Gold Standard for the Global Goals

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

Programme of Activity Information

GS ID of Programme	GS11450
Title of Programme	Micro Energy Credits – Microfinance for Clean Energy Product Lines – India
Version of POA-DD applicable to this monitoring report	1.0
Name and GS ID of fully Validated CPA/VPAs (i.e. non compliance check)	NA

Key Project Information

GS ID (s) of Project (s)	GS11503, 11501, 11498, 11496
Title of the project (s) covered by monitoring report	Micro Energy Credits PoA – CPA 19- Clear Sky Partners Micro Energy Credits PoA – CPA 21- Clear Sky Partners Micro Energy Credits PoA – CPA 24- Clear Sky Partners Micro Energy Credits PoA – CPA 26- Clear Sky Partners
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	VPA19 – v4.1 VPA21 – v4.1 VPA24 – v3.1 VPA26 – v4.0
Version number of the monitoring report	3.0
Completion date of the monitoring report	17-10-2022
Date of project design certification	DDMMYYYY
Date of Last Annual Report	NA
Monitoring period number	1st
Duration of this monitoring period	01/01/2021 to 31/12/2021
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) Technologies and Practices to Displace Decentralized Thermal Energy Consumption (TPDDTEC), version 3.1
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	VPA19- 69,441 VPA21- 103,884 VPA24- 63,254 VPA26- 55,288	tCO_2e VERs
1 End poverty in all its forms everywhere	Number of households with clean energy products	VPA19- 21,000 VPA21- 22,000 VPA24- 21,000 VPA26- 20,124	Number ICS
1 End poverty in all its forms everywhere	Number of households with clean energy products i.e. SLS	VPA19- 40,164 VPA21- 136,182 VPA24- 237 VPA26- 175	Number SLS
3 Good Health and Wellbeing	% Households confirming less smoke with the use of improved cookstove	VPA19- 82% VPA21- 84% VPA24- 90% VPA26- 90%	%
5 Gender Equality	% Household reporting time saving on domestic work by women in collecting	VPA19- 82% VPA21- 84% VPA24- 90% VPA26- 90%	%

	fuel or cooking on traditional stove		
7 Affordable and Clean Energy	Number of beneficiaries (ICS)	VPA19- 17,220 VPA21- 18,450 VPA24- 18,900 VPA26- 18,112	Number
7 Affordable and Clean Energy	Number of beneficiaries (SLS)	VPA19- 39,445 VPA21- 131,242 VPA24- 204 VPA26- 167	Number
8 Decent Work and Economic Growth	Quantitative Employment and income generation	VPA19- 73 VPA21- 85 VPA24- 30 VPA26- 30	Number

Table 2 – Product Vintages

		Amount Achieved
Start Dates	**End Dates**	**VERs**
01/01/2021	31/12/2021	291,867

SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

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The project activity is implemented in India. In the rural areas in India, the predominant means of cooking are traditional cook stoves that use woody biomass as fuel. The smoke and fumes from these traditional inefficient stoves contribute heavily to indoor air pollution, which overall claim approximately 400,000 lives per year in India[1]. 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 use kerosene for indoor lighting, which also contributes to indoor air pollution and GHG emissions.

[1] http://www.pciaonline.org/sierra-club

The project activity involves marketing, distributing, and financing improved cookstove and solar lighting systems, for low-income households and microentrepreneurs in India. Future sales of solar lighting systems may happen in any state but within the geographic boundary of the PoA i.e. the country of India. However, it will be ensured at all times that the threshold for SSC projects is not exceeded and the PoA eligibility criteria are met.

These products provide clean energy for cooking and renewable energy for lighting. The cookstoves distributed under the VPA replaces traditional cookstoves thereby reducing the amount of fuelwood used for cooking in the baseline by households and thus reducing GHG emissions corresponding to the fuelwood saving by the project activity. The solar lighting systems replace kerosene-based lamps in households, which would have resulted in GHG emissions due to burning of fossil fuel i.e. kerosene.

The program is a voluntary initiative coordinated by Micro Energy Credits Corporation Private Limited (MEC), the CME of the PoA, and implemented by MEC's Partner Organizations (PO). The improved cookstove are implemented by Shri Kshetra Dharmasthala Rural Development Project (SKDRDP)[2] and solar lighting system are implemented by Shri Kshetra Dharmasthala Rural Development Project (SKDRDP), Asirvad Microfinance Limited, CEDAR Retail Private Limited (ESAF), Simpa Networks (Simpa) and Bandhan Creations Pvt. Ltd. (Bandhan).

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

[2] skdrdpindia.org

The goal of the VPA is to use carbon finance to enable installations of solar lanterns, and improved cook stoves in India.

A.2. Location of project

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VPA19- GS11503

a. Host Party (ies) - India

b. Region/State/Province –. For solar lighting systems, the States included are Bihar (BH), Chhattisgarh (CG), Goa (GOA), Gujarat (GJ), Jharkhand (JK), Karnataka (KA), Kerala (KL), Madhya Pradesh (MP), Maharashtra (MH), Odisha (OD), Punjab (PJ), Rajasthan (RJ), Tamil Nadu (TN), Uttar Pradesh (UP) and West Bengal (WB) and several regions within those states are included. For improved cookstoves, sales were made in Karnataka (KA) and several regions within this State.

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.

VPA21- GS11501

a. Host Party (ies) - India

b. Region/State/Province – For solar lighting systems, the States included are Assam (AS), Bihar (BH), Chandigarh (CH), Chhattisgarh (CG), Goa (GOA), Gujarat (GJ), Jharkhand (JK), Karnataka (KA), Kerala (KL), Madhya Pradesh (MP), Maharashtra (MH), Odisha (OD), Punjab (PJ), Rajasthan (RJ), Tamil Nadu (TN), Tripura (TR), Uttar Pradesh (UP) and West Bengal (WB) and several regions within the States.. For improved cookstoves, sales were made in Karnataka and several regions within this State.

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

VPA24- GS11498

a. Host Party (ies) - India

b. Region/State/Province – Both solar lighting system and improved cookstoves are disseminated in the state of Karnataka and several regions within this state.

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

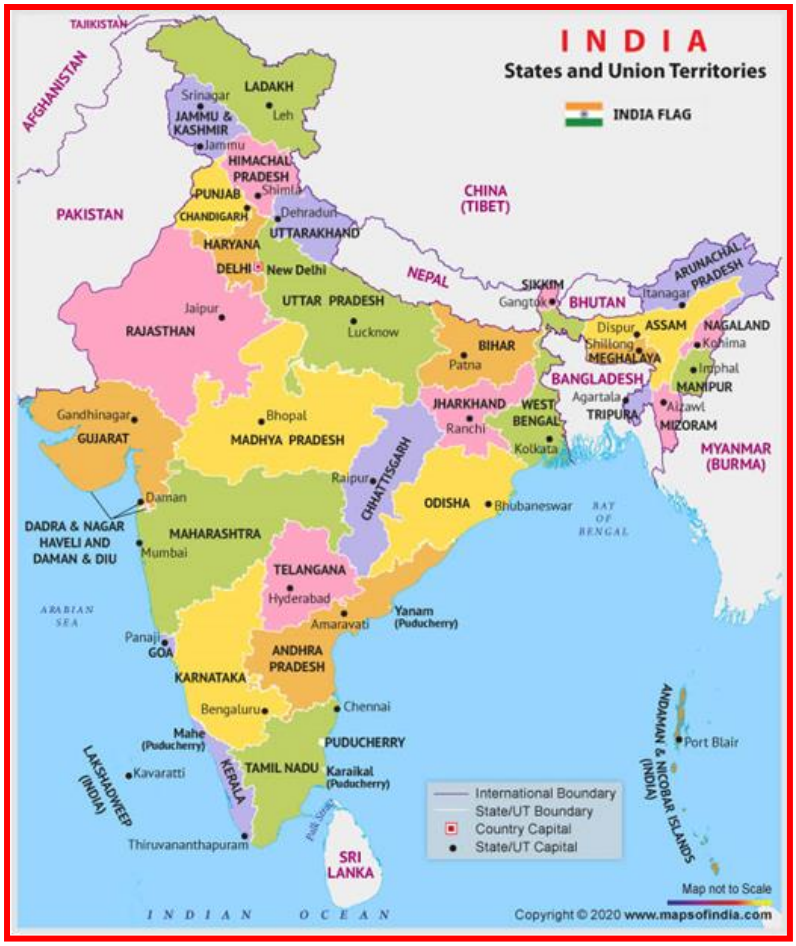
d. Physical/Geographic location – The exact location (address) of each CEP is captured in the Credit Tracker Platform and can be verified.

VPA26- GS11496

a. Host Party (ies) - India
b. Region/State/Province – Both solar lighting system and improved cookstoves are disseminated in the state of Karnataka and several regions within this state. 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 14) [3]

Improved Cookstove: Technologies and Practices to Displace Decentralized Thermal Energy Consumption (TPDDTEC), version 3.1[4]

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	GS4GG Eligible Crediting End Date[5]
GS11503	21/06/2019	20/06/2024	20/06/2034
GS11501	21/06/2019	20/06/2024	20/06/2034
GS11498	30/11/2019	29/11/2024	29/11/2034
GS11496	30/11/2019	29/11/2024	29/11/2034

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

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There are four VPAs part of this batch. All the below VPAs are financed by Clear Sky Partners LLC as part of the Korean ETS program:

VPA GS ID	VPA Title
GS11503	Micro Energy Credits PoA – CPA 19- Clear Sky Partners
GS11501	Micro Energy Credits PoA – CPA 21- Clear Sky Partners

[3] AMS I.A version 14.0
[4] TPDDTEC version 3.1

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

GS11498	Micro Energy Credits PoA – CPA 24-Clear Sky Partners
GS11496	Micro Energy Credits PoA – CPA 26-Clear Sky Partners

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 VPAs 19, 21, 24 and 26 (VPA GS ID: GS11503, GS11501, GS11498, GS11496). Clear Sky Partners LLC will provide a subsidy to make Improved Cook stoves (ICS) and Solar lighting systems (SLS) affordable to households. Clear Sky Partners LLC will also provide for the operation & maintenance costs of ICS and SLS, and finance the costs associated with the distribution of the ICS and SLS and education to the clients, to enable the VPA to operate in a financially sustainable condition.

VPA19 - GS ID: GS11503

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), 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 improved cook stoves for low income households and microentrepreneurs For improved cookstoves, Karnataka is included. For solar lights, the State of Bihar (BH), Chhattisgarh (CG), Goa (GOA), Gujarat (GJ), Jharkhand (JK), Karnataka (KA), Kerala (KL), Madhya Pradesh (MP), Maharashtra (MH), Odisha (OD), Punjab (PJ), Rajasthan (RJ), Tamil Nadu (TN), Uttar Pradesh (UP) and West Bengal (WB) are included. These products provide renewable energy for lighting and efficient energy for cooking. The total number of units implemented under this VPA till date is:

Improved cookstoves – 21,000
Solar Lighting systems – 40,164

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

Improved Cookstove:
The Improved Cookstove model implemented under this VPA is the Grameen Greenway Jumbo Stove (GJS).

Technical specifications are as follows –

Grameen Greenway Jumbo Stove (GJS):
Stove Body Size: 12.4'' x 10.6'' x 11.6''
Net weight: 5 kg
Average life span under standard use conditions: 5 years
The rated thermal efficiency is 31.17%

Solar Lighting Systems

1. PLT3F1HLS
Luminosity – 3400 lumens
Lighting Wattage – 40 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

2. PLT6HLS
Luminosity – 2150 lumens
Lighting Wattage – 25 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

3. CL2LT2HLS
Luminosity – 1650 lumens
Lighting Wattage – 19 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

4. PL2LT6F1HLS
Luminosity – 4750 lumens

Lighting Wattage – 57 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

5. PLT4HLS
Luminosity – 1700 lumens
Lighting Wattage – 20 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

6. CL1LT1F1HLS
Luminosity – 650 lumens
Lighting Wattage – 7 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

7. SKDLT3
Luminosity – 1350 lumens
Lighting Wattage – 15 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

8. PL1LT3HLS
Luminosity – 2750 lumens
Lighting Wattage – 33 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

9. CL1LT2HLS
Luminosity – 1100 lumens
Lighting Wattage – 12 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

10. CL1LT1HLS

Luminosity – 650 lumens
Lighting Wattage – 7 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

11 CL2HLS
Luminosity – 400 lumens
Lighting Wattage – 4 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

12. CL3LT1HLS2
Luminosity – 1050 lumens
Lighting Wattage – 11 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

13. PL1LT3F1HLS
Luminosity – 1900 lumens
Lighting Wattage – 22 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

14. SB2HLS
Luminosity – 1050 lumens
Lighting Wattage – 12 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

15. CLT2F1HLS Luminosity – 1250 lumens
Lighting Wattage – 15 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

16. PL1LT3F1HLS2

Luminosity – 3750 lumens
Lighting Wattage – 45 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

17. CLT2HLS
Luminosity – 1250 lumens
Lighting Wattage – 15 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

18. CL3LT1HLS
Luminosity – 1050 lumens
Lighting Wattage – 11 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

19. PL1LT5HLS
Luminosity – 1900 lumens
Lighting Wattage – 22 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

20. CLT1HLS
Luminosity – 450 lumens
Lighting Wattage – 5 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

21. PL1LT3F2HLS
Luminosity – 1250 lumens
Lighting Wattage – 15 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

22. PL2LT8F2HLS
Luminosity – 6950 lumens
Lighting Wattage – 85 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

23. Jugnu Lightbox L2005
Luminosity: 200 lumens
Light Wattage: 1.8 Watt
Average Lifetime: Minimum 5 years

24. RAL Duron Mitva MS 16C
Luminosity – 80 lumens
Lighting Wattage – 0.8 Watt
Average Lifetime of product (in years) – 5

25. RAL Duron Mitva MST 952A
Luminosity- 400 lumen
Light Wattage: 2 Watt
Average Lifetime –5years

26. Greenlight Planet Pico Plus (Sunking pico plus)
Luminosity – 50 lumens
Lighting Wattage – 0.28 Watt
Average Lifetime of product (in years) –5

27. Greenlight Planet Boom (Sunking Boom)
Luminosity - 160 lumens
Lighting Wattage – 3 watt
Average Lifetime of product (in years) –5

28. Greenlight Planet Home Lighting System (Sunking HLS)
Luminosity: 400 lumens
Light Wattage: 2.64 watt
Average Lifetime: Minimum 5 years

29. Glosolar Mini HLS
Luminosity – 400 lumens
Lighting Wattage – 2.5 Watt
Average Lifetime of product (in years) –5

30. Greenlight Planet ProX (Sunking ProX)
Luminosity – 175 lumens
Lighting Wattage – 1.093 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 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 improved cookstoves under this VPA are implemented from 21/06/2019 to 31/12/2019. The solar lighting systems under this VPA are implemented from 22/07/2019 to 20/08/2020.
2. Commissioning – 21,000 Improved cookstoves are distributed till the end of monitoring period under this VPA. 40,164 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.

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 69,441 tCO_2e.

VPA 21 - GS ID: GS11501

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), CEDAR (ESAF), Asirvad Microfinance Ltd. (Asirvad), Simpa Network (Simpa) and Nakshi (Bandhan) 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 PO's 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 improved cook stoves for low income households and microentrepreneurs For improved cookstoves, Karnataka is included. For solar lights, the State of Assam(AS), Bihar(BH), Chandigarh(CD), Chhattisgarh(CG), Goa(GA), Gujarat(GJ), Jharkhand (JK), Karnataka(KA), Kerala(KL), Madhya Pradesh(MP), Maharashtra(MH), Odisha(OD), Punjab(PB), Rajasthan(RJ), Tamil Nadu(TN), Tripura (TR), Uttar

Pradesh(UP) and West Bengal(WB) are included .These products provide renewable energy for lighting and efficient energy for cooking. The total number of units implemented under this VPA till date is:

Improved cookstoves –22,000
Solar Lighting systems – 136,182

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

Improved Cookstove:
The Improved Cookstove model implemented under this VPA are Grameen Greenway Jumbo Stove (GJS) and Grameen Greenway Smart Stove (GSSV3)

Technical specifications are as follows –
Grameen Greenway Jumbo Stove (GJS):
Stove Body Size: 12.4'' x 10.6'' x 11.6''
Net weight: 5 kg
Average life span under standard use conditions: 5 years
The rated thermal efficiency is 31.17%

Solar Lighting Systems

1. Spark Pro Ujala
Luminosity – 1320 lumens
Lighting Wattage – 3 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

2. Spark Pro breeze
Luminosity – 990 lumens
Lighting Wattage – 3 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

3. Greenlight Planet Home Lighting System 120 (Sunking HLS120)
Luminosity: 590 lumens
Light Wattage: 5.28 Watt
Average Lifetime –5years

4. Greenlight Planet Home Lighting System (Sunking HLS)
Luminosity: 400 lumens
Light Wattage: 2.64 Watt

Average Lifetime: Minimum 5 years

5. Greenlight Planet Pro 200 (Sunking Pro 200)
Luminosity - 200 lumens
Lighting Wattage – 1.25 watt
Average Lifetime of product (in years) –5

6. SK1510
Luminosity – 2000 lumens
Lighting Wattage – 5 Watt
Average Lifetime of product (in years) –5

7. SK1520
Luminosity – 4000 lumens
Lighting Wattage – 5 Watt
Average Lifetime of product (in years) –5

8. SK1530
Luminosity – 6000 lumens
Lighting Wattage – 10 Watt
Average Lifetime of product (in years) –5

9. SP 315
Luminosity – 5400 lumens
Lighting Wattage – 4 Watt
Average Lifetime of product (in years) –5

10. SP Breeze
Luminosity –1008 lumen
Lighting Wattage – 3 Watt
Average Lifetime of product (in years) –5

11. SP 100
Luminosity – 1800 lumens
Lighting Wattage – 2 Watt
Average Lifetime of product (in years) –5

12. SP200
Luminosity – 3600 lumens
Lighting Wattage – 4 Watt
Average Lifetime of product (in years) –5

13. SP Inverter 200
Luminosity – 2700 lumens
Lighting Wattage – 3 Watt
Average Lifetime of product (in years) –5

14. Greenlight Planet Pro 400 (Sunking Pro400)
Luminosity – 400 lumens
Lighting Wattage – 5.5 Watt
Average Lifetime of product (in years) – 5

15. Greenlight Planet Boom (Sunking Boom)
Luminosity: 160 lumens
Light Wattage: 3 Watt
Average Lifetime –5years

16. Power80
Luminosity: 1008 lumens
Light Wattage: 3 Watt
Average Lifetime –5years

17. Ujala Breeze
Luminosity – 1400 lumens
Lighting Wattage – 2 Watt
Average Lifetime of product (in years) –5

18. Ujala 2.0
Luminosity – 1980 lumens
Lighting Wattage – 3 Watt
Average Lifetime of product (in years) –5

19. Sunveter1530
Luminosity – 4200 lumens
Lighting Wattage – 7 Watt
Average Lifetime of product (in years) –5

20. RAL Duron Mitva MS 16C
Luminosity – 80 lumens
Lighting Wattage – 0.8 Watt
Average Lifetime of product (in years) – 5

21. RAL Duron Mitva MST 952A
Light Wattage: 2 Watt
Luminosity- 400 lumen
Average Lifetime –5years

22. Greenlight Planet Pico Plus (Sunking pico plus)
Luminosity – 50 lumens
Lighting Wattage – 0.28 Watt
Average Lifetime of product (in years) –5

23. Spark Pro
Luminosity – 1800 lumens

Lighting Wattage – 2 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

24. Jugnu Lightbox L2005
Luminosity – 200 lumens
Lighting Wattage – 1.8 Watt
Average Lifetime of product (in years) –5

25. Mini HLS
Luminosity – 400 lumens
Lighting Wattage – 2.5 Watt
Average Lifetime of product (in years) –5

26. Greenlight Planet Pro-2 (Sunking Pro-2)
Luminosity – 150 lumens
Lighting Wattage – 3 Watt
Average Lifetime of product (in years) –5

27. Greenlight Planet ProX (Sunking ProX)
Luminosity – 175 lumens
Lighting Wattage – 1.093 Watt
Average Lifetime of product (in years) –5

28. Phoenix 120
Luminosity – 672 lumens
Lighting Wattage – 3 Watt
Average Lifetime of product (in years) –5

29. Power Plus
Luminosity – 1080 lumens
Lighting Wattage – 3 Watt
Average Lifetime of product (in years) –5

30. SK 1540
Luminosity – 11200 lumens
Lighting Wattage – 80 Watt
Average Lifetime of product (in years) –5

31. SK Mini
Luminosity – 5600 lumens
Lighting Wattage – 40 Watt
Average Lifetime of product (in years) –5

32. SP 50

Luminosity – 1008 lumens
Lighting Wattage – 3 Watt
Average Lifetime of product (in years) –5

33. Magic TV
Luminosity – 672 lumens
Lighting Wattage – 3 Watt
Average Lifetime of product (in years) –5

34. Greenlight Planet Home Lighting System 120 Plus (Sunking HLS120 Plus)
Luminosity: 900 lumens
Light Wattage:6.3 Watt
Average Lifetime –5years

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 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 –

4. Construction/Implementation date – The improved cookstoves under this VPA are implemented from 21/06/2019 to 11/01/2020. The solar lighting systems under this VPA are implemented from 21/06/2019 to 31/12/2020.
5. Commissioning –22,000 Improved cookstoves are distributed till the end of monitoring period under this VPA. 136,182 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.
6. 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.

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 103,884 tCO_2e.

VPA24 - GS ID: GS11498

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) 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 PO 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 improved cook stoves for low income households and microentrepreneurs For improved cookstoves and solar lights, the State of Karnataka (KA) is included. These products provide renewable energy for lighting and efficient energy for cooking. The total number of units implemented under this VPA till date is:

Improved cookstoves – 21,000
Solar Lighting systems – 237

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

Improved Cookstove:
The Improved Cookstove model implemented under this VPA is Grameen Greenway Jumbo Stove (GJS).

Technical specifications are as follows –

Grameen Jumbo Stove (GJS) –
Stove Body Size – 12.4" x 10.6" x 11.6"
Net weight: 5 kg
Life span under standard use conditions: 5 years
The rated thermal efficiency is 31.17%

Solar Lighting Systems

1. CL1LT2HLS
Luminosity – 1100 lumen
Lighting Wattage – 12 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

2. CL1LT1HLS
Luminosity – 650 lumen
Lighting Wattage – 7 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

3. CL2HLS
Luminosity – 400 lumen
Lighting Wattage – 4 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

4. CL2LT2HLS
Luminosity – 1650 lumen
Lighting Wattage – 19 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

5. CL3LT1HLS
Luminosity – 1050 lumen
Lighting Wattage – 11 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

6. SKDLT3
Luminosity – 1350 lumen
Lighting Wattage – 15 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

7. PL1LT5HLS
Luminosity – 1900 lumen
Lighting Wattage – 22 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

8. CLT2F1HLS
Luminosity – 1250 lumen
Lighting Wattage – 15 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years

Electronics – 5 years

9. CLT2HLS
Luminosity – 1250 lumen
Lighting Wattage – 15 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

10. PL1LT3F1HLS
Luminosity – 1900 lumen
Lighting Wattage – 22 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

11. PLT3F1HLS
Luminosity – 3400 lumen
Lighting Wattage – 40 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

12. CL2LT2HLS2
Luminosity – 1650 lumen
Lighting Wattage – 19 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

13. PL1LT4HLS
Luminosity – 2350 lumen
Lighting Wattage – 27 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

14. PL2LT4HLS
Luminosity – 2550 lumen
Lighting Wattage – 29 Watt
Average Lifetime of product (in years) –
Module – 15 years

Battery – 8 years
Electronics – 5 years

15. PLT4F1HLS
Luminosity – 2150 lumen
Lighting Wattage – 25 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 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 –

7. Construction/Implementation date – The improved cookstoves under this VPA are implemented from 01/01/2020 to 20/02/2020. The solar lighting systems under this VPA are implemented from 30/11/2019 to 19/06/2020.
8. Commissioning – 21,000 Improved cookstoves are distributed till the end of monitoring period under this VPA. 237 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.
9. 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.

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 63,254 tCO_2e.

VPA26- GS ID: GS11496

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) 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 PO 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 improved cook stoves for low income households and microentrepreneurs For improved cookstoves and solar lights, the State of Karnataka(KA) is included .These products provide renewable energy for lighting and efficient energy for cooking. The total number of units implemented under this VPA till date is:

Improved cookstoves – 20,124
Solar Lighting systems – 175

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

Improved Cookstove:
The Improved Cookstove model implemented under this VPA is Grameen Greenway Jumbo Stove (GJS).

Technical specifications are as follows –

Grameen Jumbo Stove (GJS) –
Stove Body Size – 12.4" x 10.6" x 11.6"
Net weight: 5 kg
Life span under standard use conditions: 5 years
The rated thermal efficiency is 31.17%

Solar Lighting Systems

1. CL1LT2HLS
Luminosity – 1100 lumen
Lighting Wattage – 12 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

2. CL1LT1HLS
Luminosity – 650 lumen
Lighting Wattage – 7 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

3. CL2HLS
Luminosity – 400 lumen

Lighting Wattage – 4 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

4. CL2LT2HLS
Luminosity – 1650 lumen
Lighting Wattage – 19 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

5. CLT1HLS
Luminosity – 450 lumen
Lighting Wattage – 5 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

6. SKDLT3
Luminosity – 1350 lumen
Lighting Wattage – 15 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

7. PL1LT3HLS
Luminosity – 1900 lumen
Lighting Wattage – 22 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

8. CLT2HLS
Luminosity – 1250 lumen
Lighting Wattage – 15 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

9. PL1LT5HLS

Luminosity – 1900 lumen
Lighting Wattage – 22 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

10. CLT2F1HLS
Luminosity – 1250 lumen
Lighting Wattage – 15 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

11. CL2LT2HLS2
Luminosity – 1650 lumen
Lighting Wattage – 19 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

12. PL1LT4HLS
Luminosity – 2350 lumen
Lighting Wattage – 19 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

13. PL2LT4HLS
Luminosity – 2550 lumen
Lighting Wattage – 29 Watt
Average Lifetime of product (in years) –
Module – 15 years
Battery – 8 years
Electronics – 5 years

14. PLT4F1HLS
Luminosity – 2150 lumen
Lighting Wattage – 25 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 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 improved cookstoves under this VPA are implemented from 07/01/2020 to 23/03/2020. The solar lighting systems under this CPA are implemented from 30/11/2019 to 24/06/2020..
2. Commissioning – 20,124 Improved cookstoves are distributed till the end of monitoring period under this VPA. 175 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.

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 55,288 tCO_2e.

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
Asirvad	Customer identification number	Loan Proposal Identification Number
ESAF	Customer identification number	Loan Proposal Identification Number
Bandhan	Customer identification number	Loan Proposal Identification Number
Simpa	Customer identification number	Loan Proposal 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

>>

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 - project fuel consumption ($p_{p,y}$) or efficiency of ICS , number of ICS still operating ($U_{p,y}$), 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. project KPT) 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 fuel consumption for cooking. Fuelwood was not supplied separately but a small bundle from household stock was separated and provided to households to be used for the KPT. Each day enumerator or field staff would visit the household between 6-7 a.m. before the first meal is cooked. All enumerators would carry weighing scale and moisture meter to take the measurements. The data would be collected directly in the Microsoft excel.

CME has defined the project technology "use" versus "non-use" to determine who should be considered eligible for crediting. The criteria for defining the same has been listed below:

1. User is defined as someone who uses the stove daily. The same shall be captured in the survey questionnaire.
2. To define the use and non-use of project technology, CME has included questions in the survey questionnaire such as when was the stove last used, frequency of use, how many meals are prepared in a day.
3. Physical verification of the stove is conducted to check if the combustion chamber is intact and grate is available or not. Surveyor shall also observe physically that the stove feels warm and presence of ash in the stove.
4. Users will be asked questions on use of the baseline stove, how many meals prepared, presence or absence of the baseline stove.
5. CME shall refer to usage and project survey and Kitchen Performance Tests (KPTs) to determine if the stove was in use or not.

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.

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

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

Improved Cookstoves:

Data/parameter	$P_{b,y}$
Unit	kg/household-day
Description	Quantity of fuel that is consumed in baseline scenario b during year y
Source of data	Baseline FT or default baseline fuelwood consumption
Value(s) applied	**VPA Number** / **State** / **Value** VPA 19 / Karnataka / 6.944 VPA 21 / Karnataka / 7.040 Kerala / 7.077 VPA 24 / Karnataka / 7.130 VPA 26 / Karnataka / 7.051 Kerala / 7.042
Choice of data or Measurement methods and procedures	Baseline Study in section B.4 of the VPA-DD.
Purpose of data	For baseline emission calculations
Additional comment	-

Data/parameter	$EF_{b,i,CO2}$
Unit	tCO_2/t_{fuel}
Description	CO_2 emission factor arising from use of fuel type *i* in baseline scenario
Source of data	Methodology default, Other fuels: IPCC defaults
Value(s) applied	Fuelwood: 112 tCO2/TJ
Choice of data or Measurement methods and procedures	Default IPCC values have been applied
Purpose of data	For baseline emission calculations
Additional comment	-

<table>
<tr><td>Data/parameter</td><td>$EF_{b,i,nonCO2}$</td></tr>
<tr><td>Unit</td><td>$tCO_2/tfuel$</td></tr>
<tr><td>Description</td><td>Non-CO_2 emission factor arising from use of fuel type i in baseline scenario</td></tr>
<tr><td>Source of data</td><td>IPCC default value as per 2006 IPCC Guidelines for National Greenhouse Gas Inventories volume 2, chapter 2 (Table 2.9)</td></tr>
<tr><td>Value(s) applied</td><td>Wood: 37.25 tCO2e/TJ</td></tr>
<tr><td>Choice of data or Measurement methods and procedures</td><td>Methodology defaults have been applied for wood
<table>
<tr><th>Parameter</th><th>Value</th><th>Average</th><th>Units</th><th>Source</th></tr>
<tr><td>EF_wood_CH4</td><td>258 – 2190</td><td>1224</td><td>kgCO2/TJ</td><td></td></tr>
<tr><td>EF_wood_N2O</td><td>4 – 18.5</td><td>11.25</td><td>KgCO2/TJ</td><td></td></tr>
<tr><td>GWP CH4</td><td>28</td><td></td><td>tCO2/TJ</td><td>AR5</td></tr>
<tr><td>GWP N2O</td><td>265</td><td></td><td>tCO2/TJ</td><td>AR5</td></tr>
<tr><td>$EF_{b,fuel\ non\text{-}CO2}$</td><td></td><td>37.25</td><td>tCO2/TJ</td><td></td></tr>
</table></td></tr>
<tr><td>Purpose of data</td><td>For baseline emission calculations</td></tr>
<tr><td>Additional comment</td><td>-</td></tr>
</table>

<table>
<tr><td>Data/parameter</td><td>$EF_{p,i,CO2}$</td></tr>
<tr><td>Unit</td><td>tCO_2/t_{fuel}</td></tr>
<tr><td>Description</td><td>CO_2 emission factor arising from use of fuel type i in project scenario</td></tr>
<tr><td>Source of data</td><td>Wood: Methodology default,
Other fuels: IPCC default</td></tr>
<tr><td>Value(s) applied</td><td>Fuelwood / wood chips: 112 tCO2/TJ</td></tr>
<tr><td>Choice of data or Measurement methods and procedures</td><td>Default IPCC values have been applied</td></tr>
<tr><td>Purpose of data</td><td>For project emission calculations</td></tr>
<tr><td>Additional comment</td><td>-</td></tr>
</table>

<table>
<tr><td>Data/parameter</td><td>$EF_{p,i,nonCO2}$</td></tr>
<tr><td>Unit</td><td>tCO_2/TJ</td></tr>
<tr><td>Description</td><td>Non-CO_2 emission factor arising from use of fuel type i used in project scenario</td></tr>
</table>

Source of data	IPCC default value as per 2006 IPCC Guidelines for National Greenhouse Gas Inventories volume 2, chapter 2 (Table 2.9)
Value(s) applied	37.25 tCO2e/TJ (AR5 GWP)
Choice of data or Measurement methods and procedures	Default methodology values have been applied for wood
Purpose of data	For project emission calculations
Additional comment	-

Parameter	Value	Average	Units	Source
EF_wood_CH4	258 – 2190	1224	kgCO2/TJ	
EF_wood_N2O	4 – 18.5	11.25	KgCO2/TJ	
GWP CH4	28		tCO2/TJ	AR5
GWP N2O	265		tCO2/TJ	AR5
$EF_{b,fuel\ non\text{-}CO2}$		**37.25**	**tCO2/TJ**	

Data/parameter	$NCV_{b,i}$
Unit	TJ/tonne
Description	Net calorific value of the fuel type *i* used in the baseline
Source of data	Methodology default: Wood Other fuels: - IPCC defaults
Value(s) applied	Fuelwood / wood chips: 0.0156 TJ/tonnes
Choice of data or Measurement methods and procedures	Default IPCC values have been applied
Purpose of data	For baseline emission calculations
Additional comment	-

Data/parameter	$NCV_{p,i}$
Unit	TJ/tonne
Description	Net calorific value of the fuel type *i* used in the project scenario
Source of data	Wood: Methodology default
Value(s) applied	Fuelwood / wood chips: 0.0156 TJ/tonnes
Choice of data or Measurement methods and procedures	Default IPCC values for wood / wood waste are applied.
Purpose of data	For project emission calculations

Additional comment	-

Data/parameter	$f_{NRB,b,i,y}$
Unit	Fractional non-renewability
Description	Non-renewability status of woody biomass fuel type *i* that can be established as non-renewable during year y
Source of data	Calculation as per CDM methodology Tool 30 version 3.0
Value(s) applied	See table below
Choice of data or Measurement methods and procedures	N.A.
Purpose of data	For emission reduction calculations
Additional comment	-

VPA Number	State	Value
VPA19	Karnataka	0.860
VPA21	Karnataka Kerala	0.860 0.874
VPA24	Karnataka	0.860
VPA26	Karnataka Kerala	0.860 0.874

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 tCO2/TJ.
Purpose of data	Calculation of baseline emissions
Additional comment	The parameter is fixed for the entire crediting period.

Data/parameter	z
Unit	n/a
Description	Standard normal for a confidence interval of 90%
Source of data	Köhler, Schachtel, Voleske, 2002; Biostatistik, Springer Verlag Berlin Heidelberg; Tafel 2, p. 279
Value(s) applied	1.290, 1.645; 1.96
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

>>

Improved Cookstoves

SDG 13

Data / Parameter	$P_{p,y}$
Unit	kg/household-day
Description	Quantity of fuel that is consumed in project scenario p during year y
Source of data	Project KPT
Value(s) applied	**VPA** / **Model/State** / **Values** VPA19 / Jumbo/KA / 2.57 VPA21 / Jumbo/KA / 2.57 VPA24 / Jumbo/KA / 2.73 VPA26 / Jumbo/KA / 3.04
Measurement methods and procedures	Project KPT has been conducted
Monitoring frequency	Updated every two years
QA/QC procedures	The equipment used for testing is externally calibrated or newly purchased at the time of use so measurements are done with the necessary guarantees.
Purpose of data	To calculate baseline emissions
Additional comment	Project fuel consumption using KPT has been conducted twice – wet season (July-Aug 2021) and dry season (Jan-Feb 2022) to take into account seasonal variation in wood consumption. The higher value (wet season) has been used for calculation of emission reduction as a measure of conservativeness.

Data / Parameter	$U_{p,y}$
Unit	Fraction (or %)
Description	Usage rate in project scenario p during year y
Source of data	Annual usage survey (KS)
Value(s) applied	**VPA** / **Model/State** / **Values** VPA19 / Jumbo/KA / 0.82 VPA21 / Jumbo/KA / 0.84 VPA24 / Jumbo/KA / 0.90 VPA26 / Jumbo/KA / 0.90
Measurement methods and procedures	Sampling surveys (physical) has been conducted to record the continued operation of project devices. The usage rate has been calculated for each age (simple random sampling to be applied as applicable)
Monitoring frequency	Annual

QA/QC procedures	CME has provided guidance and training to enumerators for conducting surveys to meet specific requirement of the methodology, if any. The value obtained has been tested to determine if the desired precision was met.
Purpose of data	To calculate baseline emissions
Additional comment	A single usage parameter is weighted to be representative of the quantity of project technologies of each age being credited in a given project scenario.

Data / Parameter	Policy for encouraging discontinuation of baseline stove
Unit	--
Description	Measures adopted to encourage use of project technology / discontinue baseline technology
Source of data	Internal records
Value(s) applied	-
Measurement methods and procedures	The end user training events were monitored to demonstrate that the users have been informed about use of project stoves and phase out of baseline stove.
Monitoring frequency	Updated every two years
QA/QC procedures	Transparent data analysis and reporting.
Purpose of data	To calculate baseline emissions
Additional comment	-

Data / Parameter	$N_{p,y}$
Unit	Project technologies credited (Number)
Description	Technologies in the project Database for project scenario p through year y
Source of data	Total sales record
Value(s) applied	**VPA** / **Model/State** / **Values** VPA19 / Jumbo/KA / 21,000 VPA21 / Jumbo/KA / 22,000 VPA24 / Jumbo/KA / 21,000 VPA26 / Jumbo/KA / 20,124
Measurement methods and procedures	Number of stoves listed in the Monitoring Database
Monitoring frequency	Continuous
QA/QC procedures	Values can be cross checked by sales records.
Purpose of data	To calculate baseline emissions

Additional comment	For sampling and monitoring purposes, the end user database which is a subset of the number of installations reported in the QPR has been used.

Data / Parameter	$LE_{p,y}$
Unit	tCO_2e per year
Description	Leakage in project scenario p during year y
Source of data	Baseline and monitoring surveys for Leakage assessment
Value(s) applied	**VPA** / **Model/State** / **Values**: VPA19 / Jumbo/KA / 0; VPA21 / Jumbo/KA / 0; VPA24 / Jumbo/KA / 0; VPA26 / Jumbo/KA / 0
Measurement methods and procedures	Qualitative / quantitative assessment
Monitoring frequency	Every two years
QA/QC procedures	N.A.
Purpose of data	For calculation of leakage emissions
Additional comment	-

Solar Lighting System

SDG 13

Data / Parameter	In
Unit	Lumens
Description	Lumen output of each solar lamp *n* deployed as part of project activity
Source of data	Table 4, 2021 value
Value(s) applied	1. PLT3F1HLS: 140.54 (Manufacturer's specification gives lumen output of 3400 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 2. PLT6HLS: 140.54 (Manufacturer's specification gives lumen output of 2150 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 3. CL2LT2HLS: 140.54 (Manufacturer's specification gives lumen output of 1650 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions)

	4. PL2LT6F1HLS: 140.54 (Manufacturer's specification gives lumen output of 4750 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 5. PLT4HLS: 140.54 (Manufacturer's specification gives lumen output of 1700 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 6. CL1LT1F1HLS: 140.54 (Manufacturer's specification gives lumen output of 650 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 7. SKDLT3: 140.54 (Manufacturer's specification gives lumen output of 1350 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 8. PL1LT3HLS: 140.54 (Manufacturer's specification gives lumen output of 2750 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 9. CL1LT2HLS: 140.54 (Manufacturer's specification gives lumen output of 1100 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 10. CL1LT1HLS: 140.54 (Manufacturer's specification gives lumen output of 650 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 11. CL2HLS: 140.54 (Manufacturer's specification gives lumen output of 400 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 12. CL3LT1HLS2: 140.54 (Manufacturer's specification gives lumen output of 1050 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 13. PL1LT3F1HLS: 140.54 (Manufacturer's specification gives lumen output of 1900 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 14. CLT2F1HLS: 140.54 (Manufacturer's specification gives lumen output of 1250 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 15. PL1LT3F1HLS2: 140.54 (Manufacturer's specification gives lumen output of 3750 Lumens, however, the lumen

	value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 16. CLT2HLS: 140.54 (Manufacturer's specification gives lumen output of 1250 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 17. CL3LT1HLS: 140.54 (Manufacturer's specification gives lumen output of 1050 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 18. PL1LT5HLS: 140.54 (Manufacturer's specification gives lumen output of 1900 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 19. CLT1HLS: 140.54 (Manufacturer's specification gives lumen output of 450 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 20. PL1LT3F2HLS: 140.54 (Manufacturer's specification gives lumen output of 1250 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 21. PL2LT8F2HLS: 140.54 (Manufacturer's specification gives lumen output of 6950 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 22. SB2HLS: 140.54 (Manufacturer's specification gives lumen output of 1050 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 23. Glosolar miniHLS: 140.54 (Manufacturer's specification gives lumen output of 400 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 24. Jugnu Light box L2005: 140.54 (Manufacturer's specification gives lumen output of 200 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 25. Sunking Boom: 140.54 (Manufacturer's specification gives lumen output of 160 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 26. Sunking HLS: 140.54 (Manufacturer's specification gives lumen output of 400 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions)

	27. Sunking Pico Plus: 50 Lumens (Manufacturer's specification gives lumen output of 50 Lumens which is less than the lumen cap of 140.54 , hence 50 lumen is applied to calculate emission reductions) 28. RAL Mitva Duron MS-16C: 80 (Manufacturer's specification gives lumen output of 80 Lumens which is less than the lumen cap of 140.54, hence 80 lumen is applied to calculate emission reductions) 29. RAL Mitva Duron MST 952A: 140.54 (Manufacturer's specification gives lumen output of 400 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions). 30. Sunking Pro-X: 140.54 (Manufacturer's specification gives lumen output of 175 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 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 will be 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, Numbers
SKDRDP	
PLT3F1HLS	251
PLT6HLS	60
CL2LT2HLS	2668
PL2LT6F1HLS	26
PLT4HLS	23
CL1LT1F1HLS	45
SKDLT3	3119
PL1LT3HLS	140
CL1LT2HLS	4915
CL1LT1HLS	2311
CL2HLS	1087
CL3LT1HLS2	276
PL1LT3F1HLS	121
CLT2F1HLS	491
PL1LT3F1HLS2	156
CLT2HLS	1025
CL3LT1HLS	272
PL1LT5HLS	35
CLT1HLS	187
PL1LT3F2HLS	60
PL2LT8F2HLS	21
SB2HLS	2
Asirvad	
Glosolar Mini HLS(BH)	249
Glosolar Mini HLS(JK)	153
Glosolar Mini HLS(CG)	19

	Glosolar Mini HLS(MP)	4,526
	Glosolar Mini HLS(MH)	1
	Glosolar Mini HLS(OD)	182
	Glosolar Mini HLS(PJ)	1451
	Glosolar Mini HLS(RJ)	24
	Glosolar Mini HLS(TN)	161
	Jugnu Lightbox L2005(BH)	2,131
	Jugnu Lightbox L2005(GJ)	69
	Jugnu Lightbox L2005(JK)	1
	Jugnu Lightbox L2005(KL)	2
	Jugnu Lightbox L2005(OD)	2
	Jugnu Lightbox L2005(TN)	1
	Jugnu Lightbox L2005(UP)	264
	Jugnu Lightbox L2005(WB)	517
	Sunking Boom(GA)	6
	Sunking Boom(KA)	781
	Sunking Pro-X(KA)	5
	ESAF	
	RAL Duron Mitva MS 16 C(KL)	3939
	RAL Duron Mitva MST 952A(KL)	1509
	Sunking Boom(KL)	637
	Sunking Boom(CG)	223
	Sunking Boom(TN)	105
	Sunking Boom(MH)	10
	Sunking HLS(KL)	667
	Sunking HLS(MH)	21
	Sunking HLS(TN)	19
	Sunking HLS(BH)	2
	Sunking Pico Plus(KL)	5139
	Sunking Pico Plus(MH)	2
	Sunking Pico Plus(TN)	42
	Sunking Pico Plus(BH)	1
	Sunking Pico Plus(CG)	12
	Total sales	**40,164**
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	22 Models of SKDRDP, 4 models of Asirvad and 5 models of ESAF 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	

Model	Value
SKDRDP	
PLT3F1HLS	358
PLT6HLS	353
CL2LT2HLS	363
PL2LT6F1HLS	351
PLT4HLS	365
CL1LT1F1HLS	349
SKDLT3	364
PL1LT3HLS	357
CL1LT2HLS	364
CL1LT1HLS	363
CL2HLS	362
CL3LT1HLS2	360
PL1LT3F1HLS	359
CLT2F1HLS	361
PL1LT3F1HLS2	360
CLT2HLS	363
CL3LT1HLS	358
PL1LT5HLS	365
CLT1HLS	361
PL1LT3F2HLS	359
PL2LT8F2HLS	365
SB2HLS	365
Asirvad	
Glosolar Mini HLS(BH)	359
Glosolar Mini HLS(JK)	358
Glosolar Mini HLS(CG)	365
Glosolar Mini HLS(MP)	364
Glosolar Mini HLS(MH)	365
Glosolar Mini HLS(OD)	361
Glosolar Mini HLS(PJ)	363
Glosolar Mini HLS(RJ)	365
Glosolar Mini HLS(TN)	358

	Jugnu Lightbox L2005(BH)	364
	Jugnu Lightbox L2005(GJ)	365
	Jugnu Lightbox L2005(JK)	365
	Jugnu Lightbox L2005(KL)	365
	Jugnu Lightbox L2005(OD)	365
	Jugnu Lightbox L2005(TN)	365
	Jugnu Lightbox L2005(UP)	362
	Jugnu Lightbox L2005(WB)	363
	Sunking Boom(GA)	365
	Sunking Boom(KA)	363
	Sunking Pro-X(KA)	365
	ESAF	
	RAL Duron Mitva MS 16 C(KL)	364
	RAL Duron Mitva MST 952A(KL)	364
	Sunking Boom(KL)	363
	Sunking Boom(CG)	362
	Sunking Boom(TN)	358
	Sunking Boom(MH)	365
	Sunking HLS(KL)	363
	Sunking HLS(MH)	365
	Sunking HLS(TN)	365
	Sunking HLS(BH)	365
	Sunking Pico Plus(KL)	364
	Sunking Pico Plus(MH)	365
	Sunking Pico Plus(TN)	356
	Sunking Pico Plus(BH)	365
	Sunking Pico Plus(CG)	365
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 will be used to calculate total days of operation in period v. For products sold/installed prior to period v, $d_{i,a,v}$ will 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 – SKDRDP, ESAF and Asirvad.	
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* in checked sample group gi,v not operational in period *v*
Source of data	Monitoring partner, Credit Tracker
Value(s) applied	

Model	**Value (%)**
SKDRDP	
PLT3F1HLS	1.99
PLT6HLS	3.33
CL2LT2HLS	0.49
PL2LT6F1HLS	3.85
PLT4HLS	0.00
CL1LT1F1HLS	4.44
SKDLT3	0.32
PL1LT3HLS	2.14
CL1LT2HLS	0.31
CL1LT1HLS	0.56
CL2HLS	0.92
CL3LT1HLS2	1.45

PL1LT3F1HLS	1.65
CLT2F1HLS	1.22
PL1LT3F1HLS2	1.28
CLT2HLS	0.49
CL3LT1HLS	1.84
PL1LT5HLS	0.00
CLT1HLS	1.07
PL1LT3F2HLS	1.67
PL2LT8F2HLS	0.00
SB2HLS	0.00
Asirvad	
Glosolar Mini HLS(BH)	1.61
Glosolar Mini HLS(JK)	1.96
Glosolar Mini HLS(CG)	0.00
Glosolar Mini HLS(MP)	0.18
Glosolar Mini HLS(MH)	0.00
Glosolar Mini HLS(OD)	1.10
Glosolar Mini HLS(PJ)	0.41
Glosolar Mini HLS(RJ)	0.00
Glosolar Mini HLS(TN)	1.86
Jugnu Lightbox L2005(BH)	0.38
Jugnu Lightbox L2005(GJ)	0.00
Jugnu Lightbox L2005(JK)	0.00
Jugnu Lightbox L2005(KL)	0.00
Jugnu Lightbox L2005(OD)	0.00
Jugnu Lightbox L2005(TN)	0.00
Jugnu Lightbox L2005(UP)	0.76
Jugnu Lightbox L2005(WB)	0.58
Sunking Boom(GA)	0.00
Sunking Boom(KA)	0.51
Sunking Pro-X(KA)	0.00
ESAF	
RAL Duron Mitva MS 16 C(KL)	0.23
RAL Duron Mitva MST 952A(KL)	0.40
Sunking Boom(KL)	0.63
Sunking Boom(CG)	0.90
Sunking Boom(TN)	1.90
Sunking Boom(MH)	0.00
Sunking HLS(KL)	0.60
Sunking HLS(MH)	0.00
Sunking HLS(TN)	0.00
Sunking HLS(BH)	0.00
Sunking Pico Plus(KL)	0.19
Sunking Pico Plus(MH)	0.00

	Sunking Pico Plus(TN) 2.38 Sunking Pico Plus(BH) 0.00 Sunking Pico Plus(CG) 0.00
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	

Model	**Value (%)**
SKDRDP	
PLT3F1HLS	94.66
PLT6HLS	92.37
CL2LT2HLS	98.14
PL2LT6F1HLS	91.29
PLT4HLS	100.00
CL1LT1F1HLS	90.70
SKDLT3	98.57
PL1LT3HLS	94.39
CL1LT2HLS	98.61
CL1LT1HLS	97.61
CL2HLS	96.75
CL3LT1HLS2	95.69
PL1LT3F1HLS	95.29
CLT2F1HLS	96.15
PL1LT3F1HLS2	96.07
CLT2HLS	97.84
CL3LT1HLS	94.94
PL1LT5HLS	100.00
CLT1HLS	96.47
PL1LT3F2HLS	95.27
PL2LT8F2HLS	100.00
SB2HLS	100.00
Asirvad	
Glosolar Mini HLS(BH)	95.33
Glosolar Mini HLS(JK)	94.66
Glosolar Mini HLS(CG)	100.00
Glosolar Mini HLS(MP)	98.99
Glosolar Mini HLS(MH)	100.00
Glosolar Mini HLS(OD)	96.40
Glosolar Mini HLS(PJ)	98.31
Glosolar Mini HLS(RJ)	100.00
Glosolar Mini HLS(TN)	94.90
Jugnu Lightbox L2005(BH)	98.42
Jugnu Lightbox L2005(GJ)	100.00

	Jugnu Lightbox L2005(JK)	100.00
	Jugnu Lightbox L2005(KL)	100.00
	Jugnu Lightbox L2005(OD)	100.00
	Jugnu Lightbox L2005(TN)	100.00
	Jugnu Lightbox L2005(UP)	97.17
	Jugnu Lightbox L2005(WB)	97.60
	Sunking Boom(GA)	100.00
	Sunking Boom(KA)	98.08
	Sunking Pro-X(KA)	100.00
	ESAF	
	RAL Duron Mitva MS 16 C(KL)	98.83
	RAL Duron Mitva MST 952A(KL)	98.33
	Sunking Boom(KL)	97.48
	Sunking Boom(CG)	96.84
	Sunking Boom(TN)	94.82
	Sunking Boom(MH)	100.00
	Sunking HLS(KL)	97.55
	Sunking HLS(MH)	100.00
	Sunking HLS(TN)	100.00
	Sunking HLS(BH)	100.00
	Sunking Pico Plus(KL)	98.94
	Sunking Pico Plus(MH)	100.00
	Sunking Pico Plus(TN)	93.97
	Sunking Pico Plus(BH)	100.00
	Sunking Pico Plus(CG)	100.00
Measurement methods and procedures	The value is calculated using the recorded value for $LFR_{i,v}$ – $CF_{i,v,LFR} = 1 - (LFR_{i,v} + z * \sqrt{\frac{LFRi,v * (1 - LFRi,v))}{ni,v,total}}$	
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	$n_{,i,v,total}$
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
SKDRDP	
PLT3F1HLS	29
PLT6HLS	29
CL2LT2HLS	43
PL2LT6F1HLS	26
PLT4HLS	23
CL1LT1F1HLS	30
SKDLT3	43
PL1LT3HLS	29
CL1LT2HLS	43
CL1LT1HLS	28
CL2HLS	28
CL3LT1HLS2	29
PL1LT3F1HLS	29
CLT2F1HLS	29
PL1LT3F1HLS2	30
CLT2HLS	29
CL3LT1HLS	29
PL1LT5HLS	30
CLT1HLS	29
PL1LT3F2HLS	29
PL2LT8F2HLS	21
SB2HLS	2
Asirvad	
Glosolar Mini HLS(BH)	28
Glosolar Mini HLS(JK)	28
Glosolar Mini HLS(CG)	19
Glosolar Mini HLS(MP)	42
Glosolar Mini HLS(MH)	1
Glosolar Mini HLS(OD)	29
Glosolar Mini HLS(PJ)	42
Glosolar Mini HLS(RJ)	24
Glosolar Mini HLS(TN)	29
Jugnu Lightbox L2005(BH)	43
Jugnu Lightbox L2005(GJ)	30
Jugnu Lightbox L2005(JK)	1
Jugnu Lightbox L2005(KL)	2
Jugnu Lightbox L2005(OD)	2
Jugnu Lightbox L2005(TN)	1
Jugnu Lightbox L2005(UP)	29
Jugnu Lightbox L2005(WB)	29
Sunking Boom(GA)	6
Sunking Boom(KA)	43

	Sunking Pro-X(KA)	5
	ESAF	
	RAL Duron Mitva MS 16 C(KL)	43
	RAL Duron Mitva MST 952A(KL)	41
	Sunking Boom(KL)	29
	Sunking Boom(CG)	29
	Sunking Boom(TN)	29
	Sunking Boom(MH)	10
	Sunking HLS(KL)	29
	Sunking HLS(MH)	21
	Sunking HLS(TN)	19
	Sunking HLS(BH)	2
	Sunking Pico Plus(KL)	43
	Sunking Pico Plus(MH)	2
	Sunking Pico Plus(TN)	29
	Sunking Pico Plus(BH)	1
	Sunking Pico Plus(CG)	12
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%
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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Data / Parameter	ln
Unit	Lumens
Description	Lumen output of each solar lamp *n* deployed as part of project activity
Source of data	Table 4, 2021 value
Value(s) applied	1. Power 80 – 140.54 (Manufacturer's specification gives lumen output of 1008 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions)

	2. SK-1510 – 140.54 (Manufacturer's specification gives lumen output of 2000 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 3. SK-1520 – 140.54 (Manufacturer's specification gives lumen output of 4000 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 4. SK-1530 – 140.54 (Manufacturer's specification gives lumen output of 6000 Lumens which is more than the cap of 140.54 and hence 140.54 is applied to calculate emission reductions) 5. SP315 – 140.54 (Manufacturer's specification gives lumen output of 5400 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 6. SP Breeze– 140.54 (Manufacturer's specification gives lumen output of 1008 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 7. SP Inverter 200– 140.54 (Manufacturer's specification gives lumen output of 2700 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 8. SP100 - 140.54 (Manufacturer's specification gives lumen output of 1800 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 9. SP200 – 140.54 (Manufacturer's specification gives lumen output of 3600 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions). 10. Spark Pro – 140.54 (Manufacturer's specification gives lumen output of 1800 Lumens, however, the lumen

	value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 11. Spark Pro Breeze – 140.54 (Manufacturer's specification gives lumen output of 990 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 12. Spark Pro Ujala – 140.54 (Manufacturer's specification gives lumen output of 1320 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 13. Sunverter 1530 – 140.54 (Manufacturer's specification gives lumen output of 4200 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 14. Ujala 2.0 – 140.54 (Manufacturer's specification gives lumen output of 1980 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 15. Ujala Breeze – 140.54 (Manufacturer's specification gives lumen output of 1400 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 16. Greenlight Planet Pro200 (Sunking Pro200) – 140.54 (Manufacturer's specification gives lumen output of 200 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 17. Greenlight Planet Pico Plus (Sunking Pico Plus) – 50 (Manufacturer's specification gives lumen output of 50 Lumens which is lesser than lumen cap of 140.54 and hence 50 is applied to calculate emission reductions) 18. RAL Duron Mitva MS 16C – 80 (Manufacturer's specification gives lumen output of 80 Lumens which is lesser than lumen cap of 140.54 and hence 80 is applied to calculate emission reductions)

	19. RAL Duron Mitva MST 952A – 140.54 (Manufacturer's specification gives lumen output of 400 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 20. Greenlight Planet Boom (Sunking Boom) – 140.54 (Manufacturer's specification gives lumen output of 160 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 21. Greenlight Planet Home Lighting System (Sunking HLS) – 140.54 (Manufacturer's specification gives lumen output of 400 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 22. Greenlight Planet Pro 400 (Sunking Pro400) – 140.54 (Manufacturer's specification gives lumen output of 400 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 23. Greenlight Planet Home Lighting System 120 (Sunking HLS 120) – 140.54 (Manufacturer's specification gives lumen output of 590 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 24. Jugnu Lightbox L2005 – 140.54 (Manufacturer's specification gives lumen output of 200 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 25. Mini HLS – 140.54 (Manufacturer's specification gives lumen output of 400 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 26. Greenlight Planet Pro-2 (Sunking Pro-2) – 140.54 (Manufacturer's specification gives lumen output of 150 Lumens, however, the lumen value is capped at 140.54

	and hence 140.54 is applied to calculate emission reductions) 27. Greenlight Planet Pro X (Sunking ProX) – 140.54 (Manufacturer's specification gives lumen output of 175 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 28. Phoenix 120 – 140.54 (Manufacturer's specification gives lumen output of 672 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 29. Power Plus – 140.54 (Manufacturer's specification gives lumen output of 1080 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 30. SK 1540 – 140.54 (Manufacturer's specification gives lumen output of 11200 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 31. SK Mini – 140.54 (Manufacturer's specification gives lumen output of 5600 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 32. SP 50 – 140.54 (Manufacturer's specification gives lumen output of 1008 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 33. Magic TV– 140.54 (Manufacturer's specification gives lumen output of 1008 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 34. Greenlight Planet Home Lighting System 120 Plus (Sunking HLS 120 Plus) - 140.54 (Manufacturer's specification gives lumen output of 900 Lumens,

	however, the lumen value is capped at 140.54 and hence 140.54 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 will be 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	

Product Model	Total Sales
Bandhan	
Sunking Boom (AS)	1,757
Sunking Boom (BH)	3,542
Sunking Boom (JK)	823
Sunking Boom (OD)	796
Sunking Boom (TR)	293
Sunking Boom (WB)	12
Sunking HLS (AS)	3
Sunking HLS (BH)	952
Sunking HLS (JK)	219
Sunking HLS (OD)	5
Sunking HLS 120 (AS)	4,377
Sunking HLS 120 (BH)	957
Sunking HLS 120 (JK)	221
Sunking HLS 120 (OD)	790
Sunking HLS 120 (TR)	1,272
Sunking HLS 120 (WB)	8
Sunking Pro 400 (AS)	3,970
Sunking Pro 400 (BH)	6,431
Sunking Pro 400 (JK)	1,072
Sunking Pro 400 (OD)	63
Sunking Pro 400 (TR)	1,119
Sunking Pro 2 (AS)	4
Sunking HLS120 Plus (AS)	4
Sunking HLS120 Plus (BH)	1
ESAF	
RAL Duron Mitva MS16C (KL)	11,462
RAL Duron Mitva MST952A (KL)	5,800
RAL Duron Mitva MST952A (TN)	247
Sunking Boom (CG)	42
Sunking Boom (KL)	4,509

Sunking Boom (MP)	2
Sunking Boom (MH)	2
Sunking HLS (KL)	290
Sunking pico plus (KL)	14,700
Sunking pico plus (TN)	106
Sunking Pro 200 (KL)	448
Simpa	
Power 80 (BH)	32
Power 80 (OD)	70
Power 80 (UP)	198
SK-1510 (UP)	1
SK-1520 (BH)	9
SK-1520 (OD)	11
SK-1520 (UP)	207
SK-1530 (BH)	84
SK-1530 (OD)	962
SK-1530 (UP)	100
SP 315 (BH)	60
SP 315 (OD)	889
SP 315 (UP)	262
SP Breeze (OD)	227
SP Inverter 200 (BH)	14
SP Inverter 200 (OD)	43
SP100 (BH)	140
SP100 (OD)	14
SP100 (UP)	993
SP200 (BH)	20
SP200 (OD)	118
SP200 (UP)	1861
Spark Pro (BH)	183
Spark Pro (OD)	122
Spark Pro (UP)	1083
Spark Pro Breeze (BH)	497
Spark Pro Breeze (OD)	688

Spark Pro Breeze (UP)	159
Spark Pro Ujala (OD)	9
Sunverter1530 (BH)	8
Sunverter1530 (OD)	404
Sunverter1530 (UP)	7
Ujala2.0 (BH)	150
Ujala2.0 (OD)	72
Ujala2.0 (UP)	1
Ujala Breeze (BH)	36
Ujala Breeze (OD)	291
Phoenix 120(UP)	5
Power Plus(BH)	16
Power Plus(OD)	117
Power Plus(UP)	21
SK 1540(UP)	12
SK Mini(UP)	48
SP 50(BH)	24
SP 50(OD)	13
SP50(UP)	4
Magic TV (OD)	23
Magic TV (UP)	13
Asirvad	
Jugnu Lightbox L2005 (BH)	29,914
Jugnu Lightbox L2005 (CGH)	9
Jugnu Lightbox L2005 (GJ)	1,089
Jugnu Lightbox L2005 (KL)	1,955
Jugnu Lightbox L2005 (PJ)	30
Jugnu Lightbox L2005 (TN)	784
Jugnu Lightbox L2005 (TR)	115
Jugnu Lightbox L2005 (UP)	2,697
Jugnu Lightbox L2005 (WB)	5,539
Mini HLS (BH)	2,937
Mini HLS (CG)	8
Mini HLS (JK)	567

	<table><tr><td>Mini HLS (MH)</td><td>6</td></tr><tr><td>Mini HLS (OD)</td><td>398</td></tr><tr><td>Mini HLS (RJ)</td><td>20</td></tr><tr><td>Mini HLS (TN)</td><td>7,796</td></tr><tr><td>Mini HLS (UP)</td><td>21</td></tr><tr><td>Sunking Boom (CG)</td><td>6</td></tr><tr><td>Sunking Boom (Goa)</td><td>45</td></tr><tr><td>Sunking Boom (KA)</td><td>5,592</td></tr><tr><td>Sunking Boom (TN)</td><td>4</td></tr><tr><td>Sunking Pro-X (KA)</td><td>30</td></tr><tr><td>Total</td><td>136,182</td></tr></table>
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 models of Simpa, 6 models of ESAF, 6 models of Bandhan and 4 models of Asirvad are distributed under this VPA for this monitoring period.

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>Product Model</th><th>Values</th></tr><tr><td>Bandhan</td><td></td></tr><tr><td>Sunking Boom (AS)</td><td>359</td></tr><tr><td>Sunking Boom (BH)</td><td>360</td></tr><tr><td>Sunking Boom (JK)</td><td>358</td></tr><tr><td>Sunking Boom (OD)</td><td>359</td></tr><tr><td>Sunking Boom (TR)</td><td>358</td></tr></table>

Sunking Boom (WB)	365
Sunking HLS (AS)	365
Sunking HLS (BH)	359
Sunking HLS (JK)	357
Sunking HLS (OD)	365
Sunking HLS 120 (AS)	358
Sunking HLS 120 (BH)	359
Sunking HLS 120 (JK)	357
Sunking HLS 120 (OD)	358
Sunking HLS 120 (TR)	360
Sunking HLS 120 (WB)	365
Sunking Pro 400 (AS)	355
Sunking Pro 400 (BH)	359
Sunking Pro 400 (JK)	355
Sunking Pro 400 (OD)	359
Sunking Pro 400 (TR)	355
Sunking Pro 2 (AS)	365
Sunking HLS120 Plus (AS)	365
Sunking HLS120 Plus (BH)	365
ESAF	
RAL Duron Mitva MS16C (KL)	360
RAL Duron Mitva MST952A (KL)	360
RAL Duron Mitva MST952A (TN)	364
Sunking Boom (CG)	356
Sunking Boom (KL)	358
Sunking Boom (MP)	365
Sunking Boom (MH)	365
Sunking HLS (KL)	359
Sunking pico plus (KL)	361
Sunking pico plus (TN)	355
Sunking Pro 200 (KL)	354
Simpa	
Power 80 (BH)	365
Power 80 (OD)	360

Power 80 (UP)	356
SK-1510 (UP)	365
SK-1520 (BH)	365
SK-1520 (OD)	365
SK-1520 (UP)	361
SK-1530 (BH)	361
SK-1530 (OD)	361
SK-1530 (UP)	361
SP 315 (BH)	359
SP 315 (OD)	360
SP 315 (UP)	358
SP Breeze (OD)	357
SP Inverter 200 (BH)	365
SP Inverter 200 (OD)	357
SP100 (BH)	361
SP100 (OD)	365
SP100 (UP)	359
SP200 (BH)	365
SP200 (OD)	350
SP200 (UP)	359
Spark Pro (BH)	359
Spark Pro (OD)	359
Spark Pro (UP)	359
Spark Pro Breeze (BH)	359
Spark Pro Breeze (OD)	358
Spark Pro Breeze (UP)	363
Spark Pro Ujala (OD)	365
Sunverter1530 (BH)	365
Sunverter1530 (OD)	358
Sunverter1530 (UP)	365
Ujala2.0 (BH)	363
Ujala2.0 (OD)	360
Ujala2.0 (UP)	365
Ujala Breeze (BH)	355

Ujala Breeze (OD)	359
Phoenix 120(UP)	365
Power Plus(BH)	365
Power Plus(OD)	362
Power Plus(UP)	365
SK 1540(UP)	365
SK Mini(UP)	357
SP 50(BH)	365
SP 50(OD)	365
SP50(UP)	365
Magic TV (OD)	365
Magic TV (UP)	365
Asirvad	
Jugnu Lightbox L2005 (BH)	362
Jugnu Lightbox L2005 (CGH)	365
Jugnu Lightbox L2005 (GJ)	359
Jugnu Lightbox L2005 (KL)	359
Jugnu Lightbox L2005 (PJ)	353
Jugnu Lightbox L2005 (TN)	358
Jugnu Lightbox L2005 (TR)	362
Jugnu Lightbox L2005 (UP)	359
Jugnu Lightbox L2005 (WB)	359
Mini HLS (BH)	358
Mini HLS (CG)	365
Mini HLS (JK)	359
Mini HLS (MH)	365
Mini HLS (OD)	354
Mini HLS (RJ)	347
Mini HLS (TN)	360
Mini HLS (UP)	348
Sunking Boom (CG)	365
Sunking Boom (Goa)	357
Sunking Boom (KA)	359
Sunking Boom (TN)	365

	Sunking Pro-X (KA)	353
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 – Asirvad, Simpa, ESAF and Bandhan	
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* in checked sample group gi,v not operational in period *v*
Source of data	Monitoring partner, Credit Tracker
Value(s) applied	

Product Model	Values (%)
Bandhan	
Sunking Boom (AS)	1.59
Sunking Boom (BH)	1.41
Sunking Boom (JK)	1.82
Sunking Boom (OD)	1.51
Sunking Boom (TR)	2.05
Sunking Boom (WB)	0.00
Sunking HLS (AS)	0.00
Sunking HLS (BH)	1.68
Sunking HLS (JK)	2.28
Sunking HLS (OD)	0.00
Sunking HLS 120 (AS)	2.01
Sunking HLS 120 (BH)	1.78
Sunking HLS 120 (JK)	2.26
Sunking HLS 120 (OD)	2.03
Sunking HLS 120 (TR)	1.42
Sunking HLS 120 (WB)	0.00
Sunking Pro 400 (AS)	1.79
Sunking Pro 400 (BH)	1.59
Sunking Pro 400 (JK)	2.80
Sunking Pro 400 (OD)	1.59
Sunking Pro 400 (TR)	2.06
Sunking Pro 2 (AS)	0.00
Sunking HLS120 Plus (AS)	0.00
Sunking HLS120 Plus (BH)	0.00
ESAF	
RAL Duron Mitva MS16C (KL)	1.42
RAL Duron Mitva MST952A (KL)	1.26

RAL Duron Mitva MST952A (TN)	0.40
Sunking Boom (CG)	2.38
Sunking Boom (KL)	2.02
Sunking Boom (MP)	0.00
Sunking Boom (MH)	0.00
Sunking HLS (KL)	1.72
Sunking pico plus (KL)	1.07
Sunking pico plus (TN)	2.83
Sunking Pro 200 (KL)	2.90
Simpa	
Power 80 (BH)	0.00
Power 80 (OD)	1.43
Power 80 (UP)	2.53
SK-1510 (UP)	0.00
SK-1520 (BH)	0.00
SK-1520 (OD)	0.00
SK-1520 (UP)	0.97
SK-1530 (BH)	1.19
SK-1530 (OD)	1.14
SK-1530 (UP)	1.00
SP 315 (BH)	1.67
SP 315 (OD)	1.24
SP 315 (UP)	1.91
SP Breeze (OD)	2.20
SP Inverter 200 (BH)	0.00
SP Inverter 200 (OD)	2.33
SP100 (BH)	0.71
SP100 (OD)	0.00
SP100 (UP)	1.71
SP200 (BH)	0.00
SP200 (OD)	1.69
SP200 (UP)	1.67
Spark Pro (BH)	1.64

Spark Pro (OD)	1.64
Spark Pro (UP)	1.57
Spark Pro Breeze (BH)	1.61
Spark Pro Breeze (OD)	1.89
Spark Pro Breeze (UP)	0.63
Spark Pro Ujala (OD)	0.00
Sunverter1530 (BH)	0.00
Sunverter1530 (OD)	1.98
Sunverter1530 (UP)	0.00
Ujala2.0 (BH)	0.67
Ujala2.0 (OD)	1.39
Ujala2.0 (UP)	1.29
Ujala Breeze (BH)	2.78
Ujala Breeze (OD)	1.72
Phoenix 120(UP)	0.00
Power Plus(BH)	0.00
Power Plus(OD)	0.85
Power Plus(UP)	0.00
SK 1540(UP)	0.00
SK Mini(UP)	2.08
SP 50(BH)	0.00
SP 50(OD)	0.00
SP50(UP)	0.00
Magic TV (OD)	0.00
Magic TV (UP)	0.00
Asirvad	
Jugnu Lightbox L2005 (BH)	0.89
Jugnu Lightbox L2005 (CGH)	0.00
Jugnu Lightbox L2005 (GJ)	1.74
Jugnu Lightbox L2005 (KL)	1.74
Jugnu Lightbox L2005 (PJ)	3.33
Jugnu Lightbox L2005 (TN)	1.91
Jugnu Lightbox L2005 (TR)	0.87
Jugnu Lightbox L2005 (UP)	1.74

Jugnu Lightbox L2005 (WB)	1.55
Mini HLS (BH)	1.80
Mini HLS (CG)	0.00
Mini HLS (JK)	1.76
Mini HLS (MH)	0.00
Mini HLS (OD)	3.02
Mini HLS (RJ)	0.00
Mini HLS (TN)	1.31
Mini HLS (UP)	0.00
Sunking Boom (CG)	0.00
Sunking Boom (Goa)	2.22
Sunking Boom (KA)	1.71
Sunking Boom (TN)	0.00
Sunking Pro-X (KA)	3.33

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	

Product Model	**Values (%)**
Bandhan	
Sunking Boom (AS)	96
Sunking Boom (BH)	96.29
Sunking Boom (JK)	95.51
Sunking Boom (OD)	96.10
Sunking Boom (TR)	95.03
Sunking Boom (WB)	100
Sunking HLS (AS)	95.25
Sunking HLS (BH)	95.82
Sunking HLS (JK)	94.55
Sunking HLS (OD)	100
Sunking HLS 120 (AS)	95.29
Sunking HLS 120 (BH)	95.65

Sunking HLS 120 (JK)	94.63
Sunking HLS 120 (OD)	95.20
Sunking HLS 120 (TR)	96.26
Sunking HLS 120 (WB)	100
Sunking Pro 400 (AS)	95.63
Sunking Pro 400 (BH)	96.06
Sunking Pro 400 (JK)	93.99
Sunking Pro 400 (OD)	95.42
Sunking Pro 400 (TR)	95.25
Sunking Pro 2 (AS)	100
Sunking HLS120 Plus (AS)	100
Sunking HLS120 Plus (BH)	100
ESAF	
RAL Duron Mitva MS16C (KL)	96.33
RAL Duron Mitva MST952A (KL)	96.57
RAL Duron Mitva MST952A (TN)	98.28
Sunking Boom (CG)	93.97
Sunking Boom (KL)	95.22
Sunking Boom (MP)	100
Sunking Boom (MH)	100
Sunking HLS (KL)	95.62
Sunking pico plus (KL)	96.98
Sunking pico plus (TN)	93.39
Sunking Pro 200 (KL)	93.72
Simpa	
Power 80 (BH)	100
Power 80 (OD)	95.78
Power 80 (UP)	94.15
SK-1510 (UP)	100
SK-1520 (BH)	100
SK-1520 (OD)	100
SK-1520 (UP)	96.96
SK-1530 (BH)	96.26
SK-1530 (OD)	96.79

SK-1530 (UP)	96.73
SP 315 (BH)	95.32
SP 315 (OD)	96.56
SP 315 (UP)	95.27
SP Breeze (OD)	94.94
SP Inverter 200 (BH)	100
SP Inverter 200 (OD)	94.06
SP100 (BH)	97.45
SP100 (OD)	100
SP100 (UP)	95.74
SP200 (BH)	100
SP200 (OD)	95.36
SP200 (UP)	95.87
Spark Pro (BH)	95.59
Spark Pro (OD)	95.51
Spark Pro (UP)	96.38
Spark Pro Breeze (BH)	95.89
Spark Pro Breeze (OD)	95.46
Spark Pro Breeze (UP)	97.67
Spark Pro Ujala (OD)	100
Sunverter1530 (BH)	100
Sunverter1530 (OD)	95.25
Sunverter1530 (UP)	100
Ujala2.0 (BH)	97.56
Ujala2.0 (OD)	95.85
Ujala2.0 (UP)	100
Ujala Breeze (BH)	93.29
Ujala Breeze (OD)	95.63
Phoenix 120(UP)	100
Power Plus(BH)	100
Power Plus(OD)	97.08
Power Plus(UP)	100
SK 1540(UP)	100
SK Mini(UP)	94.50

SP 50(BH)	100
SP 50(OD)	100
SP50(UP)	100
Magic TV (OD)	100
Magic TV (UP)	100
Asirvad	
Jugnu Lightbox L2005 (BH)	97.31
Jugnu Lightbox L2005 (CGH)	100
Jugnu Lightbox L2005 (GJ)	95.71
Jugnu Lightbox L2005 (KL)	95.72
Jugnu Lightbox L2005 (PJ)	92.44
Jugnu Lightbox L2005 (TN)	95.36
Jugnu Lightbox L2005 (TR)	97.05
Jugnu Lightbox L2005 (UP)	95.74
Jugnu Lightbox L2005 (WB)	96.04
Mini HLS (BH)	96.64
Mini HLS (CG)	100
Mini HLS (JK)	95.58
Mini HLS (MH)	100
Mini HLS (OD)	93.50
Mini HLS (RJ)	100
Mini HLS (TN)	96.84
Mini HLS (UP)	100
Sunking Boom (CG)	100
Sunking Boom (Goa)	94.25
Sunking Boom (KA)	95.79
Sunking Boom (TN)	100
Sunking Pro-X (KA)	92.37

Measurement methods and procedures	The value is calculated using the recorded value for $LFR_{i,v}$ – $$CF_{i,v,LFR} = 1 - (LFR_{i,v} + z * \sqrt{\frac{LFRi,v * (1 - LFRi,v))}{ni,v,total}}$$
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	$n_{,i,v,total}$
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	

Product Model	**Values**
Bandhan	
Sunking Boom (AS)	45
Sunking Boom (BH)	44
Sunking Boom (JK)	42
Sunking Boom (OD)	43
Sunking Boom (TR)	39
Sunking Boom (WB)	12
Sunking HLS (AS)	3
Sunking HLS (BH)	44
Sunking HLS (JK)	37
Sunking HLS (OD)	5
Sunking HLS 120 (AS)	45
Sunking HLS 120 (BH)	44
Sunking HLS 120 (JK)	38
Sunking HLS 120 (OD)	43
Sunking HLS 120 (TR)	43
Sunking HLS 120 (WB)	8
Sunking Pro 400 (AS)	44
Sunking Pro 400 (BH)	47
Sunking Pro 400 (JK)	44
Sunking Pro 400 (OD)	29
Sunking Pro 400 (TR)	46
Sunking Pro 2 (AS)	4
Sunking HLS120 Plus (AS)	4
Sunking HLS120 Plus (BH)	1
ESAF	

RAL Duron Mitva MS16C (KL)	46
RAL Duron Mitva MST952A (KL)	44
RAL Duron Mitva MST952A (TN)	39
Sunking Boom (CG)	29
Sunking Boom (KL)	43
Sunking Boom (MP)	2
Sunking Boom (MH)	2
Sunking HLS (KL)	40
Sunking pico plus (KL)	46
Sunking pico plus (TN)	32
Sunking Pro 200 (KL)	41
Simpa	
Power 80 (BH)	30
Power 80 (OD)	30
Power 80 (UP)	37
SK-1510 (UP)	1
SK-1520 (BH)	9
SK-1520 (OD)	11
SK-1520 (UP)	37
SK-1530 (BH)	30
SK-1530 (OD)	44
SK-1530 (UP)	32
SP 315 (BH)	30
SP 315 (OD)	42
SP 315 (UP)	39
SP Breeze (OD)	44
SP Inverter 200 (BH)	14
SP Inverter 200 (OD)	29
SP100 (BH)	35
SP100 (OD)	14
SP100 (UP)	43
SP200 (BH)	20
SP200 (OD)	32
SP200 (UP)	45

Spark Pro (BH)	35
Spark Pro (OD)	33
Spark Pro (UP)	61
Spark Pro Breeze (BH)	43
Spark Pro Breeze (OD)	44
Spark Pro Breeze (UP)	36
Spark Pro Ujala (OD)	9
Sunverter1530 (BH)	8
Sunverter1530 (OD)	42
Sunverter1530 (UP)	7
Ujala2.0 (BH)	35
Ujala2.0 (OD)	30
Ujala2.0 (UP)	1
Ujala Breeze (BH)	29
Ujala Breeze (OD)	40
Phoenix 120(UP)	5
Power Plus(BH)	16
Power Plus(OD)	33
Power Plus(UP)	21
SK 1540(UP)	12
SK Mini(UP)	29
SP 50(BH)	13
SP 50(OD)	24
SP50(UP)	4
Magic TV (OD)	23
Magic TV (UP)	13
Asirvad	
Jugnu Lightbox L2005 (BH)	45
Jugnu Lightbox L2005 (CGH)	9
Jugnu Lightbox L2005 (GJ)	44
Jugnu Lightbox L2005 (KL)	44
Jugnu Lightbox L2005 (PJ)	30
Jugnu Lightbox L2005 (TN)	42
Jugnu Lightbox L2005 (TR)	33

	Jugnu Lightbox L2005 (UP)	45
	Jugnu Lightbox L2005 (WB)	44
	Mini HLS (BH)	45
	Mini HLS (CG)	8
	Mini HLS (JK)	41
	Mini HLS (MH)	6
	Mini HLS (OD)	40
	Mini HLS (RJ)	20
	Mini HLS (TN)	63
	Mini HLS (UP)	21
	Sunking Boom (CG)	6
	Sunking Boom (Goa)	29
	Sunking Boom (KA)	45
	Sunking Boom (TN)	4
	Sunking Pro-X (KA)	29
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%
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.

VPA24 – GS11498

SDG 13

Data / Parameter	ln
Unit	Lumens
Description	Lumen output of each solar lamp *n* deployed as part of project activity
Source of data	Table 4, 2021 value
Value(s) applied	1. CL1LT2HLS - 140.54 (Manufacturer's specification gives lumen output of 1100 Lumens, however, the lumen

	value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 2. CL1LT1HLS - 140.54 (Manufacturer's specification gives lumen output of 650 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 3. CL2HLS - 140.54 (Manufacturer's specification gives lumen output of 400 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 4. CL2LT2HLS - 140.54 (Manufacturer's specification gives lumen output of 1650 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 5. CL3LT1HLS - 140.54 (Manufacturer's specification gives lumen output of 1050 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 6. SKDLT3 - 140.54 (Manufacturer's specification gives lumen output of 1350 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 7. PL1LT5HLS - 140.54 (Manufacturer's specification gives lumen output of 1900 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 8. CLT2F1HLS - 140.54 (Manufacturer's specification gives lumen output of 1250 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 9. CLT2HLS - 140.54 (Manufacturer's specification gives lumen output of 1250 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 10. PL1LT3F1HLS - 140.54 (Manufacturer's specification gives lumen output of 1900 Lumens, however, the lumen value is capped at 140.54 and hence

	140.54 is applied to calculate emission reductions) 11. PLT3F1HLS - 140.54 (Manufacturer's specification gives lumen output of 3400 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 12. CL2LT2HLS2 - 140.54 (Manufacturer's specification gives lumen output of 1650 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 13. PL1LT4HLS - 140.54 (Manufacturer's specification gives lumen output of 2350 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 14. PL2LT4HLS -140.54 (Manufacturer's specification gives lumen output of 2550 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 15. PLT4F1HLS - 140.54 (Manufacturer's specification gives lumen output of 2150 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 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 will be 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	
Measurement methods and procedures	N.A.

Model	**Total Sales, Numbers**
CL1LT2HLS	22
CL1LT1HLS	9
CL2HLS	62
CL2LT2HLS	27
CL3LT1HLS	1
SKDLT3	57
PL1LT5HLS	1
CLT2F1HLS	7
CLT2HLS	1
PL1LT3F1HLS	1
PLT3F1HLS	2
CL2LT2HLS2	42
PL1LT4HLS	1
PL2LT4HLS	2
PLT4F1HLS	2
Total sales	**237**

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	A total of 15 models from SKDRDP are distributed under this VPA for this monitoring period.

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	

Model	Value
CL1LT2HLS	315
CL1LT1HLS	324
CL2HLS	341
CL2LT2HLS	338
CL3LT1HLS	365
SKDLT3	346
PL1LT5HLS	365
CLT2F1HLS	313
CLT2HLS	365
PL1LT3F1HLS	365
PLT3F1HLS	365
CL2LT2HLS2	339
PL1LT4HLS	365
PL2LT4HLS	365
PLT4F1HLS	365

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 will be used to calculate total days of operation in period v. For products sold/installed prior to period v, $d_{i,a,v}$ will 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 – 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* in checked sample group $g_{i,v}$ not operational in period *v*
Source of data	Monitoring partner, Credit Tracker
Value(s) applied	

Model	**Value (%)**
CL1LT2HLS	13.64
CL1LT1HLS	11.11
CL2HLS	6.45
CL2LT2HLS	7.41
CL3LT1HLS	0.00
SKDLT3	5.26

	PL1LT5HLS	0.00
	CLT2F1HLS	14.29
	CLT2HLS	0.00
	PL1LT3F1HLS	0.00
	PLT3F1HLS	0.00
	CL2LT2HLS2	7.14
	PL1LT4HLS	0.00
	PL2LT4HLS	0.00
	PLT4F1HLS	0.00
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	
Measurement methods and procedures	The value is calculated using the recorded value for $LFR_{i,v}$ – $$CF_{i,v,LFR} = 1 - (LFR_{i,v} + z * \sqrt{\frac{LFRi,v * (1 - LFRi,v)}{ni,v,total}})$$
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	-

Model	Value %
CL1LT2HLS	76.21
CL1LT1HLS	74.56
CL2HLS	87.45
CL2LT2HLS	85.97
CL3LT1HLS	100.00
SKDLT3	89.19
PL1LT5HLS	100.00
CLT2F1HLS	67.29
CLT2HLS	100.00
PL1LT3F1HLS	100.00
PLT3F1HLS	100.00
CL2LT2HLS2	86.46
PL1LT4HLS	100.00
PL2LT4HLS	100.00
PLT4F1HLS	100.00

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	
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

Model	Value
CL1LT2HLS	19
CL1LT1HLS	8
CL2HLS	27
CL2LT2HLS	26
CL3LT1HLS	1
SKDLT3	27
PL1LT5HLS	1
CLT2F1HLS	6
CLT2HLS	1
PL1LT3F1HLS	1
PLT3F1HLS	2
CL2LT2HLS2	27
PL1LT4HLS	1
PL2LT4HLS	2
PLT4F1HLS	2

	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%
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.

VPA26 – GS11496

SDG 13

Data / Parameter	In
Unit	Lumens
Description	Lumen output of each solar lamp *n* deployed as part of project activity
Source of data	Table 4, 2021 value

Value(s) applied	1. CL1LT2HLS - 140.54 (Manufacturer's specification gives lumen output of 1100 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 2. CL1LT1HLS - 140.54 (Manufacturer's specification gives lumen output of 650 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 3. CL2HLS - 140.54 (Manufacturer's specification gives lumen output of 400 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 4. CL2LT2HLS - 140.54 (Manufacturer's specification gives lumen output of 1650 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 5. CL3LT1HLS - 140.54 (Manufacturer's specification gives lumen output of 1050 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 6. SKDLT3 - 140.54 (Manufacturer's specification gives lumen output of 1350 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 7. PL1LT3F1HLS - 140.54 (Manufacturer's specification gives lumen output of 1900 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 8. CLT2HLS - 140.54 (Manufacturer's specification gives lumen output of 1250 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 9. CL2LT2HLS2 - 140.54 (Manufacturer's specification gives lumen output of 1650 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions)

	10. PL1LT4HLS - 140.54 (Manufacturer's specification gives lumen output of 2350 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 11. PL2LT4HLS -140.54 (Manufacturer's specification gives lumen output of 2550 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 is applied to calculate emission reductions) 12. PLT4F1HLS - 140.54 (Manufacturer's specification gives lumen output of 2150 Lumens, however, the lumen value is capped at 140.54 and hence 140.54 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 will be 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	
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

Model	**Total Sales, Numbers**
CL1LT2HLS	13
CL1LT1HLS	15
CL2HLS	52
CL2LT2HLS	3
CLT1HLS	4
CLT2HLS	1
PL1LT3HLS	1
SKDLT3	28
PL1LT5HLS	1
CLT2F1HLS	2
CL2LT2HLS2	51
PL1LT4HLS	1
PL2LT4HLS	2
PLT4F1HLS	1
Total	**175**

Additional comment	A total of 14 models are distributed under this VPA for this monitoring period.

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	

Model	**Value**
CL1LT2HLS	365
CL1LT1HLS	365
CL2HLS	358
CL2LT2HLS	365
CLT1HLS	365
CLT2HLS	365
PL1LT3HLS	365
SKDLT3	352
PL1LT5HLS	365
CLT2F1HLS	365
CL2LT2HLS2	358
PL1LT4HLS	365
PL2LT4HLS	365
PLT4F1HLS	365

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 – 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* in checked sample group gi,v not operational in period *v*
Source of data	Monitoring partner, Credit Tracker
Value(s) applied	

Model	**Value (%)**
CL1LT2HLS	0.00
CL1LT1HLS	0.00
CL2HLS	1.92
CL2LT2HLS	0.00
CLT1HLS	0.00
CLT2HLS	0.00
PL1LT3HLS	0.00
SKDLT3	3.57

	<table><tr><td>PL1LT5HLS</td><td>0.00</td></tr><tr><td>CLT2F1HLS</td><td>0.00</td></tr><tr><td>CL2LT2HLS2</td><td>1.96</td></tr><tr><td>PL1LT4HLS</td><td>0.00</td></tr><tr><td>PL2LT4HLS</td><td>0.00</td></tr><tr><td>PLT4F1HLS</td><td>0.00</td></tr></table>
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	

Model	Value (%)
CL1LT2HLS	100.00
CL1LT1HLS	100.00
CL2HLS	94.79
CL2LT2HLS	100.00
CLT1HLS	100.00
CLT2HLS	100.00
PL1LT3HLS	100.00
SKDLT3	91.82
PL1LT5HLS	100.00
CLT2F1HLS	100.00
CL2LT2HLS2	94.72
PL1LT4HLS	100.00
PL2LT4HLS	100.00
PLT4F1HLS	100.00

Measurement methods and procedures	The value is calculated using the recorded value for $LFR_{i,v}$ – $$CF_{i,v,LFR} = 1 - (LFR_{i,v} + z * \sqrt{\frac{LFRi,v * (1 - LFRi,v)}{ni,v,total}})$$
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	$n_{,i,v,total}$
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	
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

Model	Value
CL1LT2HLS	13
CL1LT1HLS	15
CL2HLS	29
CL2LT2HLS	3
CLT1HLS	4
CLT2HLS	1
PL1LT3HLS	1
SKDLT3	27
PL1LT5HLS	1
CLT2F1HLS	2
CL2LT2HLS2	29
PL1LT4HLS	1
PL2LT4HLS	2
PLT4F1HLS	1

	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%
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.

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

Data/Parameter	Value obtained in this monitoring period	Value obtained last monitoring period
$N_{p,y}$	VPA19- 21,000 VPA21- 22,000 VPA24- 21,000 VPA26- 20,124	VPA19- 21,000 VPA21- 22,000 VPA24- 21,000 VPA26- 20,124
$U_{p,y}$	VPA19- 0.82 VPA21- 0.85 VPA24- 0.90 VPA26- 0.90	VPA19- 0.85 VPA21- 0.87 VPA24- 0.98 VPA26- 0.98
$P_{p,y}$	VPA19- 0.00257 VPA21- 0.00257 VPA24- 0.00273 VPA26- 0.00304	-[6]
$N_{i,a}$	VPA19- 40,164 VPA21- 136,182 VPA24- 237 VPA26- 175	VPA19- 40,164 VPA21- 136,182 VPA24- 237 VPA26- 175
$LFR_{i,v}$	Refer to Section D.2	Refer to MR in CDM
$n_{i,v,total}$	Refer to Section D.2	Refer to MR in CDM
Ln	140.54	116.9
SDG 1	**ICS** VPA19- 21,000 VPA21- 22,000 VPA24- 21,000 VPA26- 20,124 **SLS** VPA19- 40,164 VPA21- 136,182 VPA24- 237	-

[6] This is due to change in methodology from AMS II.G to TPDDTEC

	VPA26- 175	
SDG 3	**ICS** VPA19- 82% VPA21- 84% VPA24- 90% VPA26- 90%	-
SDG 5	**ICS** VPA19- 82% VPA21- 84% VPA24- 90% VPA26- 90%	-
SDG 7	**ICS** VPA19- 17,220 VPA21- 18,450 VPA24- 18,900 VPA26- 18,112 **SLS** VPA19- 39,445 VPA21- 131,242 VPA24- 204 VPA26- 167	-
SDG 8	VPA19- 73 VPA21- 85 VPA24- 30 VPA26- 30	-

D.4. Implementation of sampling plan

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

Sampling plan was applied to all the following VPAs included in this issuance request: VPA19, VPA21, VPA24 and VPA26 values considered.

Description of implemented sampling design

As per the registered PoA-DD, CDM standard on "Sampling and surveys for CDM project activities and programme of activities" version 9.0 and TPDDTEC v3.1, the following sampling design was implemented for each 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 organization.

2) For each partner organization, where sales were made in more than 1 state, the population was further split into state wise sales. This was 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 all POs' in the VPA with solar lighting system sales. The pilot data results 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 CPA population is 300 with 60 lights of vintage 0-1 years, 100 of vintage 1-2 years and 140 of vintage 2-3 years, the selected samples were 6 for vintage 0-1 years, 10 for vintage 1-2 years and 14 for vintage 2-3 years for a sample size of 30.

5) The vintage analysis sheet is provided to the VVB including the approach for selecting samples based on vintage and a further demonstration of the vintage split reflected in the monitored samples. For e.g. table below shows the vintage split for Sarala d.light S100 with a total sample requirement of 89:

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**
d.light S100	West Bengal	89	0-1 (27/06/2019 to	0	0%	0	0%

			26/06/2020)				
			1-2 (27/06/2018 to 26/06/2019)	0	0%	0	0%
			2-3 (27/06/2017 to 26/06/2018)	0	0%	0	0%
			3-4 (27/06/2016 to 26/06/2017)	5,540	77%	69	77%
			4-5 (27/06/2015 to 26/06/2016)	1505	21%	19	21%
			5-6 (27/06/2014 to 26/06/2015)	110	2%	1	2%

For improved cookstoves:

As per Section B.7.2 of the VPA-DD and TPDDTEC v3.1, the following sampling design was implemented for the VPAs-

The VPAs are implemented in Karnataka (a state in India) which has a homogenous distribution of its population. Due to the homogeneity feature of these VPAs, simple random sampling method was applied. A simple random sample is a subset of a population (e.g. villages, individuals, buildings, pieces of equipment) chosen randomly,

such that each element (or unit) of the population has the same probability of being selected. The sample-based estimate (mean or proportion) is an unbiased estimate of the population parameter.

- **Usage Survey**

1. As per the requirement TPDDTEC v3.1, a minimum total sample size for Usage Survey is 100 with at least 30 samples for project technologies of each age being credited.
2. For VPAs there is only 1 PO implementing only 1 model of stove in the State of Karnataka. 100 sales were randomly selected for the entire population per VPA.

- **Project KPT**

For determining the sample size for project fuel consumption, Annex 4 of the TPDDTEC v3.1 was referenced. Additionally, simple random sampling was used to select the households from the entire population.

As per Annex4 for the TPDDTEC v3.1, 90 samples had to be selected considering the independent sampling process.

Table 2 : Sample sizes in cases of INDEPENDENT samples (households sampled in the project situation are different from households sampled in the baseline situation). This is the size required for each of the baseline and project samples.

COV	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2
90/30 precision	90	105	122	140	159	180	201	224	248

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

1. VPA19

Parameter	**Monitoring Frequency**	**CEPs added during this MP (01/01/2021 to 31/12/2021)**	**Previous Monitoring Dates**	**Validity of Previous Monitoring results till**	**New Monitoring for this MP**
Usage Survey	Annual	No	21/01/2021 - 04/02/2021	31/12/2021	Yes
Project KPT	Biennial	No	-	-	Yes

Solar Lighting System	Annual	No	20/01/2021 - 20/02/2021	31/12/2021	Yes

Improved Cookstoves: Monitoring usage surveys for various parameters in this monitoring period was conducted in .
07/01/2022 to 25/01/2022. Project KPT was conducted in the month of July/August 2021 (wet season) and January/February 2022 (dry season). For next monitoring period, fresh usage survey and KPT will be conducted.

Solar lighting systems:
Monitoring field surveys for various parameters in this monitoring period were conducted in 03/01/2022 to 14/02/2022 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. VPA21

Parameter	**Monitoring Frequency**	**CEPs added during this MP (01/01/2021 to 31/12/2021)**	**Previous Monitoring Dates**	**Validity of Previous Monitoring results till**	**New Monitoring for this MP**
Usage Survey	Annual	No	15/01/2021 - 15/02/2021	31/12/2021	Yes
Project KPT	Biennial	No	-	-	Yes
Solar Lighting System	Annual	No	20/01/2021 - 20/02/2021	31/12/2021	Yes

Improved Cookstoves: Monitoring usage surveys for various parameters in this monitoring period was conducted in 06/01/2022 to 25/01/2022. Project KPT was conducted in the month of July/August 2021 (wet season) and January/February 2022 (dry season). For next monitoring period, fresh usage survey and KPT will be conducted.

Solar lighting systems:

Monitoring field surveys for various parameters in this monitoring period were conducted in 01/01/2022 to 26/02/2022 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.

3. VPA24

Parameter	Monitoring Frequency	CEPs added during this MP (01/01/2021 to 31/12/2021)	Previous Monitoring Dates	Validity of Previous Monitoring results till	New Monitoring for this MP
Usage Survey	Annual	No	24/01/2021 - 14/02/2021	31/12/2021	Yes
Project KPT	Biennial	No	-	-	Yes
Solar Lighting System	Annual	No	20/01/2021 - 16/02/2021	31/12/2021	Yes

Improved Cookstoves: Monitoring usage surveys for various parameters in this monitoring period was conducted in 03/01/2022 to 17/01/2022. Project KPT was conducted in the month of July/August 2021 (wet season) and January/February 2022 (dry season). For next monitoring period, fresh usage survey and KPT will be conducted.

Solar lighting systems:
Monitoring field surveys for various parameters in this monitoring period were conducted in 05/01/2022 to 15/01/2022 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. VPA26

Parameter	Monitoring Frequency	CEPs added during this MP (01/01/2021	Previous Monitoring Dates	Validity of Previous Monitoring results till	New Monitoring for this MP

		to 31/12/2021)			
Usage Survey	Annual	No	20/01/2021 - 16/02/2021	31/12/2021	Yes
Project KPT	Biennial	No	-	-	Yes
Solar Lighting System	Annual	No	22/01/2021 - 19/02/2021	31/12/2021	Yes

Improved Cookstoves: Monitoring usage surveys for various parameters in this monitoring period was conducted in 03/01/2022 to 24/01/2022. Project KPT was conducted in the month of July/August 2021 (wet season) and January/February 2022 (dry season). For next monitoring period, fresh usage survey and KPT will be conducted.

Solar lighting systems:
Monitoring field surveys for various parameters in this monitoring period were conducted in 10/01/2022 to 06/02/2022 for solar lighting systems. Quarterly monitoring will be ongoing to determine the Lamp Failure Rate. For the next monitoring period fresh monitoring may be carried.

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

1. **VPA19:**

Improved cookstoves (SKDRDP):

S.No	Parameter	Sampling approach	Sample size
1	Usage rate in project scenario p during year y ($U_{p,y}$)	Simple random sampling for proportion-based parameter	100
2	Quantity of fuel that is consumed in project scenario p during year y ($P_{p,y}$)	Carry out KPTs- Simple random sampling for mean based parameter	90

Solar lighting systems (SKDRDP, Asirvad and ESAF):

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 proportion-based parameter	For e.g.: **As per sample size calculation, sample size requirement for:** SKDRDP PLT3F1HLS (KA) - 27 Asirvad Glosolar HLS (RJ) – 15 ESAF Sunking Pico Plus (KL) - 47 **Actual monitored samples for:** SKDRDP PLT3F1HLS (KA) - 30 Asirvad Glosolar HLS (RJ) – 24	As per guidance given in para 13 and 14, page 7 and 8 of Standard for Sampling and surveys for CDM project activities and programme of activities version 9.0, 30 samples are chosen randomly and separately from each model per state. For e.g. 30 samples are chosen randomly for monitoring for SKDRDP PLT3F1HLS (KA). For some of the models like Asirvad Glosolar HLS (RJ) the total number of sales is less than 30 and hence all units (24) are sampled. For some models such as ESAF Sunking Pico Plus (KL), the sample size is more than 30 and hence the required sample size (47) are randomly selected and monitored. Details on sample size for all other models and calculation is provided in Emission reduction calculation sheet.

			ESAF Sunking Pico Plus (KL) - 47	

2. **VPA21:**

Improved cookstoves (SKDRDP):

S.No	Parameter	Sampling approach	Sample size
1	Usage rate in project scenario p during year y ($U_{p,y}$)	Simple random sampling for proportion-based parameter	129
2	Quantity of fuel that is consumed in project scenario p during year y ($P_{p,y}$)	Carry out KPTs- Simple random sampling for mean based parameter	90

Solar lighting systems (ESAF, Simpa, Asirvad and Bandhan):

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 proportion-based parameter	For e.g.: **As per sample size calculation, sample size requirement for:** Bandhan Sunking Pro 400 (OD) – 27 Simpa SP Inverter 200 (BH) – 12	As per guidance given in para 13 and 14, page 7 and 8 of Standard for Sampling and surveys for CDM project activities and programme of activities version 9.0, 30 samples are chosen randomly and separately from each model per state. For e.g. 30 samples are chosen randomly for monitoring for Bandhan Sunking Pro 400 (OD). For some of the models like Simpa SP Inverter 200 (BH), the

			Asirvad Sunking Boom (KA) - 47 **Actual monitored samples for:** Bandhan Sunking Pro 400 (OD) – 30 Simpa SP Inverter 200 (BH) – 14 Asirvad Sunking Boom (KA) - 47	total number of sales is less than 30 and hence all units (14) are sampled. For some models like Asirvad Sunking Boom (KA), the sample size is more than or equal to 30 and hence the required sample size requirement (47) are randomly selected and monitored. Details on sample size for all other models and calculation is provided in Emission reduction calculation sheet.

3. **VPA24:**

Improved cookstoves (SKDRDP):

S.No	Parameter	Sampling approach	Sample size
1	Usage rate in project scenario p during year y ($U_{p,y}$)	Simple random sampling for proportion-based parameter	100
2	Quantity of fuel that is consumed in project scenario p during year y ($P_{p,y}$)	Carry out KPTs- Simple random sampling for mean based parameter	90

Solar lighting systems (SKDRDP):

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 proportion-based parameter	For e.g.: **As per sample size calculation, sample size requirement for:** SKDLT3 – 20 CL1LT1HLS - 7 **Actual monitored samples for:** SKDLT3 – 30 CL1LT1HLS – 9	As per guidance given in para 13 and 14, page 7 and 8 of Standard for Sampling and surveys for CDM project activities and programme of activities version 9.0, 30 samples are chosen randomly and separately from each model per state. For e.g. 30 samples are chosen randomly for monitoring for SKDLT3. For some of the models like CL1LT1HLS the total number of sales is less than 30 and hence all units (90) are sampled. Details on sample size for all other models and calculation is provided in Emission reduction calculation sheet.

4. **VPA26:**

Improved cookstoves (SKDRDP):

S.No	Parameter	Sampling approach	Sample size
1	Usage rate in project scenario p during year y ($U_{p,y}$)	Simple random sampling for proportion-based parameter	100
2	Quantity of fuel that is consumed in project scenario p during year y ($P_{p,y}$)	Carry out KPTs- Simple random sampling for mean based parameter	90

Solar lighting systems (SKDRDP):

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 proportion-based parameter	For e.g.: **As per sample size calculation, sample size requirement for:** CL2HLS-19 CL1LT2HLS-10 **Actual monitored samples for:** CL2HLS - 30 CL1LT2HLS-13	As per guidance given in para 13 and 14, page 7 and 8 of Standard for Sampling and surveys for CDM project activities and programme of activities version 9.0, 30 samples are chosen randomly and separately from each model per state. For e.g. 30 samples are chosen randomly for monitoring for CL2HLS. For some of the models like CL1LT2HLS the total number of sales is less than 30 and hence all units (13) are sampled. Details on sample size for all other models and calculation is provided in Emission reduction calculation sheet.

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

The data collected after carrying out the monitoring surveys was further analysed to see if the required confidence/precision is met. The data collected from the surveys were compiled into the Excel spreadsheet. In order to achieve the 90/10 reliability level for simple random sampling few additional stoves 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 ICS as per TPDDTEC v3.1. In case, the confidence/precision is not met for any parameter for improved cookstove, the upper or lower bound is conservatively applied to arrive at final values for the parameter as per TPDDTEC v3.1.

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 TPDDTEC v3.1 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 Improved Cookstoves and Solar Lighting Systems

SDG 13: Climate Action (Improved Cookstoves)

The overall GHG reductions achieved by the project activity will be calculated as follows:

$$ER_y = \Sigma\ BE_{b,y} - \Sigma\ PE_{p,y} - \Sigma\ LE_{p,y}$$

Where:

ER_y	Emission reduction for total project activity in year y (tCO_2e/yr)
$BE_{b,y}$	Baseline emissions for baseline scenario b in year y (tCO_2e/yr)
$PE_{p,y}$	Project emissions for project scenario p in year y (tCO_2e/yr)
$LE_{p,y}$	Leakage for project scenario p in year y (tCO_2e/yr)

The project proponent must estimate emission reductions in the project documentation prior to validation using conservative assumptions for baseline and project scenario variables. The approach followed for ex-ante estimation is as follows:

$$BE_{b,y} = B_{b,y} * ((f_{NRB,\ y} * EF_{b,fuel,\ CO2}) + EF_{b,fuel,\ nonCO2}) * NCV_{b,\ fuel}$$

Where:

$BE_{b,y}$	Emissions for baseline scenario b during the year y in tCO2e
$B_{b,y}$	Quantity of fuel consumed in baseline scenario b during year y, in tons, as per by-default factors (cases with project performance field test only)
$f_{NRB, y}$	Fraction of biomass used during year y for the considered scenario that can be established as non-renewable biomass (drop this term from the equation when using a fossil fuel baseline scenario)
$NCV_{b,fuel}$	Net calorific value of the fuel that is substituted or reduced (IPCC default for wood fuel, 0.015 TJ/ton)
$EF_{b,fuel,CO2}$	CO2 emission factor of the fuel that is substituted or reduced. 112 tCO2/TJ for Wood/Wood Waste, or the IPCC default value of other relevant fuel
$EF_{b,fuel,nonCO2}$	Non-CO_2 emission factor of the fuel that is substituted or reduced

EF can include a combination of emission factors from fuel production, transport, and use. CO_2 and non-CO_2 emissions factors for charcoal may be estimated from project specific monitoring or alternatively by researching a conservative wood to charcoal production ratio (from IPCC, credible published literature, project-relevant measurement reports, or project-specific monitoring) and multiplying this value by the pertinent EF for wood.

$$B_{b,y} = N_{p,y} * P_{b,y}$$

Where:

$N_{p,y}$	Project technology-days in the project database for project scenario p through year y
$P_{b,y}$	Specific fuel consumption for an individual technology in baseline scenario b during year y converted to tons/day

Project emission calculations are conducted as follows:

$$PE_{p,y} = B_{p,y} * ((f_{NRB, y} * EF_{p,fuel, CO2}) + EF_{p,fuel, nonCO2}) * NCV_{p, fuel}$$

Where:

$PE_{p,y}$	Emissions for project scenario p during year y in tCO2e
$B_{p,y}$	Quantity of fuel consumed in project scenario p during year y, in tons, and as derived from the statistical analysis conducted on the data collected during the project performance field tests (cases when no baseline performance field test are performed, e.g. by-default baseline factors)
$f_{NRB, y}$	Fraction of biomass used during year y that can be established as non-renewable biomass (drop this term from the equation when using a fossil fuel baseline scenario)

$NCV_{p,fuel}$ Net calorific value of the project fuel (IPCC default for wood fuel, 0.015 TJ/ton). This is equal to the baseline fuel NCV in projects which use the same fuel.

$EF_{p,fuel,CO2}$ CO_2 emission factor of the project fuel. This is equal to the baseline fuel EF in projects which use the same fuel, 112 tCO2/TJ for Wood/Wood Waste, or the IPCC default value of other relevant fuel

$EF_{p,fuel,nonCO2}$ Non-CO_2 emission factor of the project fuel. This is equal to the baseline fuel EF in projects which use the same fuel.

Whereas, ex-post the Emission Reductions can be calculated using the following equation:

When the baseline fuel and the project fuel are the same and the baseline emission factor and project emission are considered the same, the overall GHG reductions achieved by the project activity in year y are calculated as follows:

$$ERy = \Sigma_{b,p} (N_{p,y} * U_{p,y} * P_{p,b,y} * NCV_{b,\,fuel} * (f_{NRB,b,\,y} * EF_{fuel,\,CO2} + EF_{fuel,\,nonCO2})) - \Sigma\, LE_{p,y}$$

Where:

$\Sigma_{b,p}$ Sum over all relevant (baseline b/project p) couples

$N_{p,y}$ Cumulative number of project technology-days included in the project database for project scenario p against baseline scenario b in year y

$U_{p,y}$ Cumulative usage rate for technologies in project scenario p in year y, based on cumulative adoption rate and drop off rate revealed by usage surveys (fraction)

$P_{p,b,y}$ Specific fuel savings for an individual technology of project p against an individual technology of baseline b in year y, in tons/day, as derived from the statistical analysis of the data collected from the field tests

$f_{NRB,b,\,y}$ Fraction of biomass used in year y for baseline scenario b that can be established as non-renewable biomass (drop this term from the equation when using a fossil fuel baseline scenario)

$NCV_{b,fuel}$ Net calorific value of the fuel that is substituted or reduced (IPCC default for wood fuel, 0.015 TJ/ton)

$EF_{b,fuel,CO2}$ CO_2 emission factor of the fuel that is substituted or reduced. 112 tCO_2/TJ for Wood/Wood Waste, or the IPCC default value of other relevant fuel

$EF_{b,fuel,nonCO2}$ Non-CO_2 emission factor of the fuel that is reduced

$LE_{p,y}$ Leakage for project scenario p in year y (tCO_2e/yr)

Leakage, if applicable, will be assessed on the following points:

a) The displaced baseline technologies are reused outside the project boundary in place of lower emitting technology or in a manner suggesting more usage than would have occurred in the absence of the project.
b) The NRB or fossil fuels saved under the project activity are used by non-project users who previously used lower emitting energy sources.
c) The project significantly impacts the NRB fraction within an area where other CDM or VER project activities account for NRB fraction in their baseline scenario.

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

For example, calculation for baseline emission for Jumbo Stove Karnataka for VPA24 has been demonstrated below:

ER_y (Jumbo Stove) = 7,658,795*0.90*(0.0071-0.0027)*0.0156*(0.86*112+37.25)-0 = 63,188 tCO2e

The above example is sample calculation for one of the Partner-Model-State combinations for one VPA. The baseline emissions for Improved cookstoves included in the VPA19, VPA21, VPA24 and VPA26 requesting issuance as part of this monitoring report is 238,182 tCO_2e.

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

13: Climate Action: Solar Lighting Systems

<table>
<tr><td>Applied methodology/approach</td><td>Equation/calculation</td></tr>
<tr><td>13.2.2 Amount of CO_2e emissions reduced by the project per year

Approach: AMS.I.A., version 14.0</td><td>Total baseline emissions for period v are calculated as the sum of the baseline emissions of each lamp type i in the period:

$BE_v = \sum_{i=1}^{n} BE_{i,v}$ (Eq. 2)

<table>
<tr><td>Parameter</td><td>Unit</td><td>Type</td><td>Value</td></tr>
<tr><td>BE_v</td><td>tCO_2</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>tCO_2</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:</td></tr>
</table>

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

(Eq. 3)

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* 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 this parameter (confidence level 90%).

Where:

$$CF_{i,v,LFR} = 1 - \left(LFR_{i,v} + z * \sqrt{\frac{LFR_{i,v} * (1 - LFR_{i,v})}{n_{i,v,total}}}\right)$$ (Eq. 4)

Parameter	Unit	Type	Value
$CF_{i,v,LFR}$	-	Calculated	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 this parameter (confidence level 90%).
$LFR_{i,v}$	%	Monitored	Share of lamps of lamp type *i* in checked sample group $g_{i,v}$ not operational in period *v*.
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.

Sample calculation for solar lighting systems for product model Bandhan Sunking Pro400 for the state of Bihar for VPA21:

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

BEi,v = (6431*359)*140.538*3.5*(1/0.13)*0.0719*10-6*3.6*96.06%

= 2,173.37 tCO2

The above example is sample calculation for one of the Model-State combinations for the VPA. The baseline emissions for solar lighting systems included in VPA-19, VPA21, VPA24 and VPA26 requesting issuance as part of this monitoring report is 53,685 tCO_2e.

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

SDG 1: No Poverty

$BSA_{Baseline}$ Number of ICS/SLS distributed in baseline = 0

SDG 3: Good Health and Well Being

$SPM_{HH,Baseline}$ % HH reporting reduction in smoke while cooking on improved stove in baseline = 0

SDG 5: Gender Equality

$HHTS_{Baseline}$ % HH reporting time saving from fuel collection due to reduced fuel consumption in baseline = 0

SDG 7: Affordable and Clean Energy

$ACS_{Baseline}$ Access to affordable and clean energy (Number of operating ICS/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

>>

VPA19

13: Climate Action: Solar Lighting Systems

There are no project emission calculations for this VPA requesting issuance. For solar lighting systems, there are no project emissions. For improved cookstoves, the equation for calculating emission reductions already accounts for project emissions.

SDG 1: No Poverty

$BSA_{Project}$ Number of ICS distributed in Project = 21,000
Number of SLS distributed in Project = 40,164

Net Benefit ICS (SDG 1) = $BSA_{Project}$ – $BSA_{Baseline}$
= 21,000 – 0
= 21,000

Net Benefit SLS (SDG 1) = $BSA_{Project}$ – $BSA_{Baseline}$
= 40,164 - 0
= 40,164

SDG 3: Good Health and Well Being

$SPM_{HH,Project}$ % HH reporting reduction in smoke while cooking on improved stove in project = 82%

Net Benefit (SDG 3) = $SPM_{HH,Project}$ – $SPM_{HH,Baseline}$
= 82% - 0%
= 82%

SDG 5: Gender Equality

$HHTS_{Project}$ % HH reporting time saving from fuel collection due to reduced fuel consumption in project = 82%

Net Benefit (SDG 5) = $HHTS_{Project}$ – $HHTS_{Baseline}$
= 82% - 0%
= 82%

SDG 7: Affordable and Clean Energy

$ACS_{Project}$ Access to affordable and clean energy (Number of operating ICS units under Project) = 21,000*0.82 = 17,200
Access to affordable and clean energy (Number of operating SLS units under Project) = 40,164*98.36%=39,506

Net Benefit ICS (SDG 7) = $ACS_{Project}$ - $ACS_{Baseline}$
= (21,000 * 0.82%) – 0
= 17,220

Net Benefit SLS (SDG 7) = $ACS_{Project}$ - $ACS_{Baseline}$
= (40,164*98.21%) - 0
=39,445

SDG 8: Decent Work and Economic Growth

$QE\ IG_{Project}$ Quantitative Employment and income generation (Number of person (male and female) hired under Project) = 73

Net Benefit (SDG 8) = $QE\ IG_{Project}$ - $QE\ IG_{Baseline}$
= 73 – 0
= 73

VPA21

13: Climate Action: Solar Lighting Systems

There are no project emission calculations for this VPA requesting issuance. For solar lighting systems, there are no project emissions. For improved cookstoves, the equation for calculating emission reductions already accounts for project emissions.

SDG 1: No Poverty

$BSA_{Project}$ Number of ICS distributed in Project = 22,000
Number of SLS distributed in Project = 136,182

Net Benefit ICS (SDG 1) = $BSA_{Project} - BSA_{Baseline}$
= 22,000– 0
= 22,000

Net Benefit SLS (SDG 1) = $BSA_{Project} - BSA_{Baseline}$
= 136,182- 0
= 136,182

SDG 3: Good Health and Well Being

$SPM_{HH,Project}$ % HH reporting reduction in smoke while cooking on improved stove in project = 84%

Net Benefit (SDG 3) = $SPM_{HH,Project} - SPM_{HH,Baseline}$
= 84% - 0%
= 84%

SDG 5: Gender Equality

$HHTS_{Project}$ % HH reporting time saving from fuel collection due to reduced fuel consumption in project = 84%

Net Benefit (SDG 5) = $HHTS_{Project} - HHTS_{Baseline}$
= 84% - 0%
= 84%

SDG 7: Affordable and Clean Energy

$ACS_{Project}$ Access to affordable and clean energy (Number of operating ICS units under Project) = 22,000*84% = 18,450
Access to affordable and clean energy (Number of operating SLS units under Project) = 136,182*96.37% = 131,242

Net Benefit ICS (SDG 7) = $ACS_{Project} - ACS_{Baseline}$
= (22,000 *84%) – 0

= 18,450

Net Benefit SLS (SDG 7) = $ACS_{Project}$ - $ACS_{Baseline}$
= (136,182*96.37%) – 0
= 131,242

SDG 8: Decent Work and Economic Growth

$QE\ IG_{Project}$ Quantitative Employment and income generation (Number of person (male and female) hired under Project) = 85

Net Benefit (SDG 8) = $QE\ IG_{Project}$ - $QE\ IG_{Baseline}$
=85 – 0
= 85

VPA24

13: Climate Action: Solar Lighting Systems

There are no project emission calculations for this VPA requesting issuance. For solar lighting systems, there are no project emissions. For improved cookstoves, the equation for calculating emission reductions already accounts for project emissions.

SDG 1: No Poverty

$BSA_{Project}$ Number of ICS distributed in Project = 21,000
Number of SLS distributed in Project = 237

Net Benefit ICS (SDG 1) = $BSA_{Project}$ – $BSA_{Baseline}$
= 21,000 – 0
= 21,000

Net Benefit SLS (SDG 1) = $BSA_{Project}$ – $BSA_{Baseline}$
= 237 - 0
= 237

SDG 3: Good Health and Well Being

$SPM_{HH,Project}$ % HH reporting reduction in smoke while cooking on improved stove in project = 90%

Net Benefit (SDG 3) = $SPM_{HH,Project}$ – $SPM_{HH,Baseline}$
= 90% - 0%
= 90%

SDG 5: Gender Equality

$HHTS_{Project}$ % HH reporting time saving from fuel collection due to reduced fuel consumption in project = 90%

Net Benefit (SDG 5) = $HHTS_{Project}$ – $HHTS_{Baseline}$
= 90% - 0%
= 90%

SDG 7: Affordable and Clean Energy

$ACS_{Project}$ Access to affordable and clean energy (Number of operating ICS units under Project) = 21,000*0.9 = 18,900
Access to affordable and clean energy (Number of operating SLS units under Project) = 237*85.98% = 204

Net Benefit ICS (SDG 7) = $ACS_{Project}$ - $ACS_{Baseline}$
= (21,000 * 0.9%) – 0
= 18,900
Net Benefit SLS (SDG 7) = $ACS_{Project}$ - $ACS_{Baseline}$
= (237*85.98%) - 0
= 204

SDG 8: Decent Work and Economic Growth

$QE\ IG_{Project}$ Quantitative Employment and income generation (Number of person (male and female) hired under Project) = 30

Net Benefit (SDG 8) = $QE\ IG_{Project}$ - $QE\ IG_{Baseline}$
= 30 – 0
= 30

VPA26

13: Climate Action: Solar Lighting Systems

There are no project emission calculations for this VPA requesting issuance. For solar lighting systems, there are no project emissions. For improved cookstoves, the equation for calculating emission reductions already accounts for project emissions.

SDG 1: No Poverty

$BSA_{Project}$ Number of ICS distributed in Project = 20,124
Number of SLS distributed in Project = 175

Net Benefit ICS (SDG 1) = $BSA_{Project}$ – $BSA_{Baseline}$
= 20,124 – 0
= 20,124

Net Benefit SLS (SDG 1) = $BSA_{Project}$ – $BSA_{Baseline}$
= 175 - 0

= 175

SDG 3: Good Health and Well Being

$SPM_{HH,Project}$ % HH reporting reduction in smoke while cooking on improved stove in project = 80%

Net Benefit (SDG 3) = $SPM_{HH,Project}$ – $SPM_{HH,Baseline}$
= 90% - 0%
= 90%

SDG 5: Gender Equality

$HHTS_{Project}$ % HH reporting time saving from fuel collection due to reduced fuel consumption in project = 100%

Net Benefit (SDG 5) = $HHTS_{Project}$ – $HHTS_{Baseline}$
= 90% - 0%
= 90%

SDG 7: Affordable and Clean Energy

$ACS_{Project}$ Access to affordable and clean energy (Number of operating ICS units under Project) = 20,124 *0.9 = 18,112
Access to affordable and clean energy (Number of operating SLS units under Project) = 175*95.60% = 167

Net Benefit ICS (SDG 7) = $ACS_{Project}$ - $ACS_{Baseline}$
= (20,124 * 0.9%) – 0
= 18,112

Net Benefit SLS (SDG 7) = $ACS_{Project}$ - $ACS_{Baseline}$
= (175*95.60%) - 0
= 167

SDG 8: Decent Work and Economic Growth

$QE\ IG_{Project}$ Quantitative Employment and income generation (Number of person (male and female) hired under Project) = 30

Net Benefit (SDG 8) = $QE\ IG_{Project}$ - $QE\ IG_{Baseline}$
= 30 – 0
= 30

E.3. Calculation of leakage

>>

Leakage for this VPA = 0

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

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
13	Amount of VERs	VPA19-69,441 VPA21-103,884 VPA24-63,254 VPA26-55,288	0	VPA19-69,441 tCO_2e VPA21-103,884 tCO_2e VPA24-63,254 tCO_2e VPA26-55,288 tCO_2e
1	Number of households with Improved Cookstoves	0	VPA19 21,000 VPA21 22,000 VPA24 21,000 VPA26 40,164	VPA19 21,000 VPA21 22,000 VPA24 21,000 VPA26 40,164
1	Number of households with Solar Lighting Systems	0	VPA19 40,164 VPA21 136,182 VPA24 237 VPA26 175	VPA19 40,164 VPA21 136,182 VPA24 237 VPA26 175
3	% Households confirming less smoke with use of ICS/SLS	0%	VPA19-82% VPA21-84% VPA24-90% VPA26-90%	VPA19-82% VPA21-84% VPA24-90% VPA26-90%
5	% Households confirming time saving with cooking and fuel collection	0%	VPA19-82% VPA21-84% VPA24-90% VPA26-90%	VPA19-82% VPA21-84% VPA24-90% VPA26-90%
7	Number of beneficiaries with ICS	0	VPA19 17,220 VPA21 18,450 VPA24 18,900 VPA26 18,112	VPA19 17,220 VPA21 18,450 VPA24 18,900 VPA26 18,112
7	Number of beneficiaries with SLS	0	VPA19 39,445 VPA21 131,242 VPA24 204	VPA19 39,445 VPA21 131,242 VPA24 204

			VPA26 | 167	VPA26 | 167
8	Quantitative Employment and income generation	0	VPA19-73 VPA21-85 VPA24-30 VPA26-30	VPA19-73 VPA21-85 VPA24-30 VPA26-30

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[7] achieved during this monitoring period
13	VPA19 – 113,194 tCO_2e VPA21 – 149,648 tCO_2e VPA24 – 123,421 tCO_2e VPA26 – 159,507 tCO_2e	VPA19 – 69,441 tCO_2e VPA21 – 103,884 tCO_2e VPA24 – 63,254 tCO_2e VPA26 – 55,288 tCO_2e
1	**VPA** | **ICS** 19 | 23,000 21 | 27,000 24 | 23,000 26 | 27,000	**VPA** | **ICS** 19 | 21,000 21 | 22,000 24 | 21,000 26 | 20,124
1	**VPA** | **SLS** 19 | 178,918 21 | 231,800 24 | 158,945 26 | 199,400	**VPA** | **SLS** 19 | 40,164 21 | 136,182 24 | 237 26 | 175
3	VPA19 – 100% VPA21 – 100% VPA24 – 100%	VPA19 – 82% VPA21 –84% VPA24 – 90%

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

<table>
<tr><td></td><td>VPA26 – 100%</td><td>VPA26 – 90%</td></tr>
<tr><td>5</td><td>VPA19 – 100%
VPA21 – 100%
VPA24 – 100%
VPA26 – 100%</td><td>VPA19 – 82%
VPA21 – 84%
VPA24 – 90%
VPA26 – 90%</td></tr>
<tr><td>7</td><td><table><tr><th>VPA</th><th>ICS</th></tr><tr><td>19</td><td>20,340</td></tr><tr><td>21</td><td>23,400</td></tr><tr><td>24</td><td>20,340</td></tr><tr><td>26</td><td>23,062</td></tr></table></td><td><table><tr><th>VPA</th><th>ICS</th></tr><tr><td>19</td><td>17,220</td></tr><tr><td>21</td><td>18,450</td></tr><tr><td>24</td><td>18,900</td></tr><tr><td>26</td><td>18,112</td></tr></table></td></tr>
<tr><td></td><td><table><tr><th>VPA</th><th>SLS</th></tr><tr><td>19</td><td>178,918</td></tr><tr><td>21</td><td>231,800</td></tr><tr><td>24</td><td>158,945</td></tr><tr><td>26</td><td>199,400</td></tr></table></td><td><table><tr><th>VPA</th><th>SLS</th></tr><tr><td>19</td><td>39,445</td></tr><tr><td>21</td><td>131,242</td></tr><tr><td>24</td><td>204</td></tr><tr><td>26</td><td>167</td></tr></table></td></tr>
<tr><td>8</td><td>20</td><td>VPA19- 73
VPA21- 85
VPA24- 30
VPA26- 30</td></tr>
</table>

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

>>

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

To achieve a comparable value of estimates for this monitoring period for VPA19 and 21, these are the factors/values considered:

- Since both the technologies (Improved cookstoves and solar lighting systems) in these VPAs are implemented total value of ex ante emission reduction is used for estimation. Total ex ante estimated value for Year-2 and Year-3 of operation of the VPAs from start date of crediting period is considered.

- The estimation of ex ante value is made for 171 days (Year 2) and 194 days (Year 3) totalling to 365 days (which is crediting days for this monitoring period[8].

To achieve a comparable value of estimates for this monitoring period for VPA24 and 26, these are the factors/values considered:

- Since both the technologies (Improved cookstoves and solar lighting systems) in these VPAs are implemented total value of ex ante emission reduction is used for estimation. Total ex ante estimated value for Year-2 and Year-3 of operation of the VPAs from start date of crediting period is considered.

- The estimation of ex ante value is made for 333 days (Year 2) and 32 days (Year 3) totalling to 365 days (which is crediting days for this monitoring period[9].

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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Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
Principle 1. Human Rights			

[8] For detailed calculation of "Amount estimated ex ante for this monitoring period in the VPA-DD (t CO_2e)" of this VPA, please refer to the emission reduction calculation sheet.

[9] For detailed calculation of "Amount estimated ex ante for this monitoring period in the VPA-DD (t CO_2e)" of this VPA, please refer to the emission reduction calculation sheet.

1. The Project Developer and the Project shall respect internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights	No	The VPA and CME both respect human rights and are not complicit in violence or human rights abuses.	Not required
2. The Project shall not discriminate with regards to participation and inclusion	No	The VPA does not discriminate with regards to participation and inclusion	Not required
Principle 2. Gender Equality			
1. The Project shall not directly or indirectly lead to/contribute to adverse impacts on gender equality and/or the situation of women a. Sexual harassment and/or any forms of violence against women – address the multiple risks of gender-based violence, including sexual exploitation or human trafficking.	No	Not relevant	Not required
b. Slavery, imprisonment, physical and mental drudgery, punishment or coercion of women and girls.	No	Not relevant	Not required
c. Restriction of women's rights or access to resources (natural or economic).	No	Not relevant	Not required
d. Recognise women's ownership rights regardless of marital status – adopt project measures where possible to support to women's access to inherit and own land, homes, and other assets or natural resources.	No	Not relevant	Not required

2. Projects shall apply the principles of non-discrimination, equal treatment, and equal pay for equal work a. Where appropriate for the implementation of a VPA, paid, volunteer work or community contributions will be organised to provide the conditions for equitable participation of men and women in the identified tasks/activities.	No	Not relevant	Not required
b. Introduce conditions that ensure the participation of women or men in Project activities and benefits based on pregnancy, maternity/paternity leave, or marital status.	No	Not relevant	Not required
c. Ensure that these conditions do not limit the access of women or men, as the case may be, to VPA participation and benefits.	No	Not relevant	Not required
3. The Project shall refer to the country's national gender strategy or equivalent national commitment to aid in assessing gender risks	No	The Project takes into account the National Policy for the Empowerment of Women (2011) in the "advancement of gender equality and empowerment of women". The Project is designed to empower women and improve livelihoods. No gender risks are envisaged in the PoA	Not required
4. (where required) Summary of opinions and recommendations of an Expert Stakeholder(s)	No	Not relevant	Not required

Principle 3. Community Health, Safety and Working Conditions			
1. The Project shall avoid community exposure to increased health risks and shall not adversely affect the health of the workers and the community	Yes	The VPA reduces exposure to indoor air pollutants and smoke levels, further reducing incidence of respiratory illness compared to cooking on traditional biomass stoves using solid biomass fuel.	Not required
Principle 4.1 Sites of Cultural and Historical Heritage			
1. Does the Project Area include sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture?	No	Not relevant	Not required
Principle 4.2 Forced Eviction and Displacement			
1. Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)?	No	Not relevant	Not required
Principle 4.3 Land Tenure and Other Rights			
1. Does the Project require any change, or have any uncertainties related to land tenure arrangements and/or access rights, usage rights or land ownership?	No	Not relevant	Not required
Principle 4.4 - Indigenous people			

1. Are indigenous peoples present in or within the area of influence of the Project and/or is the Project located on land/territory claimed by indigenous peoples?	No	Since this is an Improved cookstove and Solar Lighting system project at household/institution level, there is no risk to land/territory claimed by indigenous people. The devices will be distributed to all willing customers within the project boundary.	N/A
Principle 5. Corruption			
1. The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects	No	The CME does not promote/ or is complicit in direct or indirect corruption.	Not required
Principle 6.1 Labour Rights			
1. The 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	No	The VPA does not involve any forced labour and the CME/VPA Implementer ensures that all employment is in compliance with local labour regulations and laws.	Not required
2. Workers shall be able to establish and join labour organisations	No	The CME puts no constraints / limitation on employees to form a union.	Not required

3. Working agreements with all individual workers shall be documented and implemented and include: a. Working hours (must not exceed 48 hours per week on a regular basis), AND b. Duties and tasks, AND c. Remuneration (must include provision for payment of overtime), AND d. Modalities on health insurance, AND e. Modalities on termination of the contract with provision for voluntary resignation by employee, AND f. Provision for annual leave of not less than 10 days per year, not including sick and casual leave.	No	The CME's policies and employment contracts are compliant with the requirement	Not required
4. No child labour is allowed (Exceptions for children working on their families' property requires an Expert Stakeholder opinion)	No	The CME does not promote / or is complicit in child labour	Not required
5. The Project Developer shall ensure the use of appropriate equipment, training of workers, documentation and reporting of accidents and incidents, and emergency preparedness and response measures	No	Not relevant	Not required
Principle 6.2 Negative Economic Consequences			
1. Does the project cause negative economic consequences during and after project implementation?	No	No negative economic consequences are deemed applicable	Not required
Principle 7.1 Emissions			
1. Will the Project increase greenhouse gas emissions over the Baseline Scenario?	No	The VPA reduces GHG emissions relative to baseline scenario	Not required
Principle 7.2 Energy Supply			

1. Will the Project use energy from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users?	No	The project will reduce fuel resource consumption instead	Not required
Principle 8.1 Impact on Natural Water Patterns/Flows			
1. Will the Project affect the natural or pre-existing pattern of watercourses, ground-water and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?	No	Not applicable	Not required
Principle 8.2 Erosion and/or Water Body Instability			
1. Could the Project directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of erosion?	No	The VPA shall result in reduction in demand of biomass fuel in the region putting less pressure of forests for deforestation and will hence indirectly avoid erosion associated with tree cutting/ felling.	Not required
Principle 9.1 Landscape Modification and Soil			
1. Does the Project involve the use of land and soil for production of crops or other products?	No	Not applicable	Not required
Principle 9.2 Vulnerability to Natural Disaster			
1. Will the Project be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions?	No	Not applicable	Not required
Principle 9.3 Genetic Resources			

1. Could the Project be negatively impacted by or involve genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development, or take place in facilities or farms that include GMOs in their processes and production)?	No	Not applicable	Not required
Principle 9.4 Release of pollutants			
1. Could the Project potentially result in the release of pollutants to the environment?	No	Not applicable	Not required
Principle 9.5 Hazardous and Non-hazardous Waste			
1. Will the Project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials?	No	Not applicable	Not required
Principle 9.6 Pesticides & Fertilisers			
1. Will the Project involve the application of pesticides and/or fertilisers?	No	Not applicable	Not required
Principle 9.7 Harvesting of Forests			
1. Will the Project involve the harvesting of forests?	No	The VPA does not involve harvesting of forests. The VPA shall result in reduction in demand of biomass fuel in the region putting less pressure of forests for deforestation and will hence indirectly avoid erosion associated with tree cutting/ felling.	Not required
Principle 9.8 Food			

1. Does the Project modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives?	No	Not applicable	Not required
Principle 9.9 Animal husbandry			
1. Will the Project involve animal husbandry?	No	Not applicable	Not required
Principle 9.10 High Conservation Value Areas and Critical Habitats			
1. Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified?	No	Not applicable	Not required
Principle 9.11 Endangered Species			
Are there any endangered species identified as potentially being present within the Project boundary (including those that may route through the area)? AND/OR Does the Project potentially impact other areas where endangered species may be present through transboundary affects?	No	Not applicable	Not required

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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NA[10]

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

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NA

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

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NA

[10] We have not received any grievance for the programme at the end of this monitoring period.

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