tr><tr><td>d.light D333(JK)</td><td>349</td></tr><tr><td>d.light D333(MG)</td><td>353</td></tr><tr><td>d.light D333(TR)</td><td>355</td></tr><tr><td>d.light D333(UP)</td><td>359</td></tr><tr><td>d.light S500(AS)</td><td>365</td></tr><tr><td>d.light S500(UP)</td><td>355</td></tr><tr><td>d.light S500(UK)</td><td>365</td></tr><tr><td>d.light S550(AS)</td><td>361</td></tr><tr><td>d.light S550(BH)</td><td>360</td></tr><tr><td>d.light S550(MG)</td><td>360</td></tr></table>		Models	days	Midland	361	d.light S550(BH)	360	d.light S550(UP)	360	Sunking Boom(HR)	361	Sunking Boom(PJ)	360	Sunking Boom(RJ)	358	Sunking Pro200(HR)	363	Sunking Pro200(RJ)	361	Satin		Jugnu TWP29004(JK)	365	Jugnu TWP29004(OD)	362	Jugnu TWP29006(BH)	360	Jugnu TWP29006(OD)	360	Jugnu TWP29006(WB)	362	Jugnu TWP29008(OD)	357	Sunking Pico(RJ)	365	d.light D333(AS)	361	d.light D333(BH)	359	d.light D333(JK)	349	d.light D333(MG)	353	d.light D333(TR)	355	d.light D333(UP)	359	d.light S500(AS)	365	d.light S500(UP)	355	d.light S500(UK)	365	d.light S550(AS)	361	d.light S550(BH)	360	d.light S550(MG)	360
Models	days																																																											
Midland	361																																																											
d.light S550(BH)	360																																																											
d.light S550(UP)	360																																																											
Sunking Boom(HR)	361																																																											
Sunking Boom(PJ)	360																																																											
Sunking Boom(RJ)	358																																																											
Sunking Pro200(HR)	363																																																											
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Jugnu TWP29004(JK)	365																																																											
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d.light S550(MG)	360																																																											

	d.light S550(TR)	365
	d.light S550(UP)	361
	Jugnu 2 Tubelight(CG)	365
	Jugnu lightbox L1406(OD)	360
	Jugnu Lightbox L2005(BH)	361
	Jugnu Lightbox L2005(CG)	365
	Jugnu Lightbox L2005(WB)	361
	Sunking Boom(HR)	360
	Sunking Boom(J&K)	365
	Sunking Boom(PJ)	360
	Sunking Boom(RJ)	360
	Sunking Pro- 200(RJ)	365
	GLP INDIA	
	Sunking Home 40Z(BH)	360
	Sunking Home 40Z(KA)	365
	Sunking Pro X plus(BH)	364
	Sunking Pro X plus(CG)	360
	Sunking Pro X plus(JK)	362
	Sunking Pro X plus(MP)	361
	Sunking Pro X plus(MH)	362
	Sunking Pro X plus(OD)	362
	Sunking Pro X plus(WB)	363
Measurement methods and procedures	Exact date of sale (in the case of solar lights) and installation (in the case of solar home systems) for all clean energy 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 frequency	Annual	
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	H
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 type <i>i</i> in checked sample group gi,v not operational in period <i>v</i>	
Source of data	Monitoring partner, Credit Tracker	
Value(s) applied	Models	Value, %
	<i>Midland</i>	
	d.light S550(BH)	0.98%
	d.light S550(UP)	1.34%
	Sunking Boom(HR)	1.50%
	Sunking Boom(PJ)	0.99%
	Sunking Boom(RJ)	1.28%
	Sunking Pro200(HR)	1.99%
	Sunking Pro200(RJ)	1.05%
	<i>Satin</i>	0.00%
	Jugnu TWP29004(JK)	0.00%
	Jugnu TWP29004(OD)	0.91%
	Jugnu TWP29006(BH)	1.44%
	Jugnu TWP29006(OD)	1.25%
	Jugnu TWP29006(WB)	1.32%
	Jugnu TWP29008(OD)	2.10%

	Sunking Pico(RJ)	0.00%
	d.light D333(AS)	1.17%
	d.light D333(BH)	1.72%
	d.light D333(JK)	4.29%
	d.light D333(MG)	3.23%
	d.light D333(TR)	2.63%
	d.light D333(UP)	1.55%
	d.light S500(AS)	0.00%
	d.light S500(UP)	2.63%
	d.light S500(UK)	0.00%
	d.light S550(AS)	0.97%
	d.light S550(BH)	1.39%
	d.light S550(MG)	1.42%
	d.light S550(TR)	0.00%
	d.light S550(UP)	1.20%
	Jugnu 2 Tubelight(CG)	0.00%
	Jugnu lightbox L1406(OD)	1.44%
	Jugnu Lightbox L2005(BH)	1.20%
	Jugnu Lightbox L2005(CG)	0.00%
	Jugnu Lightbox L2005(WB)	1.04%
	Sunking Boom(HR)	1.30%
	Sunking Boom(J&K)	0.00%
	Sunking Boom(PJ)	1.47%
	Sunking Boom(RJ)	1.47%
	Sunking Pro- 200(RJ)	0.00%
	GLP INDIA	
	Sunking Home 40Z(BH)	1.42%
	Sunking Home 40Z(KA)	0.00%
	Sunking Pro X plus(BH)	0.42%
	Sunking Pro X plus(CG)	1.29%
	Sunking Pro X plus(JK)	0.91%
	Sunking Pro X plus(MP)	1.22%
	Sunking Pro X plus(MH)	0.86%
	Sunking Pro X plus(OD)	0.77%

	Sunking Pro X plus(WB)	0.46%
Measurement methods and procedures	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" 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	<table> <tr> <th>Models</th><th>Value %</th></tr> <tr> <td>Midland</td><td>97.4%</td></tr> <tr> <td>d.light S550(BH)</td><td>96.3%</td></tr> <tr> <td>d.light S550(UP)</td><td>96.0%</td></tr> <tr> <td>Sunking Boom(HR)</td><td>97.4%</td></tr> <tr> <td>Sunking Boom(PJ)</td><td>96.5%</td></tr> <tr> <td>Sunking Boom(RJ)</td><td>94.9%</td></tr> <tr> <td>Sunking Pro200(HR)</td><td>96.9%</td></tr> <tr> <td>Sunking Pro200(RJ)</td><td>97.4%</td></tr> <tr> <td>Satin</td><td></td></tr> <tr> <td>Jugnu TWP29004(JK)</td><td>100.0%</td></tr> <tr> <td>Jugnu TWP29004(OD)</td><td>97.5%</td></tr> <tr> <td>Jugnu TWP29006(BH)</td><td>96.1%</td></tr> <tr> <td>Jugnu TWP29006(OD)</td><td>96.9%</td></tr> <tr> <td>Jugnu TWP29006(WB)</td><td>96.4%</td></tr> <tr> <td>Jugnu TWP29008(OD)</td><td>95.3%</td></tr> <tr> <td>Sunking Pico(RJ)</td><td>100.0%</td></tr> <tr> <td>d.light D333(AS)</td><td>96.7%</td></tr> <tr> <td>d.light D333(BH)</td><td>95.6%</td></tr> <tr> <td>d.light D333(JK)</td><td>90.9%</td></tr> <tr> <td>d.light D333(MG)</td><td>92.5%</td></tr> <tr> <td>d.light D333(TR)</td><td>93.6%</td></tr> <tr> <td>d.light D333(UP)</td><td>95.9%</td></tr> <tr> <td>d.light S500(AS)</td><td>100.0%</td></tr> <tr> <td>d.light S500(UP)</td><td>93.5%</td></tr> <tr> <td>d.light S500(UK)</td><td>100.0%</td></tr> <tr> <td>d.light S550(AS)</td><td>97.4%</td></tr> <tr> <td>d.light S550(BH)</td><td>96.7%</td></tr> <tr> <td>d.light S550(MG)</td><td>96.2%</td></tr> <tr> <td>d.light S550(TR)</td><td>100.0%</td></tr> </table>	Models	Value %	Midland	97.4%	d.light S550(BH)	96.3%	d.light S550(UP)	96.0%	Sunking Boom(HR)	97.4%	Sunking Boom(PJ)	96.5%	Sunking Boom(RJ)	94.9%	Sunking Pro200(HR)	96.9%	Sunking Pro200(RJ)	97.4%	Satin		Jugnu TWP29004(JK)	100.0%	Jugnu TWP29004(OD)	97.5%	Jugnu TWP29006(BH)	96.1%	Jugnu TWP29006(OD)	96.9%	Jugnu TWP29006(WB)	96.4%	Jugnu TWP29008(OD)	95.3%	Sunking Pico(RJ)	100.0%	d.light D333(AS)	96.7%	d.light D333(BH)	95.6%	d.light D333(JK)	90.9%	d.light D333(MG)	92.5%	d.light D333(TR)	93.6%	d.light D333(UP)	95.9%	d.light S500(AS)	100.0%	d.light S500(UP)	93.5%	d.light S500(UK)	100.0%	d.light S550(AS)	97.4%	d.light S550(BH)	96.7%	d.light S550(MG)	96.2%	d.light S550(TR)	100.0%
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d.light S550(MG)	96.2%																																																												
d.light S550(TR)	100.0%																																																												

	d.light S550(UP)	97.0%
	Jugnu 2 Tubelight(CG)	100.0%
	Jugnu lightbox L1406(OD)	96.2%
	Jugnu Lightbox L2005(BH)	97.0%
	Jugnu Lightbox L2005(CG)	100.0%
	Jugnu Lightbox L2005(WB)	97.3%
	Sunking Boom(HR)	96.3%
	Sunking Boom(J&K)	100.0%
	Sunking Boom(PJ)	96.1%
	Sunking Boom(RJ)	96.1%
	Sunking Pro- 200(RJ)	100.0%
	GLP INDIA	
	Sunking Home 40Z(BH)	96.1%
	Sunking Home 40Z(KA)	100.0%
	Sunking pro X plus(BH)	98.5%
	Sunking pro X plus(CG)	96.4%
	Sunking pro X plus(JK)	97.5%
	Sunking pro X plus(MP)	96.6%
	Sunking pro X plus(MH)	97.6%
	Sunking pro X plus(OD)	97.8%
	Sunking pro X plus(WB)	98.4%
Measurement methods and procedures	The value is calculated using the recorded value for $LFR_{i,v}$ – $CF_{i,v,LFR} = 1 - (LFR_{i,v} + z * \sqrt{LFR_{i,v} * (1 - LFR_{i,v})}) / n_{i,v,total}$	
Monitoring frequency	Annual	
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 which a valid result was obtained.

Source of data	Monitoring partner, Credit Tracker	
Value(s) applied	Models	Value
	Midland	
	d.light S550(BH)	61
	d.light S550(UP)	41
	Sunking Boom(HR)	40
	Sunking Boom(PJ)	60
	Sunking Boom(RJ)	42
	Sunking Pro200(HR)	34
	Sunking Pro200(RJ)	43
	Satin	
	Jugnu TWP29004(JK)	1
	Jugnu TWP29004(OD)	62
	Jugnu TWP29006(BH)	38
	Jugnu TWP29006(OD)	61
	Jugnu TWP29006(WB)	42
	Jugnu TWP29008(OD)	49
	Sunking Pico(RJ)	21
	d.light D333(AS)	42
	d.light D333(BH)	40
	d.light D333(JK)	29
	d.light D333(MG)	29
	d.light D333(TR)	30
	d.light D333(UP)	40
	d.light S500(AS)	5
	d.light S500(UP)	29
	d.light S500(UK)	30
	d.light S550(AS)	62
	d.light S550(BH)	61
	d.light S550(MG)	40
	d.light S550(TR)	30
	d.light S550(UP)	58
	Jugnu 2 Tubelight(CG)	30
	Jugnu lightbox L1406(OD)	42
	Jugnu Lightbox L2005(BH)	61

	Jugnu Lightbox L2005(CG)	12
	Jugnu Lightbox L2005(WB)	61
	Sunking Boom(HR)	36
	Sunking Boom(J&K)	8
	Sunking Boom(PJ)	41
	Sunking Boom(RJ)	41
	Sunking Pro- 200(RJ)	28
	GLP INDIA	
	Sunking Home 40Z(BH)	39
	Sunking Home 40Z(KA)	8
	Sunking Pro X plus(BH)	62
	Sunking Pro X plus(CG)	41
	Sunking Pro X plus(JK)	60
	Sunking Pro X plus(MP)	41
	Sunking Pro X plus(MH)	62
	Sunking Pro X plus(OD)	62
	Sunking Pro X plus(WB)	61
Measurement methods and procedures	The solar lighting systems are monitored based on a survey with sample size calculated in line with the CDM standard for Sampling and surveys for CDM project activities and programme of activities version 9.0 and guideline for 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.
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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.

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	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. 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)
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	<table> <tr> <th>Models</th><th>Installations</th></tr> <tr> <td>GLP INDIA</td><td></td></tr> <tr> <td>Sunking HLS(BH)</td><td>6</td></tr> <tr> <td>Sunking HLS(JK)</td><td>1</td></tr> <tr> <td>Sunking HLS(KA)</td><td>113</td></tr> <tr> <td>Sunking HLS(TL)</td><td>3</td></tr> </table>	Models	Installations	GLP INDIA		Sunking HLS(BH)	6	Sunking HLS(JK)	1	Sunking HLS(KA)	113	Sunking HLS(TL)	3
Models	Installations												
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 coordinates or other specific location identifiers) in the MEC Tracker System. Associated data will reside in the MEC Tracker Database, allowing each installation to be monitored on a regular basis. The data in MEC tracker system can be crosschecked with the MIS system of the PO.
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 have been deployed in period a were operating in period v																																				
Source of data	Monitoring partner, Credit Tracker																																				
Value(s) applied	<table> <tr> <th>Models</th><th>Days</th></tr> <tr> <td>GLP INDIA</td><td></td></tr> <tr> <td>GLP_SunkingHLS(BH)</td><td>365</td></tr> <tr> <td>GLP _SunkingHLS(JK)</td><td>365</td></tr> <tr> <td>GLP_SunkingHLS(KA)</td><td>362</td></tr> <tr> <td>GLP_SunkingHLS(TL)</td><td>365</td></tr> <tr> <td>GLP_SunkingHLS(WB)</td><td>365</td></tr> <tr> <td>GLP_SunkingHLS120(KA)</td><td>365</td></tr> <tr> <td>GLP_SunkingHLS120(OD)</td><td>365</td></tr> <tr> <td>GLP_SunkingHome40Z(BH)</td><td>358</td></tr> <tr> <td>GLP_SunkingHome40Z(CG)</td><td>345</td></tr> <tr> <td>GLP_SunkingHome40Z(KA)</td><td>353</td></tr> <tr> <td>GLP_SunkingHome40Z(JK)</td><td>361</td></tr> <tr> <td>GLP_SunkingHome40Z(TL)</td><td>365</td></tr> <tr> <td>GLP_SunkingHome40Z(UP)</td><td>355</td></tr> <tr> <td>GLP_SunkingBoom(BH)</td><td>358</td></tr> <tr> <td>GLP_Sunking Boom(CG)</td><td>348</td></tr> <tr> <td>GLP_Sunking Boom(JK)</td><td>356</td></tr> </table>	Models	Days	GLP INDIA		GLP_SunkingHLS(BH)	365	GLP _SunkingHLS(JK)	365	GLP_SunkingHLS(KA)	362	GLP_SunkingHLS(TL)	365	GLP_SunkingHLS(WB)	365	GLP_SunkingHLS120(KA)	365	GLP_SunkingHLS120(OD)	365	GLP_SunkingHome40Z(BH)	358	GLP_SunkingHome40Z(CG)	345	GLP_SunkingHome40Z(KA)	353	GLP_SunkingHome40Z(JK)	361	GLP_SunkingHome40Z(TL)	365	GLP_SunkingHome40Z(UP)	355	GLP_SunkingBoom(BH)	358	GLP_Sunking Boom(CG)	348	GLP_Sunking Boom(JK)	356
Models	Days																																				
GLP INDIA																																					
GLP_SunkingHLS(BH)	365																																				
GLP _SunkingHLS(JK)	365																																				
GLP_SunkingHLS(KA)	362																																				
GLP_SunkingHLS(TL)	365																																				
GLP_SunkingHLS(WB)	365																																				
GLP_SunkingHLS120(KA)	365																																				
GLP_SunkingHLS120(OD)	365																																				
GLP_SunkingHome40Z(BH)	358																																				
GLP_SunkingHome40Z(CG)	345																																				
GLP_SunkingHome40Z(KA)	353																																				
GLP_SunkingHome40Z(JK)	361																																				
GLP_SunkingHome40Z(TL)	365																																				
GLP_SunkingHome40Z(UP)	355																																				
GLP_SunkingBoom(BH)	358																																				
GLP_Sunking Boom(CG)	348																																				
GLP_Sunking Boom(JK)	356																																				

	GLP_Sunking Boom(KA)	356
	GLP_Sunking Boom(MP)	355
	GLP_Sunking Boom(TN)	359
	GLP_Sunking Boom(TL)	356
	GLP_Sunking Boom(UP)	358
	GLP_Sunking Boom(WB)	356
	GLP_Sunkingpicopls(KA)	351
	GLP_Sunkingpicoplus(TL)	359
	GLP_Sunkingpicoplus(UP)	354
	GLP_Sunkingpicoplus(WB)	355
	GLP_SunkingPro200(CG)	365
	GLP_SunkingPro200(JK)	365
	GLP_SunkingPro200(KA)	365
	GLP_SunkingPro200(MP)	355
	GLP_SunkingPro200(OD)	359
	GLP_SunkingPro200(TL)	357
	GLP_SunkingPro200(UP)	357
	GLP_SunkingPro200(WB)	356
	GLP_SunkingPro300(AS)	356
	GLP_SunkingPro300(CG)	359
	GLP_SunkingPro300(HR)	344
	GLP_SunkingPro300(KA)	359
	GLP_SunkingPro300(MH)	365
	GLP_SunkingPro300(PJ)	348
	GLP_SunkingPro300(RJ)	359
	GLP_SunkingPro300(TL)	355
	GLP_SunkingPro300(TR)	357
	GLP_SunkingPro300(UP)	353
	GLP_SunkingPro300(WB)	357
	GLP_SunkingPro400(BH)	361
	GLP_SunkingPro400(JK)	359
	GLP_SunkingPro400(KA)	356
	GLP_SunkingPro400(MP)	355
	GLP_SunkingPro400(TL)	356

	GLP_SunkingPro400(UP)	359
	GLP_SunkingPro400(WB)	361
	GLP_SunkingProEasybuy (KA)	358
	GLP_SunkingProEasybuy(TL)	355
	GLP_SunkingProEasybuy(UP)	358
	GLP_SunkingProEasybuy(WB)	358
	GLP_SunkingPro2(AS)	356
	GLP_SunkingPro2(KA)	358
	GLP_SunkingPro2(TL)	358
	GLP_SunkingPro2(UP)	352
	GLP_SunkingPro2(WB)	356
	GLP_SunkingProAn(BH)	365
	GLP_SunkingProAN(JK)	365
	GLP_SunkingProAN(KA)	353
	GLP_SunkingProAN(OD)	357
	GLP_SunkingProAN(UP)	357
	GLP_SunkingProAN(WB)	353
	GLP_SunkingProX(BH)	360
	GLP_SunkingProX(JK)	359
	GLP_SunkingProX(KA)	359
	GLP_SunkingProX(TL)	365
	GLP_SunkingProX(UP)	358
	GLP_SunkingProX(WB)	352
	Arman	
	Sunking Boom(GJ)	362
	Sunking Boom(MP)	352
	Sunking Boom(MH)	360
Measurement methods and procedures	Exact date of sale (in the case of solar lights) and installation (in the case of solar home systems) for all clean energy 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 frequency	Annual	

QA/QC procedures	The data in MEC tracker system can be cross checked with the MIS system of the PO – GLP, Asirvad, Arohan, SKDRDP.
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	H
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 type <i>i</i> in checked sample group <i>gi,v</i> not operational in period <i>v</i>	
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)	0.88%
	GLP_SunkingHLS(TL)	0.00%
	GLP_SunkingHLS(WB)	0.00%
	GLP_SunkingHLS120(KA)	0.00%
	GLP_SunkingHLS120(OD)	0.00%
	GLP_SunkingHome40Z(BH)	1.82%
	GLP_SunkingHome40Z(CG)	5.56%

	GLP_SunkingHome40Z(KA)	3.33%
	GLP_SunkingHome40Z(JK)	1.12%
	GLP_SunkingHome40Z(TL)	0.00%
	GLP_SunkingHome40Z(UP)	2.80%
	GLP_SunkingBoom(BH)	1.88%
	GLP_Sunking Boom(CG)	4.76%
	GLP_Sunking Boom(JK)	2.42%
	GLP_Sunking Boom(KA)	2.43%
	GLP_Sunking Boom(MP)	2.63%
	GLP_Sunking Boom(TN)	1.67%
	GLP_Sunking Boom(TL)	2.60%
	GLP_Sunking Boom(UP)	1.89%
	GLP_Sunking Boom(WB)	2.46%
	GLP_Sunkingpicopls(KA)	3.85%
	GLP_Sunkingpicoplus(TL)	1.74%
	GLP_Sunkingpicoplus(UP)	3.08%
	GLP_Sunkingpicoplus(WB)	2.63%
	GLP_SunkingPro200(CG)	0.00%
	GLP_SunkingPro200(JK)	0.00%
	GLP_SunkingPro200(KA)	0.00%
	GLP_SunkingPro200(MP)	2.70%
	GLP_SunkingPro200(OD)	1.61%
	GLP_SunkingPro200(TL)	2.17%
	GLP_SunkingPro200(UP)	2.23%
	GLP_SunkingPro200(WB)	2.50%
	GLP_SunkingPro300(AS)	2.42%
	GLP_SunkingPro300(CG)	1.70%
	GLP_SunkingPro300(HR)	5.71%
	GLP_SunkingPro300(KA)	1.63%
	GLP_SunkingPro300(MH)	0.00%
	GLP_SunkingPro300(PJ)	4.55%
	GLP_SunkingPro300(RJ)	1.69%
	GLP_SunkingPro300(TL)	2.86%
	GLP_SunkingPro300(TR)	2.27%

	GLP_SunkingPro300(UP)	3.31%
	GLP_SunkingPro300(WB)	2.27%
	GLP_SunkingPro400(BH)	1.00%
	GLP_SunkingPro400(JK)	1.70%
	GLP_SunkingPro400(KA)	2.56%
	GLP_SunkingPro400(MP)	2.80%
	GLP_SunkingPro400(TL)	2.54%
	GLP_SunkingPro400(UP)	1.52%
	GLP_SunkingPro400(WB)	1.23%
	GLP_SunkingProEasybuy (KA)	1.86%
	GLP_SunkingProEasybuy(TL)	2.73%
	GLP_SunkingProEasybuy(UP)	1.79%
	GLP_SunkingProEasybuy(WB)	1.80%
	GLP_SunkingPro2(AS)	2.54%
	GLP_SunkingPro2(KA)	1.81%
	GLP_SunkingPro2(TL)	2.03%
	GLP_SunkingPro2(UP)	3.51%
	GLP_SunkingPro2(WB)	2.41%
	GLP_SunkingProAn(BH)	0.00%
	GLP_SunkingProAN(JK)	0.00%
	GLP_SunkingProAN(KA)	3.33%
	GLP_SunkingProAN(OD)	2.26%
	GLP_SunkingProAN(UP)	2.08%
	GLP_SunkingProAN(WB)	3.33%
	GLP_SunkingProX(BH)	1.28%
	GLP_SunkingProX(JK)	1.78%
	GLP_SunkingProX(KA)	1.54%
	GLP_SunkingProX(TL)	0.00%
	GLP_SunkingProX(UP)	1.81%
	GLP_SunkingProX(WB)	3.57%
	Arman	
	Sunking Boom(GJ)	0.95%
	Sunking Boom(MP)	3.57%
	Sunking Boom(MH)	1.49%

Measurement methods and procedures	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" 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	<table> <tr> <th>Models</th><th>Value %</th></tr> <tr> <td>GLP INDIA</td><td></td></tr> <tr> <td>GLP_SunkingHLS(BH)</td><td>100.00%</td></tr> <tr> <td>GLP _SunkingHLS(JK)</td><td>100.00%</td></tr> <tr> <td>GLP_SunkingHLS(KA)</td><td>96.87%</td></tr> <tr> <td>GLP_SunkingHLS(TL)</td><td>100.00%</td></tr> <tr> <td>GLP_SunkingHLS(WB)</td><td>100.00%</td></tr> <tr> <td>GLP_SunkingHLS120(KA)</td><td>100.00%</td></tr> <tr> <td>GLP_SunkingHLS120(OD)</td><td>100.00%</td></tr> <tr> <td>GLP_SunkingHome40Z(BH)</td><td>95.96%</td></tr> <tr> <td>GLP_SunkingHome40Z(CG)</td><td>87.28%</td></tr> <tr> <td>GLP_SunkingHome40Z(KA)</td><td>92.37%</td></tr> <tr> <td>GLP_SunkingHome40Z(JK)</td><td>96.36%</td></tr> <tr> <td>GLP_SunkingHome40Z(TL)</td><td>100.00%</td></tr> <tr> <td>GLP_SunkingHome40Z(UP)</td><td>93.24%</td></tr> <tr> <td>GLP_SunkingBoom(BH)</td><td>95.87%</td></tr> <tr> <td>GLP_Sunking Boom(CG)</td><td>89.10%</td></tr> <tr> <td>GLP_Sunking Boom(JK)</td><td>95.02%</td></tr> <tr> <td>GLP_Sunking Boom(KA)</td><td>95.02%</td></tr> <tr> <td>GLP_Sunking Boom(MP)</td><td>93.53%</td></tr> <tr> <td>GLP_Sunking Boom(TN)</td><td>96.28%</td></tr> <tr> <td>GLP_Sunking Boom(TL)</td><td>93.52%</td></tr> <tr> <td>GLP_Sunking Boom(UP)</td><td>95.44%</td></tr> <tr> <td>GLP_Sunking Boom(WB)</td><td>93.83%</td></tr> <tr> <td>GLP_Sunkingpicopls(KA)</td><td>91.55%</td></tr> <tr> <td>GLP_Sunkingpicoplus(TL)</td><td>95.13%</td></tr> <tr> <td>GLP_Sunkingpicoplus(UP)</td><td>93.44%</td></tr> <tr> <td>GLP_Sunkingpicoplus(WB)</td><td>93.53%</td></tr> <tr> <td>GLP_SunkingPro200(CG)</td><td>100.00%</td></tr> <tr> <td>GLP_SunkingPro200(JK)</td><td>100.00%</td></tr> <tr> <td>GLP_SunkingPro200(KA)</td><td>100.00%</td></tr> </table>	Models	Value %	GLP INDIA		GLP_SunkingHLS(BH)	100.00%	GLP _SunkingHLS(JK)	100.00%	GLP_SunkingHLS(KA)	96.87%	GLP_SunkingHLS(TL)	100.00%	GLP_SunkingHLS(WB)	100.00%	GLP_SunkingHLS120(KA)	100.00%	GLP_SunkingHLS120(OD)	100.00%	GLP_SunkingHome40Z(BH)	95.96%	GLP_SunkingHome40Z(CG)	87.28%	GLP_SunkingHome40Z(KA)	92.37%	GLP_SunkingHome40Z(JK)	96.36%	GLP_SunkingHome40Z(TL)	100.00%	GLP_SunkingHome40Z(UP)	93.24%	GLP_SunkingBoom(BH)	95.87%	GLP_Sunking Boom(CG)	89.10%	GLP_Sunking Boom(JK)	95.02%	GLP_Sunking Boom(KA)	95.02%	GLP_Sunking Boom(MP)	93.53%	GLP_Sunking Boom(TN)	96.28%	GLP_Sunking Boom(TL)	93.52%	GLP_Sunking Boom(UP)	95.44%	GLP_Sunking Boom(WB)	93.83%	GLP_Sunkingpicopls(KA)	91.55%	GLP_Sunkingpicoplus(TL)	95.13%	GLP_Sunkingpicoplus(UP)	93.44%	GLP_Sunkingpicoplus(WB)	93.53%	GLP_SunkingPro200(CG)	100.00%	GLP_SunkingPro200(JK)	100.00%	GLP_SunkingPro200(KA)	100.00%
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	GLP_SunkingPro200(MP)	93.34%
	GLP_SunkingPro200(OD)	96.30%
	GLP_SunkingPro200(TL)	94.33%
	GLP_SunkingPro200(UP)	94.17%
	GLP_SunkingPro200(WB)	93.76%
	GLP_SunkingPro300(AS)	94.49%
	GLP_SunkingPro300(CG)	95.78%
	GLP_SunkingPro300(HR)	88.63%
	GLP_SunkingPro300(KA)	95.89%
	GLP_SunkingPro300(MH)	100.00%
	GLP_SunkingPro300(PJ)	89.59%
	GLP_SunkingPro300(RJ)	95.70%
	GLP_SunkingPro300(TL)	93.15%
	GLP_SunkingPro300(TR)	94.16%
	GLP_SunkingPro300(UP)	92.33%
	GLP_SunkingPro300(WB)	94.16%
	GLP_SunkingPro400(BH)	97.59%
	GLP_SunkingPro400(JK)	96.18%
	GLP_SunkingPro400(KA)	93.58%
	GLP_SunkingPro400(MP)	93.24%
	GLP_SunkingPro400(TL)	93.63%
	GLP_SunkingPro400(UP)	96.13%
	GLP_SunkingPro400(WB)	96.14%
	GLP_SunkingProEasybuy (KA)	95.89%
	GLP_SunkingProEasybuy(TL)	93.37%
	GLP_SunkingProEasybuy(UP)	95.04%
	GLP_SunkingProEasybuy(WB)	94.96%
	GLP_SunkingPro2(AS)	94.25%
	GLP_SunkingPro2(KA)	95.57%
	GLP_SunkingPro2(TL)	94.60%
	GLP_SunkingPro2(UP)	92.01%
	GLP_SunkingPro2(WB)	94.04%
	GLP_SunkingProAn(BH)	100.00%
GLP_SunkingProAN(JK)	100.00%	

	GLP_SunkingProAN(KA)	92.37%
	GLP_SunkingProAN(OD)	94.81%
	GLP_SunkingProAN(UP)	94.50%
	GLP_SunkingProAN(WB)	92.37%
	GLP_SunkingProX(BH)	96.84%
	GLP_SunkingProX(JK)	96.04%
	GLP_SunkingProX(KA)	96.06%
	GLP_SunkingProX(TL)	100.00%
	GLP_SunkingProX(UP)	95.56%
	GLP_SunkingProX(WB)	91.90%
	Arman	
	Sunking Boom(GJ)	97.45%
	Sunking Boom(MP)	92.55%
	Sunking Boom(MH)	96.50%
Measurement methods and procedures	The value is calculated using the recorded value for $LFR_{i,v}$ – $CF_{i,v,LFR} = 1 - (LFR_{i,v} + z * \sqrt{LFR_{i,v} * (1 - LFR_{i,v})}) / n_{i,v,total}$	
Monitoring frequency	Annual	
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 _{r,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	<table><tr><th>Models</th><th>Value</th></tr><tr><td>GLP INDIA</td><td></td></tr><tr><td>GLP_SunkingHLS(BH)</td><td>6</td></tr><tr><td>GLP _SunkingHLS(JK)</td><td>1</td></tr><tr><td>GLP_SunkingHLS(KA)</td><td>29</td></tr><tr><td>GLP_SunkingHLS(TL)</td><td>3</td></tr></table>		Models	Value	GLP INDIA		GLP_SunkingHLS(BH)	6	GLP _SunkingHLS(JK)	1	GLP_SunkingHLS(KA)	29	GLP_SunkingHLS(TL)	3
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)	61
	GLP_SunkingHome40Z(CG)	17
	GLP_SunkingHome40Z(KA)	29
	GLP_SunkingHome40Z(JK)	29
	GLP_SunkingHome40Z(TL)	13
	GLP_SunkingHome40Z(UP)	29
	GLP_SunkingBoom(BH)	61
	GLP_Sunking Boom(CG)	20
	GLP_Sunking Boom(JK)	60
	GLP_Sunking Boom(KA)	61
	GLP_Sunking Boom(MP)	29
	GLP_Sunking Boom(TN)	65
	GLP_Sunking Boom(TL)	28
	GLP_Sunking Boom(UP)	43
	GLP_Sunking Boom(WB)	29
	GLP_Sunkingpicopls(KA)	29
	GLP_Sunkingpicoplus(TL)	29
	GLP_Sunkingpicoplus(UP)	41
	GLP_Sunkingpicoplus(WB)	29
	GLP_SunkingPro200(CG)	5
	GLP_SunkingPro200(JK)	16
	GLP_SunkingPro200(KA)	2
	GLP_SunkingPro200(MP)	28
	GLP_SunkingPro200(OD)	60
	GLP_SunkingPro200(TL)	29
	GLP_SunkingPro200(UP)	28
	GLP_SunkingPro200(WB)	29
	GLP_SunkingPro300(AS)	41
	GLP_SunkingPro300(CG)	44
	GLP_SunkingPro300(HR)	28
	GLP_SunkingPro300(KA)	43

	GLP_SunkingPro300(MH)	5
	GLP_SunkingPro300(PJ)	21
	GLP_SunkingPro300(RJ)	41
	GLP_SunkingPro300(TL)	29
	GLP_SunkingPro300(TR)	29
	GLP_SunkingPro300(UP)	28
	GLP_SunkingPro300(WB)	29
	GLP_SunkingPro400(BH)	83
	GLP_SunkingPro400(JK)	62
	GLP_SunkingPro400(KA)	28
	GLP_SunkingPro400(MP)	29
	GLP_SunkingPro400(TL)	28
	GLP_SunkingPro400(UP)	45
	GLP_SunkingPro400(WB)	29
	GLP_SunkingProEasybuy (KA)	60
	GLP_SunkingProEasybuy(TL)	29
	GLP_SunkingProEasybuy(UP)	29
	GLP_SunkingProEasybuy(WB)	28
	GLP_SunkingPro2(AS)	40
	GLP_SunkingPro2(KA)	43
	GLP_SunkingPro2(TL)	29
	GLP_SunkingPro2(UP)	28
	GLP_SunkingPro2(WB)	31
	GLP_SunkingProAn(BH)	30
	GLP_SunkingProAN(JK)	4
	GLP_SunkingProAN(KA)	29
	GLP_SunkingProAN(OD)	43
	GLP_SunkingProAN(UP)	29
	GLP_SunkingProAN(WB)	29
	GLP_SunkingProX(BH)	60
	GLP_SunkingProX(JK)	61
	GLP_SunkingProX(KA)	44
	GLP_SunkingProX(TL)	12
	GLP_SunkingProX(UP)	43

	GLP_SunkingProX(WB)	28
	Arman	
	Sunking Boom(GJ)	61
	Sunking Boom(MP)	38
	Sunking Boom(MH)	61
Measurement methods and procedures	The solar lighting systems are monitored based on a survey with sample size calculated in line with the CDM standard for Sampling and surveys for CDM project activities and programme of activities version 9.0 and guideline for 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 Number	Value
	VPA23	79.45%
	VPA33	74.80%
Measurement methods and procedures	Monitoring and recording of number of WPS distributed 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 Number	Value
	VPA23	13,105
	VPA33	948

Measurement methods and procedures	Monitoring and recording of number of WPS operational under the project
Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	SDG 1 contribution
Additional comment	-

SDG 7

Data / Parameter	ACS _{Project}		
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 Number	SLS	WPS
	VPA22	213,829	-
	VPA23	42,791	13,894
	VPA33	209,894	1,013
	VPA34	98,538	-
Measurement methods and procedures	Monitor the number of WPS/SLS distributed under the 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
	VPA22	30	127
	VPA23	25	113
	VPA33	18	50
	VPA34	5	22
Measurement methods and procedures	Recording the number of employees (male / female) in the project under administrative, sales, production and		

	management positions. Employment record with date 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 period¹⁴¹⁵

The monitoring period for the project is 01/01/2021-31/12/2021, which is the first monitoring period under GS4GG. Under CDM, CME used AMS III AV and AMS I A methodology for WPS and SLS. During transition to GS4GG, solar methodology is same however, WPS methodology has been changed to GS Safe drinking water meth version 1. Hence, CME has compared SLS in the below table. For WPS, the parameters are monitored for the first time, and there is no other data to compare. Furthermore, SDG 1, 6, 7 were not part of CDM hence there is no data to compare.

Data/Parameter	Value obtained in this monitoring period		Value obtained last monitoring period	
$N_{i,a}$	VPA	$N_{i,a}$	VPA	$N_{i,a}$
	VPA22	217,844	22	217,844
	VPA23	44,023	23	44,023
	VPA33	214,519	33	214,519
	VPA34	102,220	34	102,220
$LFR_{i,v}$	Refer to "comparison" tab in ER sheet		Refer to "comparison" tab in ER sheet	
$CF_{i,v,LFR}$	Refer to "comparison" tab in ER sheet		Refer to "comparison" tab in ER sheet	
$n_{i,v,total}$	Refer to "comparison" tab in ER sheet		Refer to "comparison" tab in ER sheet	
SDG 13	VPA	$N_{i,a}$	VPA	$N_{i,a}$
	VPA22	74,611	VPA22	31,046
	VPA23	56,030	VPA23	12,070
	VPA33	76,556	VPA33	32,203
	VPA34	34,509	VPA34	15,054

D.4. Implementation of sampling plan

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Sampling plan was applied to all the following VPAs included in this issuance request: VPA22, VPA23, VPA33 and VPA34 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.

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. VPA23, table below shows the vintage split for GLP Sinking Boom (BH) with a total sample requirement of 38:

Model	State	Sample Requirement	Vintage Period	Sales based on corresponding vintage	Fraction of Each Vintage in the Sales Population	Samples Monitored for Each Vintage	Fraction of Each Vintage in the Monitored Samples
Sinking HLS	Bihar	38	0-1 (01/01/2021 to 31/12/2021)	0	0	0	0
			1-2 (01/01/2020 to 31/12/2020)	96	53%	20	53%
			2-3 (01/01/2019 to 31/12/2019)	86	47%	18	47%

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 state across the country. Population is homogenous within a state. Due to the homogeneity feature within the state, simple random sampling method was applied. 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. Usage survey was conducted in person. 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:

For e.g. VPA23, table below shows vintage split for Asirvad (Bihar):

Vintage Year	Total Sales	Required Samples
2019	3,193	81
2020	738	30

- **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 VPA23 and 93% households in VPA33 found to fulfil "basic" hygiene practices which means availability of a handwashing facility with soap and water at home. 85.15% of households in VPA23 and 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. VPA22:GS11500

Parameter	Monitoring Frequency	CEPs added during this MP (01/01/2021 to 31/12/2021)	Previous monitoring dates	Validity of the previous monitoring results till	New Monitoring for this MP
Usage/Project Survey	Annual	No	No implementation till date	-	No
Water testing	Annual	No	No implementation till date	-	No
Solar Lighting System	Annual	Yes	20/01/2021 to 20/02/2021	31/12/2021	Yes

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. VPA23: GS11499

Parameter	Monitoring Frequency	CEPs added during this MP (01/01/2021 to 31/12/2021)	Previous monitoring dates	Validity of the previous monitoring results till	New Monitoring for this MP
Usage/Project Survey	Annual	No	21/01/2021 to 20/02/2021	31/12/2021	Yes
Water testing	Annual	No	21/01/2021 to 20/02/2021	31/12/2021	Yes

Solar Lighting System	Annual	Yes	20/01/2021 to 20/02/2021	31/12/2021	Yes
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Water Purification System: Monitoring field surveys/field tests for various parameters in this monitoring period was conducted from 06/01/2022 to 30/01/2022. 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 07/01/2022 to 13/02/2022 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.

4. VPA33: GS1190

Parameter	Monitoring Frequency	CEPs added during this MP (01/01/2021 to 31/12/2021)	Previous monitoring dates	Validity of the previous monitoring results till	New Monitoring for this MP
Usage/Project Survey	Annual	No	10/01/2021 to 10/02/2021	31/12/2021	Yes
Water testing	Annual	No	10/01/2021 to 10/02/2021	31/12/2021	Yes
Solar Lighting System	Annual	Yes	05/01/2021 to 12/02/2021	31/12/2021	Yes

Water Purification System: Monitoring field surveys/field tests for various parameters in this monitoring period was conducted from 04/01/2022 to 26/01/2022. 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.

5. VPA34: GS11489

Parameter	Monitoring Frequency	CEPs added during this MP (01/01/2021 to 31/12/2021)	Previous monitoring dates	Validity of the previous monitoring results till	New Monitoring for this MP
Usage/Project Survey	Annual	No implementation till date	-	No	Yes
Water testing	Annual	No implementation till date	-	No	Yes
Solar Lighting System	Annual	Yes	20/01/2021 to 20/02/2021	31/12/2021	Yes

Solar lighting systems: Monitoring field surveys for various parameters in this monitoring period were conducted in 02/01/2022 to 22/03/2022 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. VPA22: GS11500

Solar lighting systems (SKDRDP, Arman, Arohan, Asirvad, ESAF GLP, d.light, Samasta and Midland):

S.No.	Parameter	Sampling approach	Sample size	Comments
1	Total number of lamps checked for	Simple random sampling for	For e.g.	As per guidance given in para 13 and 14, page 6 and 7 of Standard for

	which a valid result was obtained	mean based parameter	As per sample size calculation, sample size requirement for: ESAF Sunking Pico Plus (TN) - 26 GLP Sunking Boom (HR) - 14 Samasta Sunking HLS (BH) - 40 Actual monitored samples for: ESAF Sunking Pico Plus (TN) - 30 GLP Sunking Boom (HR) - 25 Samasta Sunking HLS (BH) - 40	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 e.g. 30 samples are chosen randomly for monitoring for ESAF Sunking Pico Plus (TN). For some of the models like GLP Sunking Boom (HR), the total number of sales are less than 30 and hence all units (25) are sampled. For some models like Samasta Sunking HLS (BH), the sample size is more than 30 and hence the required sample size (40) are randomly selected and monitored. Detailed sample size for all other models and calculation is provided in Emission reduction calculation sheet.
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2. VPA23: GS11499

Solar lighting systems (Arohan, Asirvad and GLP):

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: Asirvad Glosolar Mini (UP) - 19 GLP Sunking Pico Plus (UP) - 12 Arohan d.light S500 (AS) - 46 Actual monitored samples for: Asirvad Glosolar Mini (UP) - 30	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 e.g. 30 samples are chosen randomly for monitoring for Asirvad Glosolar Mini (JK). For some of the models like GLP Sunking Pico Plus (UP), the total number of sales are less than 30 and hence all units (17) are sampled. For some models like Arohan d.light S500 (AS), the sample size is more than or equal to 30 and hence the required sample size requirement (46) are randomly selected and monitored. Detailed sample size for all other models and calculation is provided in Emission

			GLP Sunking Pico Plus (UP) - 17 Arohan d.light S500 (AS) - 46	reduction calculation sheet.
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Water Purification System (Midland, Samasta, Svasti, Asirvad):

S.No.	Parameter	Sampling approach	Sample size
1	Usage $U_{p,y}$	Simple random sampling	1,099 (across 4 POs and 12 states)
2	Water Quality M_q	Simple random sampling	1,099 (across 4 POs and 12 states)

3. VPA33: GS11490

Solar lighting systems (Midland, Satin and GLP):

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: Satin Jugnu 2 Tubelight (CG) – 22 Satin Sunking Pico (RJ) – 14	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 e.g. 30 samples are chosen randomly for monitoring for Satin Jugnu 2 Tubelight (CG). For some of the

			GLP Sunking Home 40z (BH) -42 Actual monitored samples for: Satin Jugnu 2 Tubelight (CG) – 30 Satin Sunking Pico (RJ) – 21 GLP Sunking Home 40z (BH) -42	models like Satin Sunking Pico (RJ), the total number sales is less than 30 and hence all units (21) are sampled. For some models like GLP Sunking Home 40z (BH), the sample size is more than 30 and hence the required sample size (42) are randomly selected and monitored. Detailed sample size for all other models and calculation is provided in Emission reduction calculation sheet.).
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Water Purification System (Midland):

S.No.	Parameter	Sampling 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)

4. VPA34: GS11489

Solar lighting systems (GLP and Arman):

S.No.	Parameter	Sampling approach	Sample size	Comments
1	Total number of lamps	Simple random	For e.g.	As per guidance given in para 13 and 14, page 6

	checked for which a valid result was obtained	sampling for mean based parameter	As per sample size calculation, sample size requirement for: GLP Sunking HLS(BH)-6 Arman Sunking Boom(GJ)-67 Actual monitored samples for: GLP Sunking HLS(BH)-6 Arman Sunking Boom(GJ)-67	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 some models like Arman Sunking Boom(GJ), the sample size is more than 30 and hence the required sample size (67) are randomly selected and monitored. 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..
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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 the 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

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Calculations for Water Purification System and Solar Lighting Systems

SDG 13: Climate Action (WPS)

The Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y$$

Where:

ER_y = Emission reductions in year y (t CO₂e/yr)

BE_y = Baseline emissions in year y (t CO₂e/yr)

PE_y = Project emissions in year y (t CO₂e/yr)

LE_y = 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)
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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

$$EF_b = SE_{w,b,y} * \sum(x_f * (EF_{b,f,CO2} * f_{NRB,f,y} + EF_{b,f,nonCO2})) f \div 10^9$$

Where:

EF_b	=	Emission factor for the use of fuel to obtain safe water in the baseline (tCO ₂ e/L)
$SE_{w,b,y}$	=	Specific energy required to boil water (kJ/L), to be calculated as per the paragraph below
x_f	=	Proportion of fuel f used in the baseline (fraction determined based on an energy basis)
$EF_{b,f,CO2}$	=	CO ₂ emission factor from use of fuel f (tCO ₂ /TJ)
$EF_{b,f,nonCO2}$	=	Non-CO ₂ emission factor arising from use of fuel f, when the baseline fuel f is biomass or charcoal (tCO ₂ e/TJ). This parameter is omitted when f is a fossil fuel.
$f_{NRB,f,y}$	=	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 ($SE_{w,b,y}$) 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 Q_y is calculated using following method (for HWT and IWT)

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

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	VPA22	VPA23	VPA33	VPA34
Total Sales	0	16,318	1,248	0
BE_y	0	40,932	2,741	0

13: Climate Action: Solar Lighting Systems

Applied methodology/approach	Equation/calculation
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13.2.2 Amount of CO₂e emissions reduced by the project per year Approach: AMS.I.A., version 14.0	Total baseline emissions for period v are calculated as the sum of the baseline emissions of each lamp type i in the period: $= \sum_{i=1}^n BE_{i,v} \qquad \qquad \qquad (\text{Eq. 2})$ <table><tr><td>Parameter</td><td>Unit</td><td>Type</td><td>Value</td></tr><tr><td>BE_v</td><td>tCO₂</td><td>Calculated</td><td>Emissions generated in the absence of the project activity in period v by all lamps</td></tr><tr><td>BE_{i,v}</td><td>tCO₂</td><td>Calculated</td><td>Emissions generated in the absence of the project activity in period v by all lamps of type i</td></tr></table> Ex post baseline emission for each lamp type i is calculated with the following equation: $BE_v = \sum_{a=1}^n (N_{i,a} * d_{i,a,v}) * l_i * h * \frac{1}{LE_{ker}} * EF_{ker} * 10^{-6} * 3.6 * CF_{i,v,LFR}$ (Eq. 3) <table><tr><td>Parameter</td><td>Unit</td><td>Type</td><td>Value</td></tr><tr><td>BE_v</td><td>tCO₂</td><td>Calculated</td><td>Emissions generated in the absence of the project activity in period v by all lamps of type i</td></tr><tr><td>N_{i,a}</td><td>Number</td><td>Monitored</td><td>The total number of solar lamps of type i deployed in period a</td></tr><tr><td>d_{i,a,v}</td><td>Days</td><td>Monitored/calculated</td><td>Average number of days lamps of type i that have been deployed in period a were operating in period v</td></tr><tr><td>l_{i}</td><td>Lumen</td><td>Monitored (once per lamp type)</td><td>Nominal lumen output of solar lamps of the type I deployed as part of the project activity</td></tr></table>	Parameter	Unit	Type	Value	BE _v	tCO ₂	Calculated	Emissions generated in the absence of the project activity in period v by all lamps	BE _{i,v}	tCO ₂	Calculated	Emissions generated in the absence of the project activity in period v by all lamps of type i	Parameter	Unit	Type	Value	BE _v	tCO ₂	Calculated	Emissions generated in the absence of the project activity in period v by all lamps of type i	N _{i,a}	Number	Monitored	The total number of solar lamps of type i deployed in period a	d _{i,a,v}	Days	Monitored/calculated	Average number of days lamps of type i that have been deployed in period a were operating in period v	l _{i}	Lumen	Monitored (once per lamp type)	Nominal lumen output of solar lamps of the type I deployed as part of the project activity
Parameter	Unit	Type	Value																														
BE _v	tCO ₂	Calculated	Emissions generated in the absence of the project activity in period v by all lamps																														
BE _{i,v}	tCO ₂	Calculated	Emissions generated in the absence of the project activity in period v by all lamps of type i																														
Parameter	Unit	Type	Value																														
BE _v	tCO ₂	Calculated	Emissions generated in the absence of the project activity in period v by all lamps of type i																														
N _{i,a}	Number	Monitored	The total number of solar lamps of type i deployed in period a																														
d _{i,a,v}	Days	Monitored/calculated	Average number of days lamps of type i that have been deployed in period a were operating in period v																														
l _{i}	Lumen	Monitored (once per lamp type)	Nominal lumen output of solar lamps of the type I deployed as part of the project activity																														

	H	Hours /day	Fixed	Average operating hours of kerosene lamps in the baseline
	LE _{ker}	Lumen/W	Fixed	The specific light output of kerosene when burnt in a kerosene lantern
	EF _{ker}	tCO ₂ /GJ	Fixed	The specific CO ₂ -emissions of kerosene
	CF _{i,v,LFR}	-	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: $CF_{i,v,LFR} = 1 - \left(LFR_{i,v} + z^* \sqrt{\frac{LFR_{i,v} * (1 - LFR_{i,v})}{n_{i,v,total}}} \right) \quad (\text{Eq. 4})$				
	Parameter	Unit	Type	Value
	CF _{i,v,LFR}	-	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 registered PoA, project emissions and leakage emissions are not present and hence not included.
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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	VPA22	VPA23	VPA33	VPA34
Total Solar Sales	217,844	44,023	214,519	102,220
BE_v	74,611	15,098	73,815	34,509

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

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SDG 13: Climate Action

As the project envisage 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

BSA_{Project} Percentage of households having access to basic services in project for VPA22 = 0
 Percentage of households having access to basic services in project VPA23 = 79.45%
 Percentage of households having access to basic services in project VPA33 = 74.80%
 Percentage of households having access to basic services in project VPA34 = 0

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 VPA22 = 0
 Number of households served with satisfactory level of safe water for VPA23 = 13,105
 Number of households served with satisfactory level of safe water for VPA33 = 948
 Number of households served with satisfactory level of safe water for VPA34 = 0

SDG 7: Affordable and Clean Energy

VPA22

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) = 213,829

VPA23

ACS_{Project} Access to affordable and clean energy (Number of operating WPS units under Project) = 13,894
 Access to affordable and clean energy (Number of operating SLS units under Project) = 42,791

VPA33

ACS_{Project} Access to affordable and clean energy (Number of operating WPS units under Project) = 1,013
 Access to affordable and clean energy (Number of operating SLS units under Project) = 209,894

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) = 98,538

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 VPA22 = 177 (Female: 30; Male: 127)
 Quantitative Employment and income generation (Number of person (male and female) hired under Project) for VPA23 = 138 (Female: 25; Male: 113)
 Quantitative Employment and income generation (Number of person (male and female) hired under Project) for VPA33 = 68 (Female: 18; Male: 50)
 Quantitative Employment and income generation (Number of person (male and female) hired under Project) for VPA34 = 27 (Female: 5; Male: 22)

E.3. Calculation of leakage

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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 estimate	Project estimate	Net benefit
13	Climate Action (SLS)	VPA22- 74,611 VPA23- 15,098 VPA33- 73,815 VPA34- 34,509	0	VPA22- 74,611 VPA23- 15,098 VPA33- 73,815 VPA34- 34,509
13	Climate Action (WPS)	VPA22- 0 VPA23- 40,932 VPA33- 2,741 VPA34- 0	0	VPA22- 0 VPA23- 40,932 VPA33- 2,741 VPA34- 0
1	No poverty (WPS)	VPA22- 0 VPA23- 5.69% VPA33- 6.40% VPA34- 0	VPA22-0 VPA23-85.15% VPA33-81.20% VPA34-0	VPA22- 0 VPA23- 79.45% VPA33- 74.80% VPA34- 0
6	Clean Water and Sanitation (WPS)	0	VPA22- 0 VPA23- 13,105 VPA33- 948 VPA34- 0	VPA22- 0 VPA23- 13,105 VPA33- 948 VPA34- 0
7	Affordable and Clean Energy (WPS)	0	VPA22- 0 VPA23- 13,894	VPA22- 0 VPA23- 13,894

			VPA33- 1,013 VPA34- 0	VPA33- 1,013 VPA34- 0
7	Affordable and Clean Energy (SLS)	0	VPA22- 213,829 VPA23- 42,791 VPA33- 209,894 VPA34- 98,538	VPA22- 213,829 VPA23- 42,791 VPA33- 209,894 VPA34- 98,538
8	Decent Work and Economic Growth	0	VPA22-177 VPA23-138 VPA33- 68 VPA34- 27	VPA22-177 VPA23-138 VPA33- 68 VPA34- 27

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

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values ¹⁶ achieved during this monitoring period
13 (SLS)	VPA22- 193,548 VPA23- 167,370 VPA33- 90,104 VPA34-50,972	VPA22- 74,611 VPA23- 15,098 VPA33- 73,815 VPA34- 34,509
13 (WPS)	VPA22- 51,299 VPA23- 66,262 VPA33- 7,095 VPA34-2,413	VPA22- 0 VPA23- 40,932 VPA33- 2,741 VPA34- 0
13 (SLS+WPS)	VPA22-244,847 VPA23-233,632 VPA33-97,199 VPA34-53,385	VPA22- 74,611 VPA23- 56,030 VPA33- 76,556 VPA34- 34,509
1	VPA22- 95.00% VPA23- 94.33% VPA33- 93.28% VPA34- 94.9%	VPA22- 0 VPA23- 79.45% VPA33- 74.80% VPA34- 0
6	VPA22- 14,819 VPA23- 14,805 VPA33- 15,069 VPA34- 14,805	VPA22- 0 VPA23- 13,105 VPA33- 948 VPA34- 0
7 (WPS)	VPA22- 15,600 VPA23- 15,600 VPA33- 16,099 VPA34-15,600	VPA22- 0 VPA23- 13,894 VPA33- 1,013 VPA34- 0

7 (SLS)	VPA22- 977,138	VPA22- 213,829
	VPA23- 940,888	VPA23- 42,791
	VPA33- 985,808	VPA33- 209,894
	VPA34-940,888	VPA34- 98,538
8	VPA22-20	VPA22-177
	VPA23-20	VPA23-138
	VPA33-20	VPA33- 68
	VPA34-20	VPA34- 27

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

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"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 VPA22 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-2 (21/06/2020 to 20/06/2021) and Year-3 (21/06/2021 to 20/06/2022) of operation of VPAs from start date of crediting period is considered. Current monitoring period (01/01/2021 to 31/12/2021) falls in CP-1 Year-2 and Year-3 of the crediting period.

- The estimation of ex ante value is made for 171 days (Year 2 i.e. 01/01/2021 to 20/06/2021) and 194 days (Year 3 i.e. 21/06/2021 to 31/12/2021) totaling to 365 days (which is crediting days for this monitoring period¹⁷).

To achieve a comparable value of estimates for this monitoring period for VPA23 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 (21/06/2020 to 20/06/2021) and Year-3 (21/06/2021 to 20/06/2022) of operation of VPAs from start date of crediting period is considered. Current monitoring period (01/01/2021 to 31/12/2021) falls in CP-1 Year-2 and Year-3 of the crediting period.

- The estimation of ex ante value is made for 171 days (Year 2 i.e. 01/01/2021 to 20/06/2021) and 194 days (Year 3 i.e. 21/06/2021 to 31/12/2021) totaling to 365 days (which is crediting days for this monitoring period¹⁸.

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-2 (21/12/2020 to 20/12/2021) and Year-3 (21/12/2021 to 20/12/2022) of operation of VPAs from start date of crediting period is considered. Current monitoring period (01/01/2021 to 31/12/2021) falls in CP-1 Year-2 and Year-3 of the crediting period.
- The estimation of ex ante value is made for 354 days (Year 2 i.e 01/01/2021 to 20/12/2021) and 11 days (Year 3 i.e. 21/12/2021 to 31/12/2021) totaling to 365 days (which is crediting days for this monitoring period¹⁹.

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

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

SECTION F. SAFEGUARDS REPORTING

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Data / Parameter	Principle 6.1. Labour Rights
Unit	-

Gold Standard®

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 Asirvad, Greenlight Planet, Arman, Midland, SKDRDP, Svasti, Arohan, Samasta, d.light, Arohan, Arman, ESAF. 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 employment contracts of Asirvad, Greenlight Planet, Arman, Midland, SKDRDP, Svasti, Arohan, Samasta, d.light, Arohan, Arman, ESAF have been submitted to VVB.
Measurement methods and procedures	The employment contract is checked to ensure compliance with Principle 6.1
Monitoring frequency	Annual
QA/QC procedures	-
Purpose of data	For Safeguarding Principle 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 Asirvad, Midland, Svasti and Samasta staffs, if any waste scrap disposal happened in the current monitoring. For the current monitoring period, Asirvad, Midland, Svasti and Samasta received requests for waste scrap collection from the end users. Sample receipts have been submitted to VVB.
Measurement methods and procedures	Check the scrap disposal receipts and interview the PO staff to ensure compliance with Principle 9.4
Monitoring frequency	Annual
QA/QC procedures	-
Purpose of data	For Safeguarding Principle 9.4
Additional comment	-

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.

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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
Telephone Access (Optional)	-
Other	Email: info@muthoot.com , indira.ghosh@arohan.in , skdrdp@skdrdpindia.org , care@sunking.com , info@midlandmicrofin.com , info@d.light.com , info@cedarretail.in (ESAF), finance@armanindia.com , customer.care@iiflsamasta.com , info@svasti.in , info@svasti.in , pno@asirvad.in , info@satincreditcare.com , finance@armanindia.com

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

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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

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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. 01/01/2021 to 31/12/2021.

Revision History

Version	Date	Remarks
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