

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

0 - Description of project

0 - Implementation of project

0 - Description of monitoring system applied by the project

0 - Data and parameters

0 - Calculation of SDG Impacts

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KEY PROJECT INFORMATION

Programme of Activity Information

GS ID of Programme	GS11450
Title of Programme	MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India
Version of POA-DD applicable to this monitoring report	2.0
Name and GS ID of fully Validated CPA/VPAs (i.e. non compliance check)	NA

Key Project Information

GS ID (s) of Project (s)	GS11476, GS11505, GS11477, GS11478, GS11481, GS11483, GS11451, GS11486
Title of the project (s) covered by monitoring report	GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - MicroEnergy Credits PoA – VPA 04- GS11476 GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - MicroEnergy Credits PoA – VPA 06- GS11505 ¹ GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - MicroEnergy Credits PoA – VPA 07- GS11477 GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - MicroEnergy Credits PoA – VPA 08- GS11478 GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - MicroEnergy Credits PoA – VPA 11- GS11481 GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - MicroEnergy Credits PoA – VPA 13- GS11483 GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - MicroEnergy Credits PoA – VPA 17- GS11451 GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - MicroEnergy Credits PoA – VPA 18- GS11486
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	VPA4-4.0 VPA5-4.0 VPA7-4.0 VPA8-4.0 VPA11-4.0 VPA13-3.0

¹ During CDM registration, there was an error in the name of VPA. GS ID 11505 is title MicroEnergy Credits PoA-CPA6, however it is actually VPA5. Hence, this VPA is being referred to as VPA5 in entire document.

	VPA17-4.0 VPA18-4.0
Version number of the monitoring report	2.0
Completion date of the monitoring report	25-10-2022
Date of project design certification	DDMMYYYY
Date of Last Annual Report	NA
Monitoring period number	1
Duration of this monitoring period	VPA4-01/01/2021 to 31/12/2021 VPA5-27/06/2020 to 31/12/2021 VPA7-01/01/2021 to 31/12/2021 VPA8-01/01/2021 to 31/12/2021 VPA11-27/06/2020 to 31/12/2021 VPA13-27/06/2020 to 31/12/2021 VPA17-01/01/2021 to 31/12/2021 VPA18-01/01/2021 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) AMS-III.AR "Substituting fossil based lighting with LED/CFL lighting systems (version 7) 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
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13 Climate Action (mandatory)	Number of VERs	VPA 4- 44,620	tCO ₂ e VERs
		VPA 5-68,446	
		VPA 7-52,851	
		VPA 8- 41,172	
		VPA 11-59,473	
		VPA 13-152,786	
		VPA 17- 68,813	
		VPA 18- 66,392	
1 End poverty in all its forms everywhere	Number of households with clean energy products	VPA 4-29,937	Number ICS
		VPA 5-19,963	
		VPA 7-28,495	
		VPA 8-23,337	
		VPA 11-14,220	
		VPA 13-27,000	
		VPA 17- 26,921	
		VPA 18-26,080	
1 End poverty in all its forms everywhere	Number of households with clean energy products	VPA 4- 19,794	Number of SLS
		VPA 5- 81,045	
		VPA 7-46,822	
		VPA 8-11,671	
		VPA 11-242,588	
		VPA 13-138,762	
		VPA17-0	
		VPA18-0	
3 Good Health and Wellbeing	% Households confirming less smoke with the use of improved cookstove and Solar lighting Systems instead of kerosene lamps	VPA 4-64%	%
		VPA 5-62%	
		VPA 7-66%	
		VPA 8-68%	
		VPA 11-64%	
		VPA 13-73%	
		VPA 17- 86%	
		VPA 18 – 83%	
5 Gender Equality	Average time saving associated with cooking and fuel collection	VPA 4- 64%	%
		VPA 5- 62%	
		VPA 7- 66%	
		VPA 8- 68%	
		VPA 11-64%	
		VPA 13-73%	
		VPA 17-86%	
		VPA 18-83%	
7 Affordable and Clean Energy	Number of beneficiaries (SLS)	VPA 4-14,375	Number
		VPA 5-66,137	
		VPA 7-35,522	
		VPA 8-9,421	
		VPA 11-183,085	

			VPA 13-132,324	
			VPA17-0	
			VPA18-0	
7 Affordable and Clean Energy	Number of beneficiaries (ICS)		VPA 4-17,127	Number
			VPA 5-11,013	
			VPA 7-17,036	
			VPA 8-14,228	
			VPA 11-9,005	
			VPA 13-19,809	
			VPA 17-23,152	
			VPA 18-21,648	
8 Decent Work and Economic Growth	Quantitative Employment and income generation		VPA 4- 30	Number
			VPA 5- 93	
			VPA 7- 60	
			VPA 8- 30	
			VPA 11- 48	
			VPA 13- 75	
			VPA 17- 30	
			VPA 18- 30	

Table 2 – Product Vintages

		Amount Achieved
Start Dates	End Dates	VERs
27/06/2020	31/12/2021	554,553

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 India². 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.

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)³, Cedar (formerly ESAF) and Canara. Solar lighting system are implemented by SKDRDP, ESAF, Muthoot, Simpa, Sarala, Arohan and Nakshi (formerly Bandhan).

Under these VPAs, 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

² <http://www.pciaonline.org/sierra-club>

³ skdrdpindia.org

program, as well as a robust and transparent carbon credit monitoring and tracking system to quantify and record the volume of carbon emission reductions created through the clean energy program. The carbon finance is used to expand and sustain the clean energy program through:

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

The goal of the VPAs 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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VPA4-GS ID11476

- a. Host Party (ies) - India
- b. Region/State/Province – Karnataka (KA) State for improved cookstove and solar lighting. Several regions within the State are included.
- c. City/Town/Community – Several Cities/Towns are included
- d. Physical/Geographic location – The exact location (address) of each CEP is captured in the Credit Tracker Platform and can be verified.

VPA5-GS ID11505

- a. Host Party (ies) - India
- b. Region/State/Province – Karnataka (KA) State for improved cookstove. For solar lighting systems, several states Karnataka (KA), Assam (AS), Bihar (BH), Kerala (KL), Gujarat (GJ), Madhya Pradesh (MP), Odisha (OD), Tamil Nadu (TN), Uttar Pradesh (UP), Haryana (HR), Jharkhand (JK), Rajasthan (RJ) and West Bengal (WB) and many region within those states are included.
- c. City/Town/Community – Several Cities/Towns are included
- d. Physical/Geographic location – The exact location (address) of each CEP is captured in the Credit Tracker Platform and can be verified.

VPA7-GS ID11477

- a. Host Party (ies) - India
- b. Region/State/Province – Karnataka (KA), Madhya Pradesh (MP), Chhattisgarh (CG) and Tamil Nadu (TN) states for improved cookstoves and several regions within these

states. For solar lighting systems, several states, Assam (AS), Bihar (BH), Jharkhand (JK), Karnataka (KA), Odisha (OD), Tripura (TR), Uttar Pradesh (UP), West Bengal (WB) and many regions within those states are included.

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

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

VPA8-GS ID11478

a. Host Party (ies) - India

b. Region/State/Province – Karnataka (KA) state for improved cookstove and solar home lighting systems.

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.

VPA11-GS ID11481

a. Host Party (ies) - India

b. Region/State/Province – Kerala (KL), Karnataka (KA), Maharashtra (MH) and Tamil Nadu (TN) States for improved cookstoves and several regions within these states. For solar lighting systems, Karnataka (KA), Kerala(KL), Gujarat (GJ), Madhya Pradesh (MP), Maharashtra (MH), Odisha (OD), Tamil Nadu (TN) and Uttar Pradesh (UP)

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.

VPA13-GS ID11483

a. Host Party (ies) - India

b. Region/State/Province – Karnataka state for improved cookstoves and several regions within this State. For solar lighting systems, several states, Assam (AS), Bihar (BH), Chhattisgarh (CG), Madhya Pradesh (MP), Jharkhand (JK), Odisha (OD), West Bengal (WB), Uttar Pradesh (UP), Tamil Nadu (TN), and many regions within those states are included.

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

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

VPA17-GS ID11451

- a. Host Party (ies) - India
- b. Region/State/Province – Karnataka State for improved cookstoves and several regions within the State. No solar sales disseminated until end of this monitoring but will be implemented in several States and regions in India.
- 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.

VPA18-GS ID11486

- a. Host Party (ies) - India
- b. Region/State/Province – Karnataka State for improved cookstoves and several regions within the State. No solar sales disseminated until end of this monitoring but will be implemented in several States and regions in India.
- 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.



Figure 1: Map of India

A.3. Reference of applied methodology

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Solar Lighting System: AMS-I.A "Electricity generation by the user, version 14"⁴

Solar Lighting System: AMS-III.AR "Substituting fossil fuel-based lighting with LED/CFL lighting systems, version 7.0"

Improved Cookstove: "Technologies and Practices to Displace Decentralized Thermal Energy Consumption (TPDDTEC), version 3.1"⁵

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	Crediting End Date (CP-1)	Crediting Start Date (CP-2)	GS4GG Crediting End Date	GS4GG Eligible Crediting End Date ⁶
GS11476	20/03/2015	19/03/2020	20/03/2020	19/03/2025	19/03/2030
GS11505	20/03/2015	19/03/2020	20/03/2020	19/03/2025	19/03/2030
GS11477	01/05/2015	30/04/2020	01/05/2020	30/04/2025	30/04/2030
GS11478	01/05/2015	30/04/2020	01/05/2020	30/04/2025	30/04/2030
GS11481	07/12/2016	06/12/2021	07/12/2021	06/12/2026	06/12/2031
GS11483	25/08/2018	24/08/2023	-	24/08/2023	24/08/2033
GS11451	25/01/2019	24/01/2024	-	24/01/2024	24/01/2034
GS11486	25/01/2019	24/02/2024	-	24/02/2024	24/02/2034

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

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These are the 8 VPAs implemented in this Batch.

VPA4 - GS ID: GS11476

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

⁴ [AMS I.A version 14.0](#)

⁵ [TPDDTEC version 3.1](#)

⁶ As these are CDM Transitioned projects, GS4GG allows a total crediting period of 15-years from the CDM crediting start date.

Purpose: Under the VPA, Micro Energy Credits works with PO – Shri Kshetra Dharmasthala Rural Development Project (SKDRP) 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 CPA involves marketing, distributing, and financing solar lighting systems and improved cook stoves for low income households and microentrepreneurs in Karnataka. 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 – 29,937

Solar Lamps – 56,342 (i.e. 19,794 Solar Lighting Systems)

b. 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 Smart Stove (GSSV3). Technical specifications are as follows –

Stove Body Size: 9.8" x 7.6" x 11.7"

Net weight: 2.5 kg

Average Life span under standard use conditions: 5 years

The rate of thermal efficiency – 25.19%

Solar lighting system:

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

1. Selco Eco Home 1 HLS (Model Number – EH1HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/10W
Lighting Wattage – 1.2
Luminous flux output (Lumens): 108
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):1
Battery type/capacity-Lead Acid Battery/15Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

2. Selco Eco Home 2 HLS (Model Number – EH2HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/10W
Lighting Wattage – 3.6
Luminous flux output (Lumens): 324
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):2
Battery type/capacity-Lead Acid Battery/15Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

3. Selco Eco Home 4 HLS (Model Number – EH4HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/10W
Lighting Wattage – 3.6
Luminous flux output (Lumens): 324
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):2
Battery type/capacity-Lead Acid Battery/15Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

4. Selco Smart Home 4 HLS (Model Number – SH4HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/10W
Lighting Wattage – 16.8
Luminous flux output (Lumens): 1512
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):4

Battery type/capacity-Lead Acid Battery/30Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

5. Selco Shankara 2 Light (Model Number – SKD2L):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/20W
Lighting Wattage – 9
Luminous flux output (Lumens): 780
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 2
Battery type/capacity-Lead Acid Battery/30Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

6. Bright Light Home 6 HLS (Model Number – B6HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/60W
Lighting Wattage – 32
Luminous flux output (Lumens): 2880
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):6
Battery type/capacity-Lead Acid Battery/80Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

7. Bright Light Home 2 HLS (Model Number – BH2HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/12W
Lighting Wattage – 6
Luminous flux output (Lumens): 540
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):2
Battery type/capacity-Lead Acid Battery/15Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

8. Bright Light Home 3 HLS (Model Number – BH3HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/18W

Lighting Wattage – 12.5

Luminous flux output (Lumens): 1125

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps):3

Battery type/capacity-Lead Acid Battery/20Ah, 12V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

9. Bright Light Home 4 HLS (Model Number – BH4HLS):

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/40W

Lighting Wattage – 14

Luminous flux output (Lumens): 1260

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps):2

Battery type/capacity-Lead Acid Battery/60Ah, 12V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

10. Model Number – CC4F1HLS2:

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/40W

Lighting Wattage – 32

Luminous flux output (Lumens): 2520

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps):4

Battery type/capacity-Lead Acid Battery/60Ah, 12V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

11. Model Number – CC4F2HLS:

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/40W

Lighting Wattage – 30

Luminous flux output (Lumens): 2350

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 4

Battery type/capacity-Lead Acid Battery/60Ah, 12V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

12. Model Number – CC3F1HLS:

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/40W

Lighting Wattage – 25

Luminous flux output (Lumens): 1970

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 3

Battery type/capacity-Lead Acid Battery/60Ah, 12V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

13. Model Number – CC8HLS:

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/75W

Lighting Wattage – 60

Luminous flux output (Lumens): 4700

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 8

Battery type/capacity-Lead Acid Battery/40Ah, 12V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

14. Model Number – CL1C2HLS:

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/20W

Lighting Wattage – 12.4

Luminous flux output (Lumens): 1010

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 4

Battery type/capacity-Lead Acid Battery/40Ah, 12V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

15. Model Number – CL2B1HLS:

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/20W

Lighting Wattage – 8.4

Luminous flux output (Lumens): 900

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 3
Battery type/capacity-Lead Acid Battery/40Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

16. Model Number – CL2C2HLS:
The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/30W
Lighting Wattage – 16.8
Luminous flux output (Lumens): 1430
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 4
Battery type/capacity-Lead Acid Battery/40Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

17. Model Number – CL2HLS2-2LED:
The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/15W
Lighting Wattage – 4.8
Luminous flux output (Lumens): 500
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 2
Battery type/capacity-Lead Acid Battery/40Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

18. Model Number – CL3C1HLS:
The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/20W
Lighting Wattage – 14.2
Luminous flux output (Lumens): 1300
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 4
Battery type/capacity-Lead Acid Battery/40Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

19. Model Number – CL3HLS:

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/20W
Lighting Wattage – 8.4
Luminous flux output (Lumens): 900
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 3
Battery type/capacity-Lead Acid Battery/20Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

20. Model Number – CL4HLS:

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/20W
Lighting Wattage – 9.6
Luminous flux output (Lumens): 1050
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 4
Battery type/capacity-Lead Acid Battery/20Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

21. Model Number – PL2C4HLS:

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/75W
Lighting Wattage – 52.4
Luminous flux output (Lumens): 4250
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 4
Battery type/capacity-Lead Acid Battery/75Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

22. Super Bright Home 10 HLS (Model Number – S10HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/100W
Lighting Wattage – 60
Luminous flux output (Lumens): 5400
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):8
Battery type/capacity-Lead Acid Battery/150Ah, 12V

Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

23. Super Bright Home 14 HLS (Model Number – S14HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/120W
Lighting Wattage – 82
Luminous flux output (Lumens): 7380
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):10
Battery type/capacity-Lead Acid Battery/120Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

24. Super Bright Home 15 HLS (Model Number – S15HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/120W
Lighting Wattage – 91
Luminous flux output (Lumens): 4700
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 12
Battery type/capacity-Lead Acid Battery/120Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

25. Super Bright Home 2 HLS (Model Number – SB2HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/18W
Lighting Wattage – 12
Luminous flux output (Lumens): 1080
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):2
Battery type/capacity-Lead Acid Battery/20Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

26. Super Bright Home 5 HLS (Model Number – SB5HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/50W
Lighting Wattage – 25

Luminous flux output (Lumens): 2250
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):3
Battery type/capacity-Lead Acid Battery/80Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

27. Super Bright Home 6 HLS (Model Number – SB6HLS):
The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/60W
Lighting Wattage – 46
Luminous flux output (Lumens): 4140
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):6
Battery type/capacity-Lead Acid Battery/80Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

28. Super Bright Home 8 HLS (Model Number – SB8HLS):
The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/75W
Lighting Wattage – 37
Luminous flux output (Lumens): 2900
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 4
Battery type/capacity-Lead Acid Battery/110Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

29. Super Bright Home 9 HLS (Model Number – SB9HLS):
The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/75W
Lighting Wattage – 37
Luminous flux output (Lumens): 2900
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 9
Battery type/capacity-Lead Acid Battery/110Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

30. Smart Home 2 HLS (Model Number – SH2HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/12W
Lighting Wattage – 7.4
Luminous flux output (Lumens): 666
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):2
Battery type/capacity-Lead Acid Battery/15Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

31. Smart Home 6 HLS (Model Number – SH6HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/30W
Lighting Wattage – 22.8
Luminous flux output (Lumens): 2020
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):6
Battery type/capacity-Lead Acid Battery/30Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

32. Model Number – SHLS6):

The technical specifications of this product are –
The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/45W
Lighting Wattage – 30
Luminous flux output (Lumens): 2200
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 6
Battery type/capacity-Lead Acid Battery/30Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

33. Selco Shankara 4 Light (Model Number – SKD4CFL):

The technical specifications of this product are –
The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/20W
Lighting Wattage – 12.4
Luminous flux output (Lumens): 1010

Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 4
Battery type/capacity-Lead Acid Battery/30Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

c. Relevant dates for the VPA –

- a. The stoves under this VPA are implemented from 01/02/2013 to 24/09/2014. The solar lighting systems are implemented from 01/02/2013 to 07/12/2016.
- b. Commissioning – 29,937 Improved cookstoves and 56,342 Solar Lamps (19,974 solar lighting systems) are distributed till date under this VPA. The exact commissioning/installation dates for all the CEPs are mentioned in the Emission Reduction Calculation sheet for this VPA.
- c. 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 44,620 tCO₂e.

Please see end of this section (after details for VPA18) on how double counting is avoided for all VPAs under this PoA.

VPA5 - GS ID: GS11505

a. Purpose of the VPAs and the measures taken for GHG emission reductions or net GHG removals –

Purpose: Under the VPA, Micro Energy Credits works with PO – Shri Kshetra Dharmasthala Rural Development Project (SKDRDP), Evangelical Social Action Forum Microfinance (ESAF), Muthoot Microfin Ltd. (Muthoot), and Sarala Women Welfare Society (Sarala) 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, and financing solar lighting systems, and improved cook stoves for low income households and microentrepreneurs in different States of India including Karnataka (KA), Andhra Pradesh (AP), Assam (AS), Himachal Pradesh (HP), Jharkhand (JK), Odisha (OD), Rajasthan (RJ), Tamil Nadu (TN), Uttar Pradesh (UP), Uttarakhand (UK), West Bengal (WB), Maharashtra (MH) and Madhya Pradesh (MP) for improved cookstove and Karnataka (KA), Assam (AS), Bihar (BH), Kerala (KL), Gujarat (GJ), Madhya Pradesh (MP), Odisha (OD), Tamil Nadu (TN), Uttar Pradesh (UP), Haryana (HR), Jharkhand (JK), Rajasthan (RJ) and West Bengal (WB) for solar lighting systems. These products provide clean, renewable power for lighting and efficient energy for cooking. The total number of units implemented under this CPA till date is:

Improved cookstoves – 19,963

Solar Lamps – 86,220 (i.e. 81,045 Solar Lighting Systems)

b. 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 Smart Stove (GSSV3). Technical specifications are as follows –

Stove Body Size: 9.8" x 7.6" x 11.7"

Net weight: 2.5 kg

Average Life span under standard use conditions: 5 years

The rated thermal efficiency is 25.19%

Solar Lighting System:

The solar lighting system models implemented under this VPA are listed below along with their specifications-

1. Selco Eco Home 4 HLS (Model Number – EH4HLS)

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/10W

Lighting Wattage – 3.6

Luminous flux output (Lumens): 324
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):2
Battery type/capacity-Lead Acid Battery/15Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

2. Super Bright Home 2 HLS (Model Number – SB2HLS)

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/18W
Lighting Wattage – 12
Luminous flux output (Lumens): 1080
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):2
Battery type/capacity-Lead Acid Battery/20Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

3. Smart Home 4 HLS (Model Number – SH4HLS)

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/10W
Lighting Wattage – 16.8
Luminous flux output (Lumens): 1512
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):4
Battery type/capacity-Lead Acid Battery/30Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

4. Super Bright Home 4 HLS (Model Number – SB4HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/40W
Lighting Wattage – 32
Luminous flux output (Lumens): 2880
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):
Battery type/capacity-Lead Acid Battery/60Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours

Warranty – 1 year

5. Super Bright Home 8 HLS (Model Number – SB8HLS):

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/75W

Lighting Wattage – 32

Luminous flux output (Lumens): 2880

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps):

Battery type/capacity-Lead Acid Battery/110Ah, 12V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

6. Selco Eco Home 2 HLS (Model Number – EH2HLS)

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/10W

Lighting Wattage – 3.6

Luminous flux output (Lumens): 324

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps):2

Battery type/capacity-Lead Acid Battery/15Ah, 12V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

7. Super Bright Home 6 HLS (Model Number – SB6HLS):

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/60W

Lighting Wattage – 46

Luminous flux output (Lumens): 4140

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps):6

Battery type/capacity-Lead Acid Battery/80Ah, 12V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

8. Bright Light Home 4 HLS (Model Number – BH4HLS):

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/40W

Lighting Wattage – 14

Luminous flux output (Lumens): 1260

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):2
Battery type/capacity-Lead Acid Battery/60Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

9. Super Bright Home 9 HLS (Model Number – SB9HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/75W
Lighting Wattage – 37
Luminous flux output (Lumens): 2900
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 9
Battery type/capacity-Lead Acid Battery/110Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

10. Selco 10 HLS (Model Number - S10HLS)

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/100W
Lighting Wattage – 60
Luminous flux output (Lumens): 5400
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 8
Battery type/capacity-Lead Acid Battery/150Ah,12 V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

11. Super Bright Home 15 HLS (Model Number – S15HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/120W
Lighting Wattage – 91
Luminous flux output (Lumens): 4700
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 12
Battery type/capacity-Lead Acid Battery/120Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

12. RAL Duron Mitva – MS322A

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/1.7W

Lighting Wattage – 1

Luminous flux output (Lumens): 85

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 1

Battery type/capacity-Lead Acid Battery/2.6Ah,3.7 V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

13. RAL Duron Mitva – MS322B

Type and Solar Panel Wattage: Polycrystalline/2.5W

Lighting Wattage – 1

Luminous flux output (Lumens): 110

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 1

Battery type/capacity-Lead Acid Battery/5.2Ah,3.7 V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

14. RAL Duron Mitva – MS 16B

Type and Solar Panel Wattage: Polycrystalline/0.35W

Lighting Wattage – 0.5

Luminous flux output (Lumens): 50

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 1

Battery type/capacity-Lead Acid Battery/0.5Ah,3.2 V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

15. d.light M350+

Type and Solar Panel Wattage: monocrystalline/3.7W

Lighting Wattage – 3

Luminous flux output (Lumens): 130

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 1

Battery type/capacity-Lithium Ion/1.5Ah,6 V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

16. d.light S100

Type and Solar Panel Wattage: monocrystalline/1.5W

Lighting Wattage – 1

Luminous flux output (Lumens): 65

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 1

Battery type/capacity-LFP/0.8Ah,3.2 V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

17. d.light S320

Type and Solar Panel Wattage: monocrystalline/1.5W

Lighting Wattage – 3

Luminous flux output (Lumens): 120

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 1

Battery type/capacity-LFP/1.8Ah,4.2 V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

18. d.light S20

Type and Solar Panel Wattage: monocrystalline/0.3W

Lighting Wattage – 0.5

Luminous flux output (Lumens): 29

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 1

Battery type/capacity-LFP/0.4Ah,3.2 V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

19. Greenlight Planet Pro2 (Sunking Pro2)

Type and Solar Panel Wattage: Polycrystalline/3W

Lighting Wattage –

Luminous flux output (Lumens): 150

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 1

Battery type/capacity-LFP/3Ah,3.3 V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

c. Relevant dates for the VPA –

a. Construction/Implementation date – The improved cookstoves under this VPA are implemented from 02/01/2013 to 12/01/2015 and solar lighting systems are implemented from 29/11/2016 to 30/11/2018.

b. Commissioning – 19,963 Improved cookstoves and 86,220 solar lamps (81,045 solar lighting system) 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.

c. 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 CPA are 68,446 tCO₂e.

VPA7 - GS ID: GS11477

1. Purpose of the VPA(s) and the measures taken for GHG emission reductions or net GHG removals by sinks –

Purpose: Under the VPA, Micro Energy Credits works with PO – Evangelical Social Action Forum (ESAF), Bandhan Creation Private Limited (Bandhan) and Shri Kshetra Dharmasthala Rural Development Project (SKDRDP) to develop a successful and diversified clean energy lending program. The clean energy program addresses typical barriers for low income clients including education, price, finance, and supply and aftersales service. Micro Energy Credits trains the POs to implement the clean energy lending program, as well as a robust and transparent carbon credit monitoring and tracking system to quantify and record the volume of carbon emission reductions created through the clean energy program.

Measures taken: The CPA involves marketing, distributing, and financing solar lanterns and improved cook stoves for low income households and microentrepreneurs in the states of Karnataka (KA), Tamil Nadu (TN), Jharkhand (JK), Madhya Pradesh (MP),

Assam (AS), Bihar (BH), Chhattisgarh (CG), Odisha (OD), Tripura (TR), Uttar Pradesh (UP) and West Bengal (WB). These products provide renewable energy for lighting and efficient energy for cooking. The total number of units implemented under this CPA till date is:

Improved cookstoves – 28,495

Solar Lamps – 126,504 (i.e.46,822 Solar Lighting Systems)

2. 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 Smart Stove (GSSV3). Technical specifications are as follows –

Stove Body Size: 9.8" x 7.6" x 11.7"

Net weight: 2.5 kg

Average Life span under standard use conditions: 5 years

The rated thermal efficiency is 25.19%

Solar Lighting Systems:

The solar lamp models implemented under this CPA are listed below along with their specifications-

1. Selco Eco Home 2 HLS (Model Number – EH2HLS):

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/10W

Lighting Wattage – 3.6

Luminous flux output (Lumens): 324

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps):2

Battery type/capacity-Lead Acid Battery/15Ah, 12V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

2. Selco Eco Home 4 HLS (Model Number – EH4HLS):

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/10W

Lighting Wattage – 3.6

Luminous flux output (Lumens): 324

Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):2
Battery type/capacity-Lead Acid Battery/15Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

3. Selco Smart Home 4 HLS (Model Number – SH4HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/10W
Lighting Wattage – 16.8
Luminous flux output (Lumens): 1512
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):4
Battery type/capacity-Lead Acid Battery/30Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

4. Bright Light Home 4 HLS (Model Number – BH4HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/40W
Lighting Wattage – 14
Luminous flux output (Lumens): 1260
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):2
Battery type/capacity-Lead Acid Battery/60Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

5. Super Bright Home 14 HLS (Model Number – S14HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/120W
Lighting Wattage – 82
Luminous flux output (Lumens): 7380
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):10
Battery type/capacity-Lead Acid Battery/120Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

6. Super Bright Home 15 HLS (Model Number – S15HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/120W
Lighting Wattage – 91
Luminous flux output (Lumens): 4700
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 12
Battery type/capacity-Lead Acid Battery/120Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

7. Selco Super Bright HLS (Model Number – SB4HLS):
The technical specifications of this product are –
Type and Solar Panel Wattage: crystalline/40W
Lighting Wattage – 32
Luminous flux output (Lumens): 2880
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):
Battery type/capacity-/Lead-Acid batter/60Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

8. Super Bright Home 2 HLS (Model Number – SB2HLS):
The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/18W
Lighting Wattage – 12
Luminous flux output (Lumens): 1080
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):2
Battery type/capacity-Lead Acid Battery/20Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

9. Super Bright Home 6 HLS (Model Number – SB6HLS):
The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/60W
Lighting Wattage – 46
Luminous flux output (Lumens): 4140
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):6
Battery type/capacity-Lead Acid Battery/80Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours

Warranty – 1 year

10. Super Bright Home 8 HLS (Model Number – SB8HLS):

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/75W

Lighting Wattage – 32

Luminous flux output (Lumens): 2880

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 4

Battery type/capacity-Lead Acid Battery/110Ah, 12V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

11. Super Bright Home 9 HLS (Model Number – SB9HLS):

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/75W

Lighting Wattage – 37

Luminous flux output (Lumens): 2900

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 9

Battery type/capacity-Lead Acid Battery/110Ah, 12V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

12. SKDLT3

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/20W

Lighting Wattage – 15

Luminous flux output (Lumens): 1350

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 3

Battery type/capacity-/20Ah, 12V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

13. PLT6HLS

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/75W

Lighting Wattage – 40

Luminous flux output (Lumens): 3400

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 6
Battery type/capacity-Lead Acid Battery/80Ah,12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

14. PLT4HLS

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/60W
Lighting Wattage – 33
Luminous flux output (Lumens): 2750
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 3
Battery type/capacity- Lead Acid Battery /80Ah,12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

15. PLT3F1HLS

The technical specifications of this product are –
Type and Solar Panel Wattage: crystalline/60W
Lighting Wattage – 20
Luminous flux output (Lumens): 1700
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 3
Battery type/capacity- Lead Acid Battery /80Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

16. PL2LT8F2HLS

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/180W
Lighting Wattage – 85
Luminous flux output (Lumens): 6950
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 10
Battery type/capacity- Lead Acid Battery/180Ah,12 V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

17. PL2LT6F1HLS

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/120W
Lighting Wattage – 57

Luminous flux output (Lumens): 4750
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 8
Battery type/capacity- Lead Acid Battery /135Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

18. PL1LT5HLS

The technical specifications of this product are –
Type and Solar Panel Wattage: crystalline/80W
Lighting Wattage – 45
Luminous flux output (Lumens): 3750
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 6
Battery type/capacity-Lead Acid Battery/100Ah,12 V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

19. PL1LT3F2HLS

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/120W
Lighting Wattage – 22
Luminous flux output (Lumens): 1900
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 4
Battery type/capacity-Lead Acid Battery/100Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

20. PL1LT3F1HLS

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline /75W
Lighting Wattage – 22
Luminous flux output (Lumens): 1900
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 4
Battery type/capacity- Lead Acid Battery /80Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

21. CLT2HLS

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/40W
Lighting Wattage – 15
Luminous flux output (Lumens): 1250
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 2
Battery type/capacity-Lead Acid Battery/20Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

22. CLT2F1HLS

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/60W
Lighting Wattage – 15
Luminous flux output (Lumens):
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 2
Battery type/capacity-Lead Acid Battery/60Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

23. CLT1HLS

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/20W
Lighting Wattage – 5
Luminous flux output (Lumens): 450
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 1
Battery type/capacity-Lead Acid Battery/15Ah,12 V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

24. CL3LT1HLS2

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/40W
Lighting Wattage – 11
Luminous flux output (Lumens): 1050
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 4
Battery type/capacity-Lead Acid Battery/30Ah, 12V

Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

25. CL3LT1HLS

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/40W
Lighting Wattage – 11
Luminous flux output (Lumens): 1050
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 4
Battery type/capacity-Lead Acid Battery/20Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

26. CL2LT2HLS

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/40W
Lighting Wattage – 19
Luminous flux output (Lumens): 1650
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 4
Battery type/capacity-Lead Acid Battery/30Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

27. CL2HLS

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/20W
Lighting Wattage – 4
Luminous flux output (Lumens): 400
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 2
Battery type/capacity-Lead Acid Battery/15Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

28. CL1LT2HLS

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/40W
Lighting Wattage – 12
Luminous flux output (Lumens): 1100
Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 3
Battery type/capacity-Lead Acid Battery/20Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

29. CL1LT1F1HLS

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/40W
Lighting Wattage – 7
Luminous flux output (Lumens): 650
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 2
Battery type/capacity-Lead Acid Battery/60Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

30. Selco 10 HLS (Model Number - S10HLS)

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/100W
Lighting Wattage – 60
Luminous flux output (Lumens): 5400
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 8
Battery type/capacity-Lead Acid Battery/150Ah,12 V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

31. Greenlight Planet PRO 2 (Sunking Pro2)

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/3W
Lighting Wattage – 1.1
Luminous flux output (Lumens): 150Lumen maintenance (for 2,000 hours): 96%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 1
Battery type/capacity-Lead Acid Battery/3Ah,3.3 V
Type of charge controller -Active
Solar Run time(SRT): 5-6hours
Warranty – 1 year

32. Greenlight Planet Boom (Sunking Boom)

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/2.7W
Lighting Wattage – 3
Luminous flux output (Lumens): 160
Lumen maintenance (for 2,000 hours): 100%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 1
Battery type/capacity-Lead Acid Battery/3Ah,3.3 V
Type of charge controller -Active
Solar Run time(SRT): 6hours
Warranty – 1 year

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

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/12W
Lighting Wattage – 5.28
Luminous flux output (Lumens): 590
Lumen maintenance (for 2,000 hours): 94%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 3
Battery type/capacity-Lead Acid Battery/12Ah,3.3 V
Type of charge controller -Active
Solar Run time(SRT): 5hours
Warranty – 1 year

3. Relevant dates for the CPA –

- a. Construction/Implementation date – The improved stoves under this VPA are implemented from 03/06/2013 to 30/05/2015. The solar lighting systems under this VPA are implemented from 24/01/2017 to 20/06/2019.
- b. Commissioning – 28,495 Improved cookstoves and 126,504 solar lamps (46,822 solar lighting systems) are distributed till date under this VPA. The exact commissioning/installation dates for all the CEP's are mentioned in the Emission Reduction Calculation sheet for this CPA.
- c. 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.

4. 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 52,851 tCO₂e.

VPA8 - GS ID: GS11478

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

Purpose: Under the VPA, MicroEnergy Credits works with PO – Shri Kshethra Dharmasthala Rural Development Project (SKDRDP) and Canara Bank 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. MicroEnergy 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, and financing solar lighting systems and improved cook stoves for low income households and microentrepreneurs in different states of India.. These products provide renewable energy for lighting and efficient energy for cooking. The total number of units implemented under this CPA till date is:

Improved cookstoves – 23,337

Solar Lamps – 35,349 (i.e. 11,671 Solar Lighting Systems)

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

Improved Cookstove:

The Improved Cookstove model implemented under this CPA are the Grameen Greenway Smart Stove (GSSV3). Technical specifications are as follows –

Grameen Greenway Smart Stove:

Stove Body Size: 9.8" x 7.6" x 11.7"

Net weight: 2.5 kg

Average Life span under standard use conditions: 5 years

The rate of thermal efficiency – 25.19%

Solar lighting system:

The solar lighting system models implemented under this VPA are:

1. Selco Eco Home 2 HLS (Model Number – EH2HLS):

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/10W

Lighting Wattage – 3.6

Luminous flux output (Lumens): 324

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps):2

Battery type/capacity-Lead Acid Battery/15Ah, 12V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

2. Selco Eco Home 4 HLS (Model Number – EH4HLS):

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/10W

Lighting Wattage – 3.6

Luminous flux output (Lumens): 324

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps):2

Battery type/capacity-Lead Acid Battery/15Ah, 12V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

3. Selco Smart Home 4 HLS (Model Number – SH4HLS):

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/10W

Lighting Wattage – 16.8

Luminous flux output (Lumens): 1512

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps):4

Battery type/capacity-Lead Acid Battery/30Ah, 12V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

4. Bright Light Home 4 HLS (Model Number – BH4HLS):

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/40W
Lighting Wattage – 14
Luminous flux output (Lumens): 1260
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):2
Battery type/capacity-Lead Acid Battery/60Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

5. Super Bright Home 10 HLS (Model Number – S10HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/100W
Lighting Wattage – 60
Luminous flux output (Lumens): 5400
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):8
Battery type/capacity-Lead Acid Battery/150Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

6. Super Bright Home 14 HLS (Model Number – S14HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/120W
Lighting Wattage – 82
Luminous flux output (Lumens): 7380
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):10
Battery type/capacity-Lead Acid Battery/120Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

7. Super Bright Home 15 HLS (Model Number – S15HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/**W
Lighting Wattage – 91
Luminous flux output (Lumens): 4700
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): **
Battery type/capacity-Lead Acid Battery/**Ah,** V

Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

8. Super Bright Home 2 HLS (Model Number – SB2HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/18W
Lighting Wattage – 12
Luminous flux output (Lumens): 1080
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):2
Battery type/capacity-Lead Acid Battery/20Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

9. Super Bright Home 6 HLS (Model Number – SB4HLS)

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/40W
Lighting Wattage – 32
Luminous flux output (Lumens): 2880
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps): 4
Battery type/capacity-Lead Acid Battery/60Ah,12 V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

10.Super Bright Home 6 HLS (Model Number – SB6HLS):

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/60W
Lighting Wattage – 46
Luminous flux output (Lumens): 4140
Lumen maintenance (for 2,000 hours): 95.75%
Rated lamp life: greater than 10,000 hours
Lighting point (number of project lamps):6
Battery type/capacity-Lead Acid Battery/80Ah, 12V
Type of charge controller -PMW
Solar Run time(SRT): 4-5hours
Warranty – 1 year

11. Super Bright Home 8 HLS (Model Number – SB8HLS):

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/75W

Lighting Wattage – 32

Luminous flux output (Lumens): 2880

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 4

Battery type/capacity-Lead Acid Battery/110Ah,12 V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

12. Super Bright Home 9 HLS (Model Number – SB9HLS):

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/W

Lighting Wattage – 37

Luminous flux output (Lumens): 2900

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 9

Battery type/capacity-Lead Acid Battery

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

c. Warranty – 1 year **Relevant dates for the CPA –**

a. Construction/Implementation date – The stoves under this VPA are implemented from 09/01/2015 to 16/02/2017. The solar lighting systems under this CPA are implemented from 2/03/2015 to 25/05/2018.

b. Commissioning – 23,337 Improved cookstoves and 35,349 solar lamps (11,671 solar lighting systems) are distributed till date under this VPA. The exact commissioning/installation dates for all the CEP's are mentioned in the Emission Reduction Calculation sheet for this VPA.

c. 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 CPA is 41,172 tCO₂e.

VPA11 - GS ID: GS11481

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 – Evangelical Social Action Forum (ESAF), Muthoot Microfin Limited (Muthoot) 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, and financing solar lighting systems, and improved cook stoves for low income households and microentrepreneurs in Karnataka (KA), Maharashtra (MH), Kerala (KL), Gujarat (GJ), Madhya Pradesh (MP), Odisha (OD), Uttar Pradesh (UP) and Tamil Nadu (TN). These products provide clean, renewable power for lighting and efficient energy for cooking. The total number of units implemented under this VPA till date is:

Improved cookstoves – 14,220

Solar Lamps – 242,588 (i.e. 242,588 Solar Lighting Systems)

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

Improved Cookstove:

The Improved Cookstove model implemented under this VPA are the Grameen Greenway Smart Stove(GSSV3), Grameen Jumbo Stove (GJS) and ServalS PowerGram Stove. Technical specifications are as follows –

Grameen Greenway Smart Stove (GSSV3) -

Stove Body Size: 9.8" x 7.6" x 11.7"

Net weight: 2.5 kg

Average Life span under standard use conditions: 5 years

The rated thermal efficiency is 25.19%

Grameen 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%

ServalS PowerGram Stove (GJL) –

Stove Body Size – 31 cm X 30 cm X 30 cm

Net weight: 9 kg

Average Life span under standard use conditions: 5 years

The rated thermal efficiency is 40%

Solar lighting system:

The solar lighting system model implemented under this VPA is the Duron Mitva MS 322A.

Technical specifications are as follows –Type and Solar Panel Wattage:

Polycrystalline/1.7W

Lighting Wattage – 1

Luminous flux output (Lumens): 85

Lumen maintenance (for 2,000 hours): 95.75%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps):1

Battery type/capacity-Lithium ion/2.6Ah, 3.7V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

c. Relevant dates for the CPA –

a. Construction/Implementation date – The improved cookstoves under this CPA are implemented from 21/01/2014 to 12/05/2017. The solar lighting systems are implemented from 27/03/2015 to 30/11/2017.

b. Commissioning – 14,220 Improved cookstoves and 242,588 solar lamps (242,588 Solar lighting systems) are distributed till end of the 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.

c. 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 CPA, including information on how double counting is avoided -

The total GHG emission reductions achieved in this monitoring period for the VPA is 59,573 tCO₂e.

VPA13 - GS ID: GS11483

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

Purpose: Under the VPA, MicroEnergy Credits works with PO – Shri Kshetra Dharamsthala Rural Development Project (SKDRDP), Simpa Networks, Sarala Women Welfare Society (Sarala) and Arohan Financial Services Limited (Arohan) 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. MicroEnergy 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, and financing solar lighting systems, and improved cook stoves for low income households and microentrepreneurs in Karnataka(KA), Assam (AS), Bihar (BH), West Bengal (WB), Chhattisgarh (CG), Jharkhand (JK), Madhya Pradesh (MP), Odisha (OD) and Uttar Pradesh (UP). These products provide clean, renewable power for lighting and efficient energy for cooking. The total number of units implemented under this VPA till date is:

Improved cookstoves – 27,000

Solar lighting systems – 138,762

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

Improved Cookstove:

The Improved Cookstove model implemented under this VPA are the Grameen Greenway Smart Stove (GSSV3) and Grameen Jumbo Stove (GJS). Technical specifications are as follows –

Grameen Greenway Smart Stove (GSSV3) -

Stove Body Size: 9.8" x 7.6" x 11.7"

Net weight: 2.5 kg

Average Life span under standard use conditions: 5 years

The rated thermal efficiency is 25.19%

Grameen 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 system:

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

Solar lighting systems:

1. d.light S20

Luminosity - 29 lumen

Lighting Wattage - 0.5 Watt

Average Lifetime of product (in years) -

Module - 15 years

Battery - 8 years

Electronics - 5 years

2. d.light S320

Luminosity - 120 lumen

Lighting Wattage - 3 Watt

Average Lifetime of product (in years) -

Module - 15 years

Battery - 8 years

Electronics - 5 years

3. d.light M350+

Luminosity - 130 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

4. d.light S100

Luminosity – 65 lumen

Lighting Wattage – 1 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

5. Greenway Sunny Lantern :

Luminosity – 40 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

6. Greenway Sunny tubelight

Luminosity – 90 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

7. Barefoot Go 250:

Luminosity – 135 lumen

Lighting Wattage – 1.64 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

8. Greenlight Planet Solar Home Lighting System (Sunking HLS)

Luminosity – 400 lumen

Lighting Wattage – 2.64 Watt

Average Lifetime of product (in years) – 5

9. Greenlight Planet Pro2 (Sunking Pro2)

Luminosity – 150 lumen

Lighting Wattage – 1.1 Watt

Average Lifetime of product (in years) – 5

10. Spark Pro Ujala

Luminosity – 1320 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

11. Spark Pro breeze

Luminosity – 990 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

12. Magic TV P80

Luminosity – 990 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) – 5

13. SK1510

Luminosity – 2000 lumen

Lighting Wattage – 5 Watt

Average Lifetime of product (in years) – 5

14. SK1520

Luminosity – 4000 lumen

Lighting Wattage – 5 Watt

Average Lifetime of product (in years) – 5

15. SK1530

Luminosity – 6000 lumen

Lighting Wattage – 10 Watt

Average Lifetime of product (in years) – 5

16. Spark Pro Phantom

Luminosity –1320 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) – 5

17, Spark Pro Plus

Luminosity – 1008 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) – 5

18. Magic TV

Luminosity – 672 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) – 5

19. Phoenix 120

Luminosity – 672 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) – 5

20. PICO

Luminosity – 200 lumen

Lighting Wattage – 1 Watt

Average Lifetime of product (in years) – 5

21. Power80

Luminosity – 1008 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) – 5

22. SP 315

Luminosity – 5400 lumen

Lighting Wattage – 4 Watt

Average Lifetime of product (in years) – 5

23. SP Breeze

Luminosity –1008 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) – 5

24. SP Breeze 2.0

Luminosity –1008 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) – 5

25. SP Inverter

Luminosity – 2700 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) – 5

26. SP 100

Luminosity – 1800 lumen

Lighting Wattage – 2 Watt

Average Lifetime of product (in years) – 5

27. SP 50

Luminosity – 1008 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) – 5

28. Spark GO

Luminosity – 1008 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) – 5

29. Spark Pro

Luminosity – 1800 lumen

Lighting Wattage – 2 Watt

Average Lifetime of product (in years) – 5

30. SK150

Luminosity – 1125 lumen

Lighting Wattage – 2.5 Watt

Average Lifetime of product (in years) – 5

31. Turbo

Luminosity – 1008 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) – 5

32. Turbo 120

Luminosity – 1008 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) – 5

33. Turbo 240

Luminosity – 1008 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) – 5

34. Turbo 80

Luminosity – 672 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) – 5

35. Power 55

Luminosity – 750 lumen

Lighting Wattage – 2.5 Watt

Average Lifetime of product (in years) – 5

36. PowerMax

Luminosity – 400 lumen

Lighting Wattage – 1 Watt

Average Lifetime of product (in years) – 5

37. Power Plus

Luminosity –1080 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) – 5

38. Power Lite

Luminosity – 1008 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) – 5

39. SP200

Luminosity – 3600 lumen

Lighting Wattage – 4 Watt

Average Lifetime of product (in years) – 5

40. Turbo Classic

Luminosity – 1008 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) – 5

41. Spark Series

Luminosity – 1125 lumen

Lighting Wattage – 2.5 Watt

Average Lifetime of product (in years) – 5

42. Star 200 4L+F

Luminosity – 720 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) – 5

43. SP Inverter 200

Luminosity – 2700 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) – 5

44. SP_Inverter_100_12M

Luminosity – 1800 lumen

Lighting Wattage – 2 Watt

Average Lifetime of product (in years) – 5

45. SP Inverter 100

Luminosity – 1800 lumen

Lighting Wattage – 2 Watt

Average Lifetime of product (in years) – 5

46. Ujala 2.0

Luminosity – 1980 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) – 5

47. Ujala Breeze

Luminosity – 1400 lumen

Lighting Wattage – 2 Watt

Average Lifetime of product (in years) – 5

48. Sunverter 1530

Luminosity – 4200 lumen

Lighting Wattage – 7 Watt

Average Lifetime of product (in years) – 5

49. d.light S500

Luminosity – 240 lumen

Lighting Wattage – 1 Watt

Average Lifetime of product (in years) – 5

Module – 15 years

Battery – 8 years

Electronics – 5 years

50. d.light S450

Luminosity – 170 lumen

Lighting Wattage – 3 Watt

Average Lifetime of product (in years) – 5

Module – 15 years

Battery – 8 years

Electronics – 5 years

51. d.light ST100

Luminosity – 220 lumen

Lighting Wattage – 1 Watt

Average Lifetime of product (in years) – 5

Module – 15 years

Battery – 8 years

Electronics – 5 years

c. Relevant dates for the VPA –

a. Construction/Implementation date – The improved cookstoves under this VPA for this monitoring period are implemented from 11/08/2017 to 05/09/2018. The solar lighting systems are implemented from 01/01/2014 to 20/06/2019.

b. Commissioning – 27,000 Improved cookstoves and 138,762 Solar lighting systems were distributed till the end of monitoring date of this report under this VPA. The exact commissioning/installation dates for all the CEPs are mentioned in the Emission Reduction Calculation sheet for this VPA.

c. 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 152,786 tCO₂.

VPA17 - GS ID: GS11451

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'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 in the State of Karnataka. 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 – 26,921

Solar Lighting systems – No solar lighting systems are installed till date.

b. 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%

c. Relevant dates for the VPA –

1. Construction/Implementation date – The improved cookstoves under this VPA are implemented from 05/09/2018 to 04/12/2018.
2. Commissioning – 26,921 Improved cookstoves are distributed till the end of monitoring period under this VPA. The exact commissioning/installation dates for all the CEPs are mentioned in the Emission Reduction Calculation sheet for this VPA.
3. Continued operation periods – All of the functional products were continuously operational during the course of this monitoring period. Non-functional products are discounted in emission reduction calculation.

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 68,813 tCO₂e.

VPA18 - GS ID: GS11486

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'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 in the State of Karnataka. 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 – 26,080

Solar Lighting systems – No solar lighting systems are installed till date.

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

Improved Cookstove:

The Improved Cookstove model implemented under this CPA are the Grameen Greenway Smart Stove (GSSV3) and Grameen Greenway Jumbo Stove (GJS). Technical specifications are as follows –

Grameen Greenway Smart Stove (GSSV3)

Stove Body Size: 9.8" x 7.6" x 11.7"

Net weight: 2.5 kg

Average life span under standard use conditions: 5 years

The rated thermal efficiency is 25.19%

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%

c. Relevant dates for the VPA –

a. Construction/Implementation date – The improved cookstoves under this VPA are implemented from 22/08/2018 to 22/02/2019.

b. Commissioning – 26,080 Improved cookstoves are distributed till the end of monitoring period under this VPA. The exact commissioning/installation dates for all the CEP's are mentioned in the Emission Reduction Calculation sheet for this VPA.

c. 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 CPA is 66,392 tCO₂e.

e. Avoiding double counting –

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

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

Partner	Unique Identification number for the households	Unique identification number for the CEP
SKDRDP	Group Identification number-Member ID	Branch ID-Loan account number
Sarala	Customer identification number	Transaction identification number
Muthoot	Customer identification number	Transaction identification number
ESAF	User account number	Branch ID-Loan account number
Bandhan	Customer identification number	Transaction identification number
Canara	Account number	CSA number on application
Arohan	Customer identification number	Loan identification number
Simpa	Customer identification number	Transaction identification number

Unique identification number for the households is defined as “Group identification number-Member ID” and Unique identification number for the CEPs is defined as “BranchID-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

>>

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 ($U_{p,y}$), percentage of lamp operating ($OF_{y,i,j}$), 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	Values
	VPA 04	Karnataka	7.02
	VPA 05	Karnataka	7.77
	VPA 07	Karnataka Tamil Nadu Chhattisgarh Madhya Pradesh	6.99 6.85 6.99 7.13
	VPA 08	Karnataka	7.11
	VPA 11	Karnataka Kerala Maharashtra Tamil Nadu	7.13 6.93 7.19 7.14
	VPA 13	Karnataka	6.99
	VPA 17	Karnataka	7.12
	VPA 18	Karnataka	7.01
	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,CO_2}
Unit	tCO ₂ /t _{fuel}
Description	CO ₂ emission factor arising from use of fuel type <i>i</i> in baseline scenario
Source of data	Wood: Methodology default
Value(s) applied	Fuelwood / wood chips: 112 tCO ₂ /TJ

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	EF _{b,i,nonCO2}				
Unit	tCO ₂ /tfuel				
Description	Non-CO ₂ emission factor arising from use of fuel type i in baseline scenario				
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	Wood: 37.25 tCO2e/TJ				
Choice of data or Measurement methods and procedures	Methodology defaults have been applied for wood				
	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-CO2}		37.25	tCO2/TJ	
Purpose of data	For baseline emission calculations				
Additional comment	-				

Data/parameter	EF _{p,i,CO2}
Unit	tCO ₂ /t _{fuel}
Description	CO ₂ emission factor arising from use of fuel type i in project scenario
Source of data	Wood: Methodology default
Value(s) applied	Fuelwood / wood chips: 112 tCO ₂ /TJ
Choice of data or Measurement methods and procedures	Default IPCC values have been applied
Purpose of data	For project emission calculations
Additional comment	-

Data/parameter	EF _{p,i,nonCO2}
----------------	--------------------------

Unit	tCO ₂ /TJ				
Description	Non-CO ₂ emission factor arising from use of fuel type <i>i</i> used in project scenario				
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 tCO ₂ e/TJ (AR5 GWP)				
Choice of data or Measurement methods and procedures	Default methodology values have been applied for wood				
	Parameter	Value	Average	Units	Source
	EF_wood_CH4	258 – 2190	1224	kgCO ₂ /TJ	
	EF_wood_N2O	4 – 18.5	11.25	KgCO ₂ /TJ	
	GWP CH4	28		tCO ₂ /TJ	AR5
	GWP N2O	265		tCO ₂ /TJ	AR5
	EF _{b,fuel non-CO2}		37.25	tCO ₂ /TJ	
Purpose of data	For project emission calculations				
Additional comment	-				

Data/parameter	NCV _{b,i}
Unit	TJ/tonne
Description	Net calorific value of the fuel type <i>i</i> used in the baseline
Source of data	Methodology default: Wood
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>i</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>i</i> that can be established as non-renewable during year <i>y</i>																																															
Source of data	Calculation as per CDM methodology Tool 30 version 3.0																																															
Value(s) applied	<table><tr><th>VPA Number</th><th>State</th><th>Value</th></tr><tr><td>VPA 04</td><td>Karnataka</td><td>0.86</td></tr><tr><td>VPA 05</td><td>Karnataka</td><td>0.86</td></tr><tr><td>VPA 07</td><td>Karnataka</td><td>0.86</td></tr><tr><td></td><td>Tamil Nadu</td><td>0.913</td></tr><tr><td></td><td>Chhattisgarh</td><td>0.814</td></tr><tr><td></td><td>Madhya Pradesh</td><td>0.914</td></tr><tr><td>VPA 08</td><td>Karnataka</td><td>0.86</td></tr><tr><td>VPA 11</td><td>Karnataka</td><td>0.86</td></tr><tr><td></td><td>Kerala</td><td>0.874</td></tr><tr><td></td><td>Maharashtra</td><td>0.913</td></tr><tr><td></td><td>Tamil Nadu</td><td>0.913</td></tr><tr><td>VPA 13</td><td>Karnataka</td><td>0.86</td></tr><tr><td>VPA 17</td><td>Karnataka</td><td>0.86</td></tr><tr><td>VPA 18</td><td>Karnataka</td><td>0.86</td></tr></table>			VPA Number	State	Value	VPA 04	Karnataka	0.86	VPA 05	Karnataka	0.86	VPA 07	Karnataka	0.86		Tamil Nadu	0.913		Chhattisgarh	0.814		Madhya Pradesh	0.914	VPA 08	Karnataka	0.86	VPA 11	Karnataka	0.86		Kerala	0.874		Maharashtra	0.913		Tamil Nadu	0.913	VPA 13	Karnataka	0.86	VPA 17	Karnataka	0.86	VPA 18	Karnataka	0.86
VPA Number	State	Value																																														
VPA 04	Karnataka	0.86																																														
VPA 05	Karnataka	0.86																																														
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	Maharashtra	0.913																																														
	Tamil Nadu	0.913																																														
VPA 13	Karnataka	0.86																																														
VPA 17	Karnataka	0.86																																														
VPA 18	Karnataka	0.86																																														
Choice of data or Measurement methods and procedures	N.A.																																															
Purpose of data	For emission reduction calculations																																															
Additional comment	-																																															

For Solar Lighting Systems

VPA 04, 05, 07, 08, 11 (AMS III A.R)

Data/parameter	DV
Unit	tCO ₂ e per project lamp
Description	Lamp Emission Factor
Source of data	Default value prescribed in AMS-III.AR (v7.0)
Value(s) applied	0.092 tCO ₂ e per project lamp

Choice of data or Measurement methods and procedures	Methodology default value applied
Purpose of data	Calculation of baseline emissions
Additional comment	N/A

VPAs 13, 17, and 18 (AMS I.A)

Data/parameter	LE_{ker}
Unit	Lumen/W
Description	The specific luminous efficiency of kerosene when burnt in a kerosene lantern
Source of data	Jean-Paul Louineau, Modibo Dicko, Peter Fraenkel, Roy Barlow and Varis Bokalders; Rural Lighting: A Guide for Development Workers, Intermediate Technology (IT) Publications in association with The Stockholm Environment Institute 1994
Value(s) applied	0.13
Choice of data or Measurement methods and procedures	Louineau et al (1994) state an efficiency range of 0.05 to 0.21 lumens/W for hurricane kerosene lanterns. Another study by the World Bank states an efficiency of 0.1 lumen/W for hurricane lanterns. Values for the widely used homemade wick lamps are scarcely available as designs vary. Anyway, these lamps have much lower efficiencies than hurricane lanterns. It is assumed that the kerosene lamp model in the baseline is a hurricane lamp. This is conservative since the vast majority of households use self-made kerosene lanterns without a glass cover, which are less efficient due to wind disturbance and very basic design. The average efficiency value of 0.13 lumen/watt for hurricane lamps from Louineau et al (1994) is chosen, being conservative with respect to the lower value of 0.1 lumen/W provided by the World Bank.
Purpose of data	Calculation of baseline emissions
Additional comment	The parameter is fixed for the entire crediting period.

Data/parameter	EF_{ker}
Unit	tCO ₂ /GJ
Description	The specific CO ₂ emissions of kerosene

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

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

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
	VPA4	Smart/KA	3.6
	VPA5	Smart/KA	3.6
	VPA7	Smart/KA	3.4
		Smart/CG	3.4
		Smart/MP	3.3
		Smart/TN	3.2

	VPA8	Smart/KA	3.5
	VPA11	Smart/KA	3.4
		Jumbo/KA	3.4
		Jumbo/KL	3.6
		Smart/MH	3.7
		Powergram/TN	3.4
	VPA13	Smart/KA	3.1
		Jumbo/KA	2.6
Measurement methods and procedures	VPA17	Jumbo/KA	3.2
	VPA18	Jumbo/KA	3.0
		Smart/KA	2.9
Measurement methods and procedures	Project KPT has been conducted		
Monitoring frequency	Updated every two years		
QA/QC procedures	CME has provided guidance and training to enumerators/experts for conducting KPTs to meet specific requirement of the methodology. The equipment used for testing is externally calibrated or newly purchased at the time of use so measurements are done with the necessary guarantees. Calibration of the equipment is done annually. Type – Digital Moisture Meter Accuracy Class - +/- 1% Serial number – TM157341, TM157285, TM28591, TM240016, TM28657, TM240017, TM28618, TM239929, TM157277 Calibration frequency – Annual Date of calibration – 19/02/2021 Validity – Until 18/02/2022 Serial number – X014064, X014086, X013975, X014073, X014104, X014102, X014082, X014049, Calibration frequency – Annual Date of calibration – 16/12/2021 Validity – Until 15/12/2022 Type - Weighing Scale Accuracy Class - +/- 0.5 grams Serial number – WS00120, WS00123, WS12012, WS00132, WS00156, WS00151, WS00153, WS00436, WS00136, Calibration frequency – Annual Date of calibration – 15/02/2021 Validity – Until 14/02/2022		

	Serial number – WB01, WB02, WB03, WB04, WB06, WB07, WB08 Calibration frequency – Annual Date of calibration – 17/12/2021 Validity – Until 16/12/2022
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	
	VPA4	Smart/KA	57%	
	VPA7	Smart/KA	61%	
		Smart/CG	51%	
		Smart/MP	58%	
		Smart/TN	65%	
	VPA8	Smart/KA	61%	
	VPA17	Jumbo/KA	86%	
	VPA18	Jumbo/KA	83%	
		Smart/KA	85%	
	For Monitoring Period: 01/01/2021 to 31/12/2021			
	For Monitoring Period: 27/06/2020 to 31/12/2021			
	VPA	Model/State	Values-Yr1	Values-Yr2
VPA5	Smart/KA	56%	54%	
VPA11	Smart/KA	74%	68%	
	Jumbo/KA	55%	53%	
	Jumbo/KL	66%	62%	
	Smart/MH	66%	61%	
	Powergram/TN	66%	60%	
VPA13	Smart/KA	76%	70%	
	Jumbo/KA	76%	71%	
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 has been 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. The "Cookstove Usage Rate Guidelines" has been followed and CME has ensured that the value applied for this parameter is in line with the guidance provided for the Level applied. Out of the three levels to the Usage Monitoring Requirements, CME has ensured "Mandatory" and "Good Practice" level are complied with.
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. POs conduct regular training events for the end users and the information is captured in reports submitted to CME as part of contract between PO and CME.
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

	VPA4	Smart/KA	29,937
	VPA5	Smart/KA	19,963
	VPA7	Smart/KA Smart/CG Smart/MP Smart/TN	23,337 2,492 1,689 977
	VPA8	Smart/KA	23,337
	VPA11	Smart/KA Jumbo/KA Jumbo/KL Smart/MH Powergram/TN	34 555 4,950 7,353 1,328
	VPA13	Smart/KA	27,000
	VPA17	Jumbo/KA	26,921
	VPA18	Jumbo/KA Smart/KA	26,000 80
	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 ₂ e per year		
Description	Leakage in project scenario p during year y		
Source of data	Monitoring surveys for Leakage assessment		
Value(s) applied	VPA	Model/State	Values
	VPA4	Smart/KA	0
	VPA5	Smart/KA	0
	VPA7	Smart/KA Smart/CG Smart/MP Smart/TN	0 0 0 0
	VPA8	Smart/KA	0
	VPA11	Smart/KA Jumbo/KA Jumbo/KL Smart/MH Powergram/TN	0 0 0 0 0

	VPA13	Smart/KA	0
	VPA17	Jumbo/KA	0
	VPA18	Jumbo/KA	0
		Smart/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

VPA 04-GS 11476

SDG 13

Data / Parameter	Ni,j																				
Unit	Number																				
Description	Number of project lamps distributed to end users of type i with charging method j																				
Source of data	MEC tracker platform																				
Value(s) applied	<table><tr><th>Year</th><th>State</th><th>Total Lamps</th></tr><tr><td>2013</td><td>Karnataka</td><td>7,342</td></tr><tr><td>2014</td><td>Karnataka</td><td>10,341</td></tr><tr><td>2015</td><td>Karnataka</td><td>24,660</td></tr><tr><td>2016</td><td>Karnataka</td><td>13,999</td></tr><tr><td colspan="2">Total</td><td>56,342</td></tr></table>			Year	State	Total Lamps	2013	Karnataka	7,342	2014	Karnataka	10,341	2015	Karnataka	24,660	2016	Karnataka	13,999	Total		56,342
Year	State	Total Lamps																			
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2016	Karnataka	13,999																			
Total		56,342																			
Measurement methods and procedures	The data has been recorded in a web based tracker platform. The data consists of unique number, number of units sold, to whom and where																				
Monitoring frequency	Annual																				
QA/QC procedures	Each solar lighting system, and number of solar lamps in each system, has been recorded in the MEC Tracker System. Associated data resides in the MEC Tracker Database, allowing each installation to be monitored.																				
Purpose of data	Calculation of project emissions																				
Additional comment	-																				

Data/parameter	GF _y
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Unit	Fraction
Description	Grid Factor in year y
Source of data	Default value prescribed in AMS-III.AR (v7.0)
Value(s) applied	1.0
Choice of data or Measurement methods and procedures	Methodology default value applied
Purpose of data	Calculation of baseline emissions
Additional comment	N/A

Data/parameter	DB _y
Unit	-
Description	Dynamic Baseline Factor (change in baseline fuel, fuel use rate, and/or utilization during crediting period) in year y
Source of data	Default value prescribed in AMS-III.AR (v7.0)
Value(s) applied	1.0
Choice of data or Measurement methods and procedures	Methodology default value applied
Purpose of data	Calculation of baseline emissions
Additional comment	N/A

Data / Parameter	OF _{y,i,j}		
Unit	Fraction		
Description	The percentage of project lamps distributed to end users that are operating and in service		
Source of data	-		
Value(s) applied	Installation year	Crediting Period 2	
		Year 1	Year 2
	2013	0.68	0.68
	2014	0.72	0.72
	2015	0.72	0.72
	2016	0.77	0.77

Measurement methods and procedures	Default value for the first three years of operation of a lamp as per the methodology. Post three years, for years 4-7, this value will be determined on the basis of sampling survey carried out in year 3.
Monitoring frequency	Default value for three years. Determined based on survey conducted in year 3 for years 4-7
QA/QC procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

VPA 05-GS 11505

Data / Parameter	N _{i,j}																																																									
Unit	Number																																																									
Description	Number of project lamps distributed to end users of type i with charging method j																																																									
Source of data	MEC tracker platform																																																									
Value(s) applied	<table><tr><th>Year</th><th>State</th><th>Total Lamps</th></tr><tr><td rowspan="2">2016</td><td>Karnataka</td><td>3,894</td></tr><tr><td></td><td></td></tr><tr><td rowspan="10">2017</td><td>Assam</td><td>180</td></tr><tr><td>Bihar</td><td>273</td></tr><tr><td>Gujarat</td><td>1,818</td></tr><tr><td>Karnataka</td><td>6,321</td></tr><tr><td>Kerala</td><td>11,706</td></tr><tr><td>Madhya Pradesh</td><td>448</td></tr><tr><td>Odisha</td><td>1,866</td></tr><tr><td>Tamil Nadu</td><td>5,584</td></tr><tr><td>Uttar Pradesh</td><td>1</td></tr><tr><td>West Bengal</td><td>4,525</td></tr><tr><td rowspan="11">2018</td><td>Gujarat</td><td>5,349</td></tr><tr><td>Haryana</td><td>108</td></tr><tr><td>Jharkhand</td><td>2</td></tr><tr><td>Karnataka</td><td>5,830</td></tr><tr><td>Kerala</td><td>12,882</td></tr><tr><td>Madhya Pradesh</td><td>1,279</td></tr><tr><td>Odisha</td><td>3,075</td></tr><tr><td>Rajasthan</td><td>3</td></tr><tr><td>Tamil Nadu</td><td>19,884</td></tr><tr><td>Uttar Pradesh</td><td>92</td></tr><tr><td>West Bengal</td><td>1,100</td></tr><tr><td colspan="2">Total</td><td>86,220</td></tr></table>			Year	State	Total Lamps	2016	Karnataka	3,894			2017	Assam	180	Bihar	273	Gujarat	1,818	Karnataka	6,321	Kerala	11,706	Madhya Pradesh	448	Odisha	1,866	Tamil Nadu	5,584	Uttar Pradesh	1	West Bengal	4,525	2018	Gujarat	5,349	Haryana	108	Jharkhand	2	Karnataka	5,830	Kerala	12,882	Madhya Pradesh	1,279	Odisha	3,075	Rajasthan	3	Tamil Nadu	19,884	Uttar Pradesh	92	West Bengal	1,100	Total		86,220
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Measurement methods and procedures	The data has been recorded in a web based tracker platform. The data consists of unique number, number of units sold, to whom and where
Monitoring frequency	Annual
QA/QC procedures	Each solar lighting system, and number of solar lamps in each system, has been recorded in the MEC Tracker System. Associated data resides in the MEC Tracker Database, allowing each installation to be monitored.
Purpose of data	Calculation of project emissions
Additional comment	-

Data/parameter	GF _y
Unit	Fraction
Description	Grid Factor in year y
Source of data	Default value prescribed in AMS-III.AR (v7.0)
Value(s) applied	1.0
Choice of data or Measurement methods and procedures	Methodology default value applied
Purpose of data	Calculation of baseline emissions
Additional comment	N/A

Data/parameter	DB _y
Unit	-
Description	Dynamic Baseline Factor (change in baseline fuel, fuel use rate, and/or utilization during crediting period) in year y
Source of data	Default value prescribed in AMS-III.AR (v7.0)
Value(s) applied	1.0
Choice of data or Measurement methods and procedures	Methodology default value applied
Purpose of data	Calculation of baseline emissions
Additional comment	N/A

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Value(s) applied	<table><tr><th>Installation year</th><th>State</th><th colspan="2">Crediting Period 2</th></tr><tr><td></td><td></td><th>Year 1</th><th>Year 2</th></tr><tr><td>2017</td><td>Assam</td><td>0.88</td><td>0.88</td></tr><tr><td>2017</td><td>Bihar</td><td>0.85</td><td>0.85</td></tr><tr><td>2017</td><td>Gujarat</td><td>0.83</td><td>0.83</td></tr><tr><td>2018</td><td>Gujarat</td><td>0.85</td><td>0.85</td></tr><tr><td>2018</td><td>Haryana</td><td>0.85</td><td>0.85</td></tr><tr><td>2018</td><td>Jharkhand</td><td>1.0</td><td>1.0</td></tr><tr><td>2016</td><td>Karnataka</td><td>0.78</td><td>0.78</td></tr><tr><td>2017</td><td>Karnataka</td><td>0.84</td><td>0.84</td></tr><tr><td>2018</td><td>Karnataka</td><td>0.85</td><td>0.85</td></tr><tr><td>2017</td><td>Kerala</td><td>0.79</td><td>0.79</td></tr><tr><td>2018</td><td>Kerala</td><td>1.0</td><td>1.0</td></tr><tr><td>2018</td><td>Madhya Pradesh</td><td>0.83</td><td>0.83</td></tr><tr><td>2018</td><td>Madhya Pradesh</td><td>0.82</td><td>0.82</td></tr><tr><td>2017</td><td>Odisha</td><td>0.83</td><td>0.83</td></tr><tr><td>2018</td><td>Odisha</td><td>0.86</td><td>0.86</td></tr><tr><td>2018</td><td>Rajasthan</td><td>1.0</td><td>1.0</td></tr><tr><td>2017</td><td>Tamil Nadu</td><td>0.79</td><td>0.79</td></tr><tr><td>2018</td><td>Tamil Nadu</td><td>0.81</td><td>0.81</td></tr><tr><td>2017</td><td>Uttar Pradesh</td><td>1.0</td><td>1.0</td></tr><tr><td>2018</td><td>Uttar Pradesh</td><td>0.86</td><td>0.86</td></tr><tr><td>2017</td><td>West Bengal</td><td>0.82</td><td>0.82</td></tr><tr><td>2018</td><td>West Bengal</td><td>0.84</td><td>0.84</td></tr></table>				Installation year	State	Crediting Period 2				Year 1	Year 2	2017	Assam	0.88	0.88	2017	Bihar	0.85	0.85	2017	Gujarat	0.83	0.83	2018	Gujarat	0.85	0.85	2018	Haryana	0.85	0.85	2018	Jharkhand	1.0	1.0	2016	Karnataka	0.78	0.78	2017	Karnataka	0.84	0.84	2018	Karnataka	0.85	0.85	2017	Kerala	0.79	0.79	2018	Kerala	1.0	1.0	2018	Madhya Pradesh	0.83	0.83	2018	Madhya Pradesh	0.82	0.82	2017	Odisha	0.83	0.83	2018	Odisha	0.86	0.86	2018	Rajasthan	1.0	1.0	2017	Tamil Nadu	0.79	0.79	2018	Tamil Nadu	0.81	0.81	2017	Uttar Pradesh	1.0	1.0	2018	Uttar Pradesh	0.86	0.86	2017	West Bengal	0.82	0.82	2018	West Bengal	0.84	0.84
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Purpose of data	Calculation of baseline emissions																																																																																																			
Additional comment	-																																																																																																			

VPA 07-GS 11477

Data / Parameter	N _{i,j}																																																					
Unit	Number																																																					
Description	Number of project lamps distributed to end users of type i with charging method j																																																					
Source of data	MEC tracker platform																																																					
Value(s) applied	<table><tr><th>Year</th><th>State</th><th>Total Lamps</th></tr><tr><td rowspan="7">2017</td><td>Karnataka</td><td>26484</td></tr><tr><td>Assam</td><td>4106</td></tr><tr><td>Bihar</td><td>2553</td></tr><tr><td>Jharkhand</td><td>321</td></tr><tr><td>Odisha</td><td>394</td></tr><tr><td>West Bengal</td><td>48</td></tr><tr><td>Uttar Pradesh</td><td>103</td></tr><tr><td rowspan="7">2018</td><td>Karnataka</td><td>49763</td></tr><tr><td>Assam</td><td>4647</td></tr><tr><td>Bihar</td><td>2431</td></tr><tr><td>Jharkhand</td><td>585</td></tr><tr><td>Odisha</td><td>599</td></tr><tr><td>Tripura</td><td>867</td></tr><tr><td>West Bengal</td><td>20</td></tr><tr><td rowspan="7">2019</td><td>Karnataka</td><td>28691</td></tr><tr><td>Assam</td><td>2251</td></tr><tr><td>Bihar</td><td>1325</td></tr><tr><td>Jharkhand</td><td>238</td></tr><tr><td>Odisha</td><td>207</td></tr><tr><td>Tripura</td><td>481</td></tr><tr><td>West Bengal</td><td>26</td></tr><tr><td colspan="2">Total</td><td>126,504</td></tr></table>			Year	State	Total Lamps	2017	Karnataka	26484	Assam	4106	Bihar	2553	Jharkhand	321	Odisha	394	West Bengal	48	Uttar Pradesh	103	2018	Karnataka	49763	Assam	4647	Bihar	2431	Jharkhand	585	Odisha	599	Tripura	867	West Bengal	20	2019	Karnataka	28691	Assam	2251	Bihar	1325	Jharkhand	238	Odisha	207	Tripura	481	West Bengal	26	Total		126,504
Year	State	Total Lamps																																																				
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Data/parameter	GF _y
Unit	Fraction
Description	Grid Factor in year y
Source of data	Default value prescribed in AMS-III.AR (v7.0)
Value(s) applied	1.0
Choice of data or Measurement methods and procedures	Methodology default value applied
Purpose of data	Calculation of baseline emissions
Additional comment	N/A

Data/parameter	DB _y
Unit	-
Description	Dynamic Baseline Factor (change in baseline fuel, fuel use rate, and/or utilization during crediting period) in year y
Source of data	Default value prescribed in AMS-III.AR (v7.0)
Value(s) applied	1.0
Choice of data or Measurement methods and procedures	Methodology default value applied
Purpose of data	Calculation of baseline emissions
Additional comment	N/A

Data / Parameter	OF _{y,i,j}			
Unit	Fraction			
Description	The percentage of project lamps distributed to end users that are operating and in service			
Source of data	-			
Value(s) applied	Installation year	State	Crediting Period 2	
			Year 1	Year 2
	2017	Karnataka	0.71	0.71

	2018	Karnataka	0.76	0.76
	2019	Karnataka	0.78	0.78
	2017	Assam	0.69	0.69
	2018	Assam	0.75	0.75
	2019	Assam	0.79	0.79
	2017	Bihar	0.74	0.74
	2018	Bihar	0.82	0.82
	2019	Bihar	0.85	0.85
	2017	Jharkhand	0.77	0.77
	2018	Jharkhand	0.84	0.84
	2019	Jharkhand	0.83	0.83
	2017	Odisha	0.77	0.77
	2018	Odisha	0.82	0.82
	2019	Odisha	0.85	0.85
	2018	Tripura	0.83	0.83
	2019	Tripura	0.82	0.82
	2017	West Bengal	0.78	0.78
	2018	West Bengal	0.75	0.75
	2019	West Bengal	0.89	0.89
	2017	Uttar Pradesh	0.84	0.84
Measurement methods and procedures	Default value for the first three years of operation of a lamp as per the methodology. Post three years, for years 4-7, this value will be determined on the basis of sampling survey carried out in year 3.			
Monitoring frequency	Default value for three years. Determined on based of survey conducted in year 3 for years 4-7			
QA/QC procedures	-			
Purpose of data	Calculation of baseline emissions			
Additional comment	-			

VPA 08-GS 11478

Data / Parameter	N _{i,j}					
Unit	Number					
Description	Number of project lamps distributed to end users of type i with charging method j					
Source of data	MEC tracker platform					
Value(s) applied	<table><tr><th>Year</th><th>State</th><th>Total Lamps</th></tr></table>	Year	State	Total Lamps		
Year	State	Total Lamps				

	2017	Karnataka	19238
	2018	Karnataka	16111
	Total		35,349
Measurement methods and procedures	The data has been recorded in a web based tracker platform. The data consists of unique number, number of units sold, to whom and where		
Monitoring frequency	Annual		
QA/QC procedures	Each solar lighting system, and number of solar lamps in each system, has been recorded in the MEC Tracker System. Associated data resides in the MEC Tracker Database, allowing each installation to be monitored.		
Purpose of data	Calculation of project emissions		
Additional comment	-		

Data/parameter	GF _y
Unit	Fraction
Description	Grid Factor in year y
Source of data	Default value prescribed in AMS-III.AR (v7.0)
Value(s) applied	1.0
Choice of data or Measurement methods and procedures	Methodology default value applied
Purpose of data	Calculation of baseline emissions
Additional comment	N/A

Data/parameter	DB _y
Unit	-
Description	Dynamic Baseline Factor (change in baseline fuel, fuel use rate, and/or utilization during crediting period) in year y
Source of data	Default value prescribed in AMS-III.AR (v7.0)
Value(s) applied	1.0
Choice of data or Measurement methods and procedures	Methodology default value applied
Purpose of data	Calculation of baseline emissions

Additional comment	N/A
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Data / Parameter	OF _{y,i,j}			
Unit	Fraction			
Description	The percentage of project lamps distributed to end users that are operating and in service			
Source of data	-			
Value(s) applied	Installation year	State	Crediting Period 2	
			Year 1	Year 2
	2017	Karnataka	0.79	0.79
	2018	Karnataka	0.83	0.83
Measurement methods and procedures	Default value for the first three years of operation of a lamp as per the methodology. Post three years, for years 4-7, this value will be determined on the basis of sampling survey carried out in year 3.			
Monitoring frequency	Default value for three years. Determined on based of survey conducted in year 3 for years 4-7			
QA/QC procedures	-			
Purpose of data	Calculation of baseline emissions			
Additional comment	-			

VPA 11-GS 11481

Data / Parameter	Ni,j																							
Unit	Number																							
Description	Number of project lamps distributed to end users of type i with charging method j																							
Source of data	MEC tracker platform																							
Value(s) applied	<table><tr><th>Year</th><th>State</th><th>Total Lamps</th></tr><tr><td rowspan="4">2015</td><td>Karnataka</td><td>9,177</td></tr><tr><td>Kerala</td><td>50,375</td></tr><tr><td>Maharashtra</td><td>9,940</td></tr><tr><td>Tamil Nadu</td><td>26,883</td></tr><tr><td rowspan="4">2016</td><td>Karnataka</td><td>10,819</td></tr><tr><td>Kerala</td><td>39,162</td></tr><tr><td>Gujarat</td><td>3,246</td></tr><tr><td>Madhya Pradesh</td><td>293</td></tr></table>			Year	State	Total Lamps	2015	Karnataka	9,177	Kerala	50,375	Maharashtra	9,940	Tamil Nadu	26,883	2016	Karnataka	10,819	Kerala	39,162	Gujarat	3,246	Madhya Pradesh	293
Year	State	Total Lamps																						
2015	Karnataka	9,177																						
	Kerala	50,375																						
	Maharashtra	9,940																						
	Tamil Nadu	26,883																						
2016	Karnataka	10,819																						
	Kerala	39,162																						
	Gujarat	3,246																						
	Madhya Pradesh	293																						

		<i>Maharashtra</i>	8,053
		<i>Odisha</i>	15
		<i>Tamil Nadu</i>	45,325
		<i>Uttar Pradesh</i>	188
	2017	<i>Karnataka</i>	5,598
		<i>Kerala</i>	11,783
		<i>Gujarat</i>	1,875
		<i>Madhya Pradesh</i>	380
		<i>Maharashtra</i>	19
		<i>Odisha</i>	2,405
		<i>Tamil Nadu</i>	17,052
	<i>Total</i>		242,588
Measurement methods and procedures	The data has been recorded in a web based tracker platform. The data consists of unique number, number of units sold, to whom and where		
Monitoring frequency	Annual		
QA/QC procedures	Each solar lighting system, and number of solar lamps in each system, has been recorded in the MEC Tracker System. Associated data resides in the MEC Tracker Database, allowing each installation to be monitored.		
Purpose of data	Calculation of project emissions		
Additional comment	-		

Data/parameter	GF _y
Unit	Fraction
Description	Grid Factor in year y
Source of data	Default value prescribed in AMS-III.AR (v7.0)
Value(s) applied	1.0
Choice of data or Measurement methods and procedures	Methodology default value applied
Purpose of data	Calculation of baseline emissions
Additional comment	N/A

Data/parameter	DB _y
Unit	-

Description	Dynamic Baseline Factor (change in baseline fuel, fuel use rate, and/or utilization during crediting period) in year y
Source of data	Default value prescribed in AMS-III.AR (v7.0)
Value(s) applied	1.0
Choice of data or Measurement methods and procedures	Methodology default value applied
Purpose of data	Calculation of baseline emissions
Additional comment	N/A

Data / Parameter	OF _{y,i,j}				
Unit	Fraction				
Description	The percentage of project lamps distributed to end users that are operating and in service				
Source of data	-				
Value(s) applied	Installation year	State	Crediting Period 1		Crediting Period 2
			Year 4	Year 5	Year 1
	2015	Karnataka	0.73	0.73	0.73
	2016	Karnataka	0.76	0.76	0.76
	2017	Karnataka	0.81	0.81	0.81
	2015	Kerala	0.72	0.72	0.72
	2016	Kerala	0.74	0.74	0.74
	2017	Kerala	0.76	0.76	0.76
	2016	Gujarat	0.74	0.74	0.74
	2017	Gujarat	0.74	0.74	0.74
	2016	Madhya Pradesh	0.76	0.76	0.76
	2017	Madhya Pradesh	0.77	0.77	0.77
	2015	Maharashtra	0.76	0.76	0.76
	2016	Maharashtra	0.78	0.78	0.78
	2017	Maharashtra	0.79	0.79	0.79
	2016	Odisha	0.80	0.80	0.80
	2017	Odisha	0.85	0.85	0.85
	2015	Tamil Nadu	0.70	0.70	0.70
	2016	Tamil Nadu	0.79	0.79	0.79
	2017	Tamil Nadu	0.82	0.82	0.82

	2016	Uttar Pradesh	0.74	0.74	0.74
Measurement methods and procedures	Default value for the first three years of operation of a lamp as per the methodology. Post three years, for years 4-7, this value will be determined on the basis of sampling survey carried out in year 3.				
Monitoring frequency	Default value for three years. Determined on based of survey conducted in year 3 for years 4-7				
QA/QC procedures	-				
Purpose of data	Calculation of baseline emissions				
Additional comment	-				

VPA13 – GS11483

Data / Parameter	In
Unit	Lumens
Description	Lumen output of each solar lamp <i>n</i> deployed as part of project activity
Source of data	Table 4, 2021 value
Value(s) applied	1. d.Light M350+ – 140.538 (Manufacturer's specification is 130 Lumen which is more than threshold value of 140.538, hence 140.538 lumen value is considered) 2. d.Light S100 – 65 Lumen (Manufacturer's specification is 65 Lumen which is less than threshold value of 140.538, hence 65 lumen value is considered) 3. d.Light S20 – 29 Lumen (Manufacturer's specification is 29 Lumen which is less than threshold value of 140.538, hence 29 lumen value is considered) 4. d.Light S320 – 140.54 Lumen (Manufacturer's specification is 120 Lumen which is more than threshold value of 140.538, hence 140.538 lumen value is considered) 5. Greenlight Planet Pro2 (Sunking Pro2) – 140.54 Lumen (Manufacturer's specification is 150 Lumen which is more than threshold value of 140.538, hence 140.538 lumen value is considered) 6. Greenlight Planet Solar Home Lighting System (Sunking HLS) – 140.54 Lumen Manufacturer's

specification is 400 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)

7. Barefoot Go 250 – 140.54 Lumen (Manufacturer's specification is 135 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)
8. Spark Pro Ujala – 140.54 Lumen (Manufacturer's specification is 1320 Lumen which is more than threshold value of 140.54, hence 140.538 lumen value is considered)
9. Spark Pro Breeze – 140.54 Lumen (Manufacturer's specification is 990 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)
10. Magic TV P80 – 140.54 Lumen (Manufacturer's specification is 990 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)
11. SK1510 – 140.54 Lumen (Manufacturer's specification is 2000 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)
12. SK1520 – 140.54 Lumen (Manufacturer's specification is 4000 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)
13. SK1530 – 140.54 Lumen (Manufacturer's specification is 6000 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)
14. Spark Pro Phantom – 140.54 Lumen (Manufacturer's specification is 1320 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)
15. Spark Pro Plus – 140.54 Lumen (Manufacturer's specification is 1008 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)

Magic TV – 140.54 Lumen (Manufacturer’s specification is 672 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)

16.Phoenix 120 – 140.54 Lumen (Manufacturer’s specification is 672 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)

17.PICO – 140.54 Lumen (Manufacturer’s specification is 200 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)

18.Power 80 – 140.54 Lumen (Manufacturer’s specification is 1008 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)

19.SP 315 – 140.54 Lumen (Manufacturer’s specification is 5400 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)

20.SP Breeze – 140.54 Lumen (Manufacturer’s specification is 1008 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)

21.SP Breeze 2.0 – 140.54 Lumen (Manufacturer’s specification is 1008 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)

22.SP Inverter – 140.54 Lumen (Manufacturer’s specification is 2700 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)

23.SP 100 – 140.54 Lumen (Manufacturer’s specification is 1800 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)

24.SP 50 – 140.54 Lumen (Manufacturer’s specification is 1008 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)

25. Spark GO – 140.54 Lumen (Manufacturer's specification is 1008 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)
26. Spark Pro – 140.54 Lumen (Manufacturer's specification is 1800 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)
27. SK150 – 140.54 Lumen (Manufacturer's specification is 1125 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)
28. Turbo – 140.54 Lumen (Manufacturer's specification is 1008 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)
29. Turbo 120 – 140.54 Lumen (Manufacturer's specification is 1008 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)
30. Turbo 240 – 140.54 Lumen (Manufacturer's specification is 1008 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)
31. Turbo 80 – 140.54 Lumen (Manufacturer's specification is 672 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)
32. Power 55 – 140.54 Lumen (Manufacturer's specification is 750 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)
33. PowerMax – 140.54 Lumen (Manufacturer's specification is 400 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)
34. Power Plus – 140.54 Lumen (Manufacturer's specification is 1080 Lumen which is more than

threshold value of 140.54, hence 140.54 lumen value is considered)

35.Power Lite – 140.54 Lumen (Manufacturer's specification is 1008 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)

36.SP200 – 140.54 Lumen (Manufacturer's specification is 3600 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)

37.Turbo Classic – 140.54 Lumen (Manufacturer's specification is 1008 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)

38.Spark Series – 140.54 Lumen (Manufacturer's specification is 1125 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)

39.Star 200 4L+F – 140.54 Lumen (Manufacturer's specification is 720 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)

40.SP Inverter 200 – 140.54 Lumen (Manufacturer's specification is 2700 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)

41.SP_Inverter_100_12M – 140.54 Lumen (Manufacturer's specification is 1800 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)

42.SP Inverter 100 – 140.54 Lumen (Manufacturer's specification is 1800 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)

43.Ujala 2.0 – 140.54 Lumen (Manufacturer's specification is 1980 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)

	44.Ujal Breeze -140.54 Lumen (Manufacturer's specification is 1400 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered) 45.Sunverter 1530 -140.54 Lumen (Manufacturer's specification is 4200 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered) 46.d.light S500 - 140.54 Lumen(Manufacturer's specification is 240 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered) 47.d.light S450 - 140.54 Lumen(Manufacturer's specification is 170 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered) 48.d.light ST100 - 140.54 Lumen(Manufacturer's specification is 220 Lumen which is more than threshold value of 140.54, hence 140.54 lumen value is considered)
Measurement methods and procedures	Will be recorded at time of sale/installation in MEC Credit Tracker system
Monitoring frequency	Annual
QA/QC procedures	Each light installation has been geocoded (GPS coordinate or other specific location data) or provided with address/location of household in the MEC Tracker System. Associated data resides in the MEC Tracker Database, allowing each installation to be monitored on a regular basis.
Purpose of data	To calculate baseline emissions
Additional comment	The lumen value for this model is recorded once and used for emission reduction calculations. The lumen value for the lamp setting with least luminosity is used for conservativeness. In line with the information given in the eligibility criteria section and table 5 in section B.4 of this VPA DD, the lumen value for solar lighting systems in this VPA has been capped at 140.54 Lumen for individual households (based on Table 5 for the year 2021). If the Lumen value of solar lighting systems in an individual household is greater than 140.54 Lumen, value

of 140.54 Lumen is used to calculate emission reductions. If the Lumen value of solar lighting systems in an individual household is less than 140.54 Lumen, actual (lesser) lumen value is used to calculate emission reductions.

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

Data / Parameter	N _{i,a}	
Unit	Lamps	
Description	Total number of solar lamps of type i that have been deployed in period a	
Source of data	Primary data collected by PO/VPA implementer and recorded in Credit Tracker	
Value(s) applied	Model	Total Sales, Numbers
	<i>Sarala</i>	
	Barefoot Go250 (BH)	77
	Barefoot Go250 (WB)	697
	dlight S100 (AS)	113
	dlight S100 (BH)	1,481
	dlight S100 (WB)	7,155
	dlight S20 (WB)	11,923
	dlight S320 (BH)	2,795
	dlight S320 (WB)	34,985
	dlight M350+ (WB)	1,797
	Sunking pro2 (AS)	1,930
	Sunking pro2 (BH)	529
	Sunking pro2 (WB)	15,255
	Sunking HLS (BH)	811
	Sunking HLS (AS)	781

Simpa	
Magic TV (UP)	93
Magic TV (BH)	13
Magic TV P80 (BH)	4
Magic TV P80 (OD)	1
PHOENIX 120 (UP)	2
Pico (UP)	31
Power 80 (UP)	243
Power 80 (OD)	99
Power 80 (BH)	164
Power Lite (BH)	345
Power_55 (UP)	4
Power_55 (OD)	65
Power_55 (BH)	4
Power_Max (UP)	11
Power_Plus (BH)	1
SK-150 (UP)	325
SK-150 (BH)	68
SK-1510 (UP)	11
SK-1510 (BH)	2
SK-1520 (UP)	93
SK-1520 (BH)	10
SK-1520 (OD)	9
SK-1530 (BH)	26
SK-1530 (OD)	256
SK-1530 (UP)	21
SP 315 (UP)	23
SP 315 (OD)	189
SP 315 (BH)	26
SP Breeze (UP)	539
SP Breeze (OD)	104
SP Breeze 2.0 (UP)	127
SP Inverter (UP)	93
SP Inverter 100 (OD)	25

	SP Inverter 200 (OD)	62
	SP Inverter 200 (BH)	30
	SP_Inverter100_12M (OD)	2
	SP_Inverter100_12M (BH)	1
	SP100 (UP)	7,259
	SP100 (OD)	41
	SP100 (BH)	75
	SP200 (UP)	1,434
	SP200 (OD)	61
	SP200 (BH)	31
	SP50 (UP)	953
	SP50 (BH)	10
	Spark Go (UP)	98
	Spark Go (BH)	20
	Spark Pro (UP)	930
	Spark Pro (OD)	11
	Spark Pro (BH)	162
	Spark Pro Breeze (OD)	224
	Spark Pro Breeze (BH)	63
	Spark Pro Breeze (UP)	29
	Spark Pro Phantom (OD)	122
	Spark Pro Phantom (BH)	24
	Spark Pro Plus (OD)	645
	Spark Pro Plus (BH)	214
	Spark Pro Ujala (OD)	17
	Spark Series (UP)	1,876
	Star 200 4L+F (UP)	3
	Turbo (UP)	11

	Turbo 120 (UP)	1,655
	Turbo 240 (UP)	903
	Turbo 80 (UP)	264
	Turbo Classic (UP)	4
	Sunverter 1530 (OD)	54
	Sunverter 1530 (UP)	5
	Ujala 2.0 (BH)	15
	Ujala 2.0 (OD)	2
	Ujala Breeze (BH)	1
	Ujala Breeze (OD)	1
	GGI	
	Sunny Lantern	1,210
	Sunny Tubelight	3,746
	Arohan	
	d.light S450 (AS)	107
	d.light S500 (AS)	27,406
	ST100 (CG)	822
	ST100 (JK)	3,211
	ST100 (MP)	416
	ST100 (OD)	603
	ST100 (WB)	693
	d.light S100 (CG)	82
	d.light S100 (JK)	98
	d.light S100 (OD)	42
	d.light S100 (WB)	4,614
	Total	138,762
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	39 models of Simpa, 7 models of Sarala and 4 models of Arohan are distributed under this VPA
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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																																																																																																																												
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SP Inverter 200	Bihar	365	188
	Odisha	341	176
SP_Inverter100_12M	Bihar	365	188
	Odisha	365	188
SP100	Uttar Pradesh	358	184
	Bihar	336	173
	Odisha	347	179
SP200	Uttar Pradesh	358	184
	Bihar	341	176
	Odisha	336	176
SP50	Uttar Pradesh	357	184
	Bihar	365	188
Spark Go	Uttar Pradesh	346	178
	Bihar	365	188
Spark Pro	Uttar Pradesh	354	182
	Bihar	345	178
	Odisha	365	188
Spark Pro Breeze	Uttar Pradesh	365	188
	Bihar	348	179
	Odisha	355	183
Spark Pro Phantom	Bihar	365	188
	Odisha	350	180
Spark Pro Plus	Bihar	356	184
	Odisha	356	183
Spark Pro Ujala	Odisha	365	188
Spark Series	Uttar Pradesh	357	184
Star 200 4L+F	Uttar Pradesh	365	188
Turbo	Uttar Pradesh	365	188
Turbo 120	Uttar Pradesh	352	181
Turbo 240	Uttar Pradesh	352	182
Turbo 80	Uttar Pradesh	346	178
Ujala 2.0	Bihar	365	188
	Odisha	365	188
Ujala Breeze	Odisha	365	188
	Bihar	365	188
Sunverter 1530	Odisha	345	178
	Uttar Pradesh	365	188
Turbo Classic	Uttar Pradesh	365	188
Barefoot Go250	Bihar	341	176
	West Bengal	351	181
dlight S100	Assam	338	179
	Bihar	352	181
	West Bengal	351	181
dlight S20	West Bengal	347	179

	d.light S320	Bihar	354	183
		West Bengal	353	182
	d.light M350+	West Bengal	350	179
	Sunking pro2	Assam	350	180
		Bihar	348	179
		West Bengal	356	183
	Sunking HLS	Bihar	352	182
		Assam	355	183
	d.light S500	Assam	363	187
	d.light S450	Assam	348	179
	d.light ST100	Chhattisgarh	360	185
		Jharkhand	361	186
		Madhya Pradesh	356	183
		Odisha	361	186
		West Bengal	358	184
	d.light S100	Chhattisgarh	356	183
		Jharkhand	358	184
		Odisha	322	166
		West Bengal	362	186
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 – Simpa, Sarala and Arohan.			
Purpose of data	Calculation of baseline emissions			
Additional comment	Individual number of days solar lighting systems have operated during the monitoring period is calculated and the average value is used for calculating the emission reductions.			

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

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

Data / Parameter	LFR _{i,v}																																																																																		
Unit	%																																																																																		
Description	Lamp failure rate: Share of lamps of lamp type <i>i</i> in checked sample group gi,v not operational in period v																																																																																		
Source of data	Monitoring partner, Credit Tracker																																																																																		
Value(s) applied	<table><tr><th>Model</th><th>State</th><th>Year-1</th><th>Year-2</th></tr><tr><td rowspan="2">Magic TV</td><td>Uttar Pradesh</td><td>5.38%</td><td>6.45%</td></tr><tr><td>Bihar</td><td>0.00%</td><td>0.00%</td></tr><tr><td rowspan="2">Magic TV P80</td><td>Odisha</td><td>0.00%</td><td>0.00%</td></tr><tr><td>Bihar</td><td>0.00%</td><td>0.00%</td></tr><tr><td>PHOENIX 120</td><td>Uttar Pradesh</td><td>0.00%</td><td>0.00%</td></tr><tr><td>Pico</td><td>Uttar Pradesh</td><td>3.23%</td><td>3.23%</td></tr><tr><td rowspan="3">Power 80</td><td>Uttar Pradesh</td><td>4.12%</td><td>6.17%</td></tr><tr><td>Bihar</td><td>4.04%</td><td>5.05%</td></tr><tr><td>Odisha</td><td>3.05%</td><td>4.27%</td></tr><tr><td>Power Lite</td><td>Bihar</td><td>2.32%</td><td>2.61%</td></tr><tr><td rowspan="3">Power_55</td><td>Uttar Pradesh</td><td>0.00%</td><td>0.00%</td></tr><tr><td>Bihar</td><td>0.00%</td><td>0.00%</td></tr><tr><td>Odisha</td><td>4.62%</td><td>4.62%</td></tr><tr><td>Power_Max</td><td>Uttar Pradesh</td><td>0.00%</td><td>0.00%</td></tr><tr><td>Power_Plus</td><td>Bihar</td><td>0.00%</td><td>0.00%</td></tr><tr><td rowspan="2">SK-150</td><td>Uttar Pradesh</td><td>2.46%</td><td>2.77%</td></tr><tr><td>Bihar</td><td>5.88%</td><td>5.88%</td></tr><tr><td rowspan="2">SK-1510</td><td>Uttar Pradesh</td><td>0.00%</td><td>0.00%</td></tr><tr><td>Bihar</td><td>0.00%</td><td>0.00%</td></tr><tr><td rowspan="2">SK-1520</td><td>Odisha</td><td>0.00%</td><td>0.00%</td></tr><tr><td>Bihar</td><td>0.00%</td><td>0.00%</td></tr></table>				Model	State	Year-1	Year-2	Magic TV	Uttar Pradesh	5.38%	6.45%	Bihar	0.00%	0.00%	Magic TV P80	Odisha	0.00%	0.00%	Bihar	0.00%	0.00%	PHOENIX 120	Uttar Pradesh	0.00%	0.00%	Pico	Uttar Pradesh	3.23%	3.23%	Power 80	Uttar Pradesh	4.12%	6.17%	Bihar	4.04%	5.05%	Odisha	3.05%	4.27%	Power Lite	Bihar	2.32%	2.61%	Power_55	Uttar Pradesh	0.00%	0.00%	Bihar	0.00%	0.00%	Odisha	4.62%	4.62%	Power_Max	Uttar Pradesh	0.00%	0.00%	Power_Plus	Bihar	0.00%	0.00%	SK-150	Uttar Pradesh	2.46%	2.77%	Bihar	5.88%	5.88%	SK-1510	Uttar Pradesh	0.00%	0.00%	Bihar	0.00%	0.00%	SK-1520	Odisha	0.00%	0.00%	Bihar	0.00%	0.00%
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	Uttar Pradesh	6.45%	6.45%
SK-1530	Uttar Pradesh	0.00%	0.00%
	Odisha	1.95%	1.95%
	Bihar	0.00%	0.00%
SP 315	Uttar Pradesh	0.00%	0.00%
	Bihar	0.00%	0.00%
	Odisha	2.65%	3.17%
SP Breeze	Odisha	1.92%	2.88%
	Uttar Pradesh	2.04%	3.34%
SP Breeze 2.0	Uttar Pradesh	3.94%	3.94%
SP Inverter	Uttar Pradesh	3.23%	4.30%
SP Inverter 100	Odisha	0.00%	0.00%
SP Inverter 200	Bihar	0.00%	0.00%
	Odisha	6.45%	6.45%
SP_Inverter100_12M	Bihar	0.00%	0.00%
	Odisha	0.00%	0.00%
SP100	Uttar Pradesh	2.00%	2.05%
	Bihar	6.67%	8.00%
	Odisha	2.44%	4.88%
SP200	Uttar Pradesh	1.81%	2.02%
	Bihar	6.45%	6.45%
	Odisha	3.28%	6.56%
SP50	Uttar Pradesh	2.10%	2.31%
	Bihar	0.00%	0.00%
Spark Go	Uttar Pradesh	3.06%	5.10%
	Bihar	0.00%	0.00%
Spark Pro	Uttar Pradesh	2.58%	3.12%
	Bihar	3.70%	5.56%
	Odisha	0.00%	0.00%
Spark Pro Breeze	Uttar Pradesh	0.00%	0.00%
	Bihar	4.76%	4.76%
	Odisha	2.23%	2.68%
Spark Pro Phantom	Bihar	0.00%	0.00%
	Odisha	2.46%	4.10%
Spark Pro Plus	Bihar	1.87%	2.34%
	Odisha	1.55%	2.48%
Spark Pro Ujala	Odisha	0.00%	0.00%
Spark Series	Uttar Pradesh	1.81%	2.19%
Star 200 4L+F	Uttar Pradesh	0.00%	0.00%
Turbo	Uttar Pradesh	0.00%	0.00%
Turbo 120	Uttar Pradesh	3.08%	3.56%
Turbo 240	Uttar Pradesh	3.21%	3.43%
Turbo 80	Uttar Pradesh	3.79%	5.30%
Ujala 2.0	Bihar	0.00%	0.00%

		Odisha	0.00%	0.00%
	Ujala Breeze	Odisha	0.00%	0.00%
		Bihar	0.00%	0.00%
	Sunverter 1530	Odisha	5.56%	5.56%
		Uttar Pradesh	0.00%	0.00%
	Turbo Classic	Uttar Pradesh	0.00%	0.00%
	Barefoot Go250	Bihar	5.19%	6.49%
		West Bengal	3.73%	3.87%
	dlight S100	Assam	5.31%	7.08%
		Bihar	2.97%	3.58%
		West Bengal	3.55%	3.76%
	dlight S20	West Bengal	4.62%	4.96%
	dlight S320	Bihar	2.40%	2.90%
		West Bengal	3.27%	3.36%
	dlight M350+	West Bengal	3.12%	4.95%
	Sunking pro2	Assam	3.68%	4.09%
		Bihar	4.35%	4.73%
		West Bengal	2.18%	2.58%
	Sunking HLS	Bihar	2.34%	3.45%
		Assam	1.92%	2.82%
	d.light S500	Assam	0.40%	0.45%
	d.light S450	Assam	3.74%	4.67%
	d.light ST100	Chhattisgarh	0.73%	1.46%
		Jharkhand	0.93%	1.00%
		Madhya Pradesh	2.16%	2.40%
		Odisha	0.66%	1.00%
		West Bengal	1.44%	1.88%
	d.light S100	Chhattisgarh	2.44%	2.44%
		Jharkhand	1.02%	2.04%
		Odisha	9.52%	11.90%
		West Bengal	0.85%	0.89%
Measurement methods and procedures				
CME/PO have tracked the usage status of all solar lighting systems from each quarter of the year with results recorded in Credit Tracker.				
At the end of each quarter of the calendar year, PO tracks and reports back to CME on whether the household is using their solar device and also whether they have purchased any other solar lighting product. This quarterly monitoring is conducted in March, June, September, and December months of every year. In cases where the end of the monitoring period does not coincide with the end month of a calendar year quarter, field staff from POs also				

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

Data / Parameter	$CF_{i,v,LFR}$											
Unit	%											
Description	This factor corrects the total number of lamps of type i by the share of these lamps that were found to be operational according to the sampling in period v. The statistical error is included in the parameter (confidence level 90%) when 90/10 precision is not met. Otherwise, the mean value of LFR will be used.											
Source of data	LFR _{i,v}											
Value(s) applied	<table><tr><th>Model</th><th>State</th><th>Year-1</th><th>Year-2</th></tr><tr><td>Magic TV</td><td>Uttar Pradesh</td><td>89.40 %</td><td>87.86%</td></tr></table>	Model	State	Year-1	Year-2	Magic TV	Uttar Pradesh	89.40 %	87.86%			
Model	State	Year-1	Year-2									
Magic TV	Uttar Pradesh	89.40 %	87.86%									

		Bihar	100.00 %	100.00 %
	Magic TV P80	Odisha	100.00 %	100.00 %
		Bihar	100.00 %	100.00 %
	PHOENIX 120	Uttar Pradesh	100.00 %	100.00 %
	Pico	Uttar Pradesh	92.61 %	92.61%
	Power 80	Uttar Pradesh	92.63 %	89.79%
		Bihar	91.40 %	89.96%
		Odisha	92.90 %	91.19%
	Power Lite	Bihar	94.35 %	94.10%
	Power_5 5	Uttar Pradesh	100.00 %	100.00 %
		Bihar	100.00 %	100.00 %
		Odisha	90.36 %	90.44%
	Power_Max	Uttar Pradesh	100.00 %	100.00 %
	Power_Plus	Bihar	100.00 %	100.00 %
	SK-150	Uttar Pradesh	94.16 %	93.60%
		Bihar	88.48 %	88.58%
	SK-1510	Uttar Pradesh	100.00 %	100.00 %
		Bihar	100.00 %	100.00 %
	SK-1520	Odisha	100.00 %	100.00 %
		Bihar	100.00 %	100.00 %
		Uttar Pradesh	87.86 %	87.95%
	SK-1530	Uttar Pradesh	100.00 %	100.00 %
		Odisha	94.84 %	94.84%
		Bihar	100.00 %	100.00 %
	SP 315	Uttar Pradesh	100.00 %	100.00 %
		Bihar	100.00 %	100.00 %

		Odisha	93.64 %	93.06%
	SP Breeze	Odisha	94.79 %	93.11%
		Uttar Pradesh	95.50 %	93.48%
	SP Breeze 2.0	Uttar Pradesh	91.32 %	91.40%
	SP Inverter	Uttar Pradesh	92.54 %	90.92%
	SP Inverter 100	Odisha	100.00 %	100.00 %
	SP Inverter 200	Bihar	100.00 %	100.00 %
		Odisha	87.66 %	87.76%
	SP_Inverter100_1 2M	Bihar	100.00 %	100.00 %
		Odisha	100.00 %	100.00 %
	SP100	Uttar Pradesh	96.00 %	95.86%
		Bihar	87.36 %	85.61%
		Odisha	93.93 %	90.05%
	SP200	Uttar Pradesh	96.25 %	95.85%
		Bihar	87.66 %	87.76%
		Odisha	92.46 %	87.41%
	SP50	Uttar Pradesh	95.49 %	95.15%
		Bihar	100.00 %	100.00 %
	Spark Go	Uttar Pradesh	93.01 %	89.72%
		Bihar	100.00 %	100.00 %
	Spark Pro	Uttar Pradesh	95.10 %	94.26%
		Bihar	91.69 %	88.86%
		Odisha	100.00 %	100.00 %
	Spark Pro Breeze	Uttar Pradesh	100.00 %	100.00 %
		Bihar	90.22 %	90.22%

	Odisha	94.17 %	93.45%
Spark Pro Phantom	Bihar	100.00 %	100.00 %
	Odisha	93.83 %	91.15%
Spark Pro Plus	Bihar	94.89 %	94.04%
	Odisha	96.20 %	94.81%
Spark Pro Ujala	Odisha	100.00 %	100.00 %
Spark Series	Uttar Pradesh	96.25 %	95.64%
Star 200 4L+F	Uttar Pradesh	100.00 %	100.00 %
Turbo	Uttar Pradesh	100.00 %	100.00 %
Turbo 120	Uttar Pradesh	94.44 %	93.65%
Turbo 240	Uttar Pradesh	93.80 %	93.43%
Turbo 80	Uttar Pradesh	92.16 %	89.94%
Ujala 2.0	Bihar	100.00 %	100.00 %
	Odisha	100.00 %	100.00 %
Ujala Breeze	Odisha	100.00 %	100.00 %
	Bihar	100.00 %	100.00 %
Sunverte r 1530	Odisha	89.05 %	89.05%
	Uttar Pradesh	100.00 %	100.00 %
Turbo Classic	Uttar Pradesh	100.00 %	100.00 %
Barefoot Go250	Bihar	89.49 %	87.60%
	West Bengal	93.45 %	93.21%
dlight S100	Assam	89.22 %	87.07%
	Bihar	94.55 %	93.64%
	West Bengal	93.89 %	93.71%
dlight S20	West Bengal	92.35 %	92.19%
dlight S320	Bihar	95.38 %	94.59%

		West Bengal	94.17 %	94.31%
	d.light M350+	West Bengal	94.41 %	92.18%
	Sunking pro2	Assam	93.55 %	92.97%
		Bihar	91.54 %	90.95%
		West Bengal	95.68 %	95.31%
	Sunking HLS	Bihar	95.12 %	93.43%
		Assam	95.52 %	94.31%
	d.light S500	Assam	98.28 %	98.24%
	d.light S450	Assam	91.72 %	90.18%
	d.light ST100	Chhattisgarh	97.49 %	96.18%
		Jharkhand	97.05 %	97.07%
		Madhya Pradesh	94.91 %	94.51%
		Odisha	97.39 %	96.63%
		West Bengal	96.18 %	95.46%
	d.light S100	Chhattisgarh	93.93 %	93.93%
		Jharkhand	96.61 %	94.57%
		Odisha	83.44 %	80.20%
		West Bengal	97.41 %	97.31%
Measurement methods and procedures	The value is calculated using the recorded value for $LFR_{i,v}$ – $CF_{i,v,LFR} = 1 - (LFR_{i,v} + z * \sqrt{LFR_{i,v} * (1 - LFR_{i,v})})$			
	$ni,v,total$			
Monitoring frequency	Annual			
QA/QC procedures	The statistical error is included in this parameter (confidence level 90%) when 90/10 precision is not met. But in this monitoring period, 90/10 precision is met.			
Purpose of data	Calculation of baseline emissions			
Additional comment	-			

Data / Parameter	n _{r,i,v,total}																																																																																																																																			
Unit	Lamps																																																																																																																																			
Description	Total number of lamps checked for which a valid result was obtained.																																																																																																																																			
Source of data	Monitoring partner, Credit Tracker																																																																																																																																			
Value(s) applied	<table><tr><th>Model</th><th>State</th><th>Year-1</th><th>Year-2</th></tr><tr><td rowspan="2">Magic TV</td><td>Uttar Pradesh</td><td>31</td><td>31</td></tr><tr><td>Bihar</td><td>13</td><td>13</td></tr><tr><td rowspan="2">Magic TV P80</td><td>Odisha</td><td>1</td><td>1</td></tr><tr><td>Bihar</td><td>4</td><td>4</td></tr><tr><td>PHOENIX 120</td><td>Uttar Pradesh</td><td>2</td><td>2</td></tr><tr><td>Pico</td><td>Uttar Pradesh</td><td>30</td><td>30</td></tr><tr><td rowspan="3">Power 80</td><td>Uttar Pradesh</td><td>62</td><td>59</td></tr><tr><td>Bihar</td><td>31</td><td>32</td></tr><tr><td>Odisha</td><td>30</td><td>33</td></tr><tr><td>Power Lite</td><td>Bihar</td><td>34</td><td>39</td></tr><tr><td rowspan="3">Power_55</td><td>Uttar Pradesh</td><td>4</td><td>4</td></tr><tr><td>Bihar</td><td>4</td><td>4</td></tr><tr><td>Odisha</td><td>29</td><td>30</td></tr><tr><td>Power_Max</td><td>Uttar Pradesh</td><td>11</td><td>11</td></tr><tr><td>Power_Plus</td><td>Bihar</td><td>1</td><td>1</td></tr><tr><td rowspan="2">SK-150</td><td>Uttar Pradesh</td><td>35</td><td>34</td></tr><tr><td>Bihar</td><td>29</td><td>30</td></tr><tr><td rowspan="2">SK-1510</td><td>Uttar Pradesh</td><td>2</td><td>2</td></tr><tr><td>Bihar</td><td>11</td><td>11</td></tr><tr><td rowspan="3">SK-1520</td><td>Odisha</td><td>9</td><td>9</td></tr><tr><td>Bihar</td><td>10</td><td>10</td></tr><tr><td>Uttar Pradesh</td><td>31</td><td>32</td></tr><tr><td rowspan="3">SK-1530</td><td>Uttar Pradesh</td><td>21</td><td>21</td></tr><tr><td>Odisha</td><td>31</td><td>31</td></tr><tr><td>Bihar</td><td>26</td><td>26</td></tr><tr><td rowspan="3">SP 315</td><td>Uttar Pradesh</td><td>22</td><td>23</td></tr><tr><td>Bihar</td><td>26</td><td>26</td></tr><tr><td>Odisha</td><td>31</td><td>36</td></tr><tr><td rowspan="2">SP Breeze</td><td>Odisha</td><td>29</td><td>29</td></tr><tr><td>Uttar Pradesh</td><td>55</td><td>53</td></tr><tr><td>SP Breeze 2.0</td><td>Uttar Pradesh</td><td>28</td><td>29</td></tr><tr><td>SP Inverter</td><td>Uttar Pradesh</td><td>29</td><td>30</td></tr><tr><td>SP Inverter 100</td><td>Odisha</td><td>25</td><td>25</td></tr><tr><td rowspan="2">SP Inverter 200</td><td>Bihar</td><td>30</td><td>30</td></tr><tr><td>Odisha</td><td>29</td><td>30</td></tr></table>				Model	State	Year-1	Year-2	Magic TV	Uttar Pradesh	31	31	Bihar	13	13	Magic TV P80	Odisha	1	1	Bihar	4	4	PHOENIX 120	Uttar Pradesh	2	2	Pico	Uttar Pradesh	30	30	Power 80	Uttar Pradesh	62	59	Bihar	31	32	Odisha	30	33	Power Lite	Bihar	34	39	Power_55	Uttar Pradesh	4	4	Bihar	4	4	Odisha	29	30	Power_Max	Uttar Pradesh	11	11	Power_Plus	Bihar	1	1	SK-150	Uttar Pradesh	35	34	Bihar	29	30	SK-1510	Uttar Pradesh	2	2	Bihar	11	11	SK-1520	Odisha	9	9	Bihar	10	10	Uttar Pradesh	31	32	SK-1530	Uttar Pradesh	21	21	Odisha	31	31	Bihar	26	26	SP 315	Uttar Pradesh	22	23	Bihar	26	26	Odisha	31	36	SP Breeze	Odisha	29	29	Uttar Pradesh	55	53	SP Breeze 2.0	Uttar Pradesh	28	29	SP Inverter	Uttar Pradesh	29	30	SP Inverter 100	Odisha	25	25	SP Inverter 200	Bihar	30	30	Odisha	29	30
Model	State	Year-1	Year-2																																																																																																																																	
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SP Inverter 200	Bihar	30	30																																																																																																																																	
	Odisha	29	30																																																																																																																																	

SP_Inverter100_12M	Bihar	1	1
	Odisha	2	2
SP100	Uttar Pradesh	81	77
	Bihar	29	30
	Odisha	30	30
SP200	Uttar Pradesh	79	73
	Bihar	29	30
	Odisha	29	28
SP50	Uttar Pradesh	59	58
	Bihar	10	10
Spark Go	Uttar Pradesh	32	30
	Bihar	20	20
Spark Pro	Uttar Pradesh	78	73
	Bihar	28	28
	Odisha	11	11
Spark Pro Breeze	Uttar Pradesh	29	29
	Bihar	30	30
	Odisha	28	29
Spark Pro Phantom	Bihar	24	24
	Odisha	29	29
Spark Pro Plus	Bihar	29	29
	Odisha	50	55
Spark Pro Ujala	Odisha	17	17
Spark Series	Uttar Pradesh	79	75
Star 200 4L+F	Uttar Pradesh	3	3
Turbo	Uttar Pradesh	11	11
Turbo 120	Uttar Pradesh	81	74
Turbo 240	Uttar Pradesh	58	56
Turbo 80	Uttar Pradesh	37	37
Ujala 2.0	Bihar	15	15
	Odisha	2	2
Ujala Breeze	Odisha	1	1
	Bihar	1	1
Sunverter 1530	Odisha	30	30
	Uttar Pradesh	5	5
Turbo Classic	Uttar Pradesh	4	4
Barefoot Go250	Bihar	29	29
	West Bengal	75	73
dlight S100	Assam	28	32
	Bihar	78	74
	West Bengal	87	94
dlight S20	West Bengal	80	96
dlight S320	Bihar	79	74
	West Bengal	80	99

	d.light M350+	West Bengal	82	95
	Sunking pro2	Assam	77	76
		Bihar	41	40
		West Bengal	78	94
	Sunking HLS	Bihar	59	57
		Assam	48	55
	d.light S500	Assam	38	44
	d.light S450	Assam	29	28
	d.light ST100	Chhattisgarh	38	43
		Jharkhand	38	44
		Madhya Pradesh	41	41
		Odisha	29	29
		West Bengal	42	43
	d.light S100	Chhattisgarh	30	30
		Jharkhand	30	29
		Odisha	29	28
		West Bengal	46	45
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>i</i> in the monitoring period, <i>p</i> . 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.

VPA17 – GS11451 and VPA18 – GS11486

Data / Parameter	In
Unit	Lumens
Description	Lumen output of each solar lamp <i>n</i> deployed as part of project activity
Source of data	Table 4, 2021 value
Value(s) applied	N.A. as there are no solar lighting systems distributed under VPAs till the end of this monitoring period.
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 will be geocoded (GPS coordinate

	or other specific location data) or provided with address/location of household in the MEC Tracker System. Associated data will reside in the MEC Tracker Database, allowing each installation to be monitored on a regular basis.
Purpose of data	To calculate baseline emissions
Additional comment	N.A. as there are no solar lighting systems distributed under this VPA till the end of this monitoring period.

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	N.A
Measurement methods and procedures	N.A.
Monitoring frequency	Annual
QA/QC procedures	Each light installation will be 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	No solar lighting systems distributed in this VPA for the considered 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	N.A. as there are no solar lighting systems distributed under VPAs till the end of this monitoring period.

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 installation date in MEC tracker system can be crosschecked with the MIS system of the PO's
Purpose of data	Calculation of baseline emissions
Additional comment	N.A. as there are no solar lighting systems distributed under this VPA till the end of this monitoring period

Data / Parameter	H
Unit	Hours/day
Description	Average operating hours of kerosene lamps in the baseline
Source of data	Methodology default
Value(s) applied	N.A. as there are no solar lighting systems distributed under VPAs till the end of this monitoring period.
Measurement methods and procedures	N.A as default value is used.
Monitoring frequency	Annual
QA/QC procedures	N.A. as there are no solar lighting systems distributed under VPAs till the end of this monitoring period
Purpose of data	Calculation of baseline emissions
Additional comment	N.A. as there are no solar lighting systems distributed under this VPA till the end of this monitoring period

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	N.A. as there are no solar lighting systems distributed under VPAs till the end of this monitoring period
Measurement methods and procedures	
Monitoring frequency	Annual
QA/QC procedures	N.A.
Purpose of data	Calculation of baseline emissions
Additional comment	N.A. as there are no solar lighting systems distributed under VPAs till the end of this monitoring period.

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	N.A. as there are no solar lighting systems distributed under VPAs till the end of this monitoring period
Measurement methods and procedures	The value is calculated using the recorded value for $LFR_{i,v}$ – $CF_{i,v,LFR} = 1 - (LFR_{i,v} + z * \sqrt{LFR_{i,v} * (1 - LFR_{i,v})})_{ni,v,total}$
Monitoring frequency	Annual
QA/QC procedures	The statistical error is included in this parameter (confidence level 90%) when 90/10 precision is not met.
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	N.A. as there are no solar lighting systems distributed under VPAs till the end of this monitoring period
Measurement methods and procedures	CME/PO/Monitoring partner will randomly and representatively track households contacted and reached for monitoring lamp usage status for each lamp type i in the monitoring period, p. This data will be recorded in Credit Tracker. Survey methods will be used.
Monitoring frequency	Annual
QA/QC procedures	N.A. as there are no solar lighting systems distributed under VPAs till the end of this monitoring period
Purpose of data	Calculation of baseline emissions
Additional comment	N.A. as there are no solar lighting systems distributed under VPAs till the end of this monitoring period

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	N.A. as there are no solar lighting systems distributed under VPAs till the end of this monitoring period
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	N.A. as there are no solar lighting systems distributed under VPAs till the end of this monitoring period
Purpose of data	Calculation of baseline emissions

Additional comment

N.A. as there are no solar lighting systems distributed under VPAs till the end of this monitoring period

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

VPAs with monitoring period 01/01/2021 to 31/12/2021

Data/Parameter	Value obtained in this monitoring period			Value obtained last monitoring period		
N _{p,y}	VPA4	Smart KA	29,937	VPA4	Smart KA	29,937
	VPA7	Smart KA	23,337	VPA7	Smart KA	23,337
		Smart CG	2,492		Smart CG	2,492
		Smart MP	1,689		Smart MP	1,689
		Smart TN	977		Smart TN	977
	VPA8	Smart KA	23,337	VPA8	Smart KA	23,337
	VPA17	Smart KA	26,921	VPA17	Smart KA	26,921
VPA18	Jumbo KA	26,000	VPA18	Jumbo KA	26,000	
	Smart KA	80		Smart KA	80	
U _{p,y}	VPA4	Smart KA	57%	VPA4	Smart KA	69%
	VPA7	Smart KA	61%	VPA7	Smart KA	70%
		Smart CG	51%		Smart CG	61%
		Smart MP	58%		Smart MP	66%
		Smart TN	65%		Smart TN	67%
	VPA8	Smart KA	61%	VPA8	Smart KA	69%
	VPA17	Smart KA	86%	VPA17	Smart KA	89%
VPA18	Jumbo KA	83%	VPA18	Jumbo KA	89%	
	Smart KA	85%		Smart KA	87%	
P _{p,y}	VPA4	Smart KA	0.0036	-		
	VPA7	Smart KA	0.0034			
		Smart CG	0.0034			
		Smart MP	0.0033			
		Smart TN	0.0032			
	VPA8	Smart KA	0.0035			
	VPA17	Smart KA	0.0032			
VPA18	Jumbo KA	0.0030				
	Smart KA	0.0029				
N _{i,a} /N _{i,j}	VPA4	56,342 solar lamps		VPA4	19,794 solar lighting system	
	VPA7	126,504 solar lamps				

	<table><tr><td>VPA8</td><td>35,349 solar lamps</td></tr><tr><td>VPA17</td><td>0</td></tr><tr><td>VPA18</td><td>0</td></tr></table>	VPA8	35,349 solar lamps	VPA17	0	VPA18	0	<table><tr><td>VPA7</td><td>46,822 solar lighting system</td></tr><tr><td>VPA8</td><td>11,671 solar lighting system</td></tr><tr><td>VPA17</td><td>0</td></tr><tr><td>VPA18</td><td>0</td></tr></table>	VPA7	46,822 solar lighting system	VPA8	11,671 solar lighting system	VPA17	0	VPA18	0						
VPA8	35,349 solar lamps																					
VPA17	0																					
VPA18	0																					
VPA7	46,822 solar lighting system																					
VPA8	11,671 solar lighting system																					
VPA17	0																					
VPA18	0																					
LFR _{i,v}	Refer to Section D.2	Refer to MR in CDM																				
CF _{i,v,LFR}	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																				
OF _{y,i,j}	Refer to Section D.2	-																				
SDG 13	<table><tr><td>VPA4</td><td>44,620</td></tr><tr><td>VPA7</td><td>52,851</td></tr><tr><td>VPA8</td><td>41,172</td></tr><tr><td>VPA17</td><td>68,813</td></tr><tr><td>VPA18</td><td>66,392</td></tr></table>	VPA4	44,620	VPA7	52,851	VPA8	41,172	VPA17	68,813	VPA18	66,392	<table><tr><td>VPA4</td><td>13,484</td></tr><tr><td>VPA7</td><td>16,360</td></tr><tr><td>VPA8</td><td>11,066</td></tr><tr><td>VPA17</td><td>17,199</td></tr><tr><td>VPA18</td><td>16,704</td></tr></table>	VPA4	13,484	VPA7	16,360	VPA8	11,066	VPA17	17,199	VPA18	16,704
	VPA4	44,620																				
	VPA7	52,851																				
	VPA8	41,172																				
	VPA17	68,813																				
VPA18	66,392																					
VPA4	13,484																					
VPA7	16,360																					
VPA8	11,066																					
VPA17	17,199																					
VPA18	16,704																					
SDG 1	ICS																					
	VPA4- 29,937																					
	VPA7- 28,495																					
	VPA8- 23,337																					
	VPA17-26,921																					
	VPA18-26,080																					
	SLS																					
	VPA4- 19,794																					
	VPA7- 46,822																					
	VPA8- 11,671																					
VPA17-0																						
VPA18-0																						
SDG 3	ICS																					
	VPA4- 64%																					
	VPA7- 66%																					
	VPA8- 68%																					
	VPA17-86%																					
VPA18-83%																						
SDG 5	ICS																					
	VPA4- 64%																					
	VPA7- 66%																					

	VPA8- 68%	
	VPA17-86%	
	VPA18-83%	
	ICS	
	VPA 4-17,127	
	VPA 7-17,036	
	VPA 8-14,228	
	VPA 17-23,152	
	VPA 18-21,648	
SDG 7	SLS	-
	VPA4- 14,375	
	VPA7- 35,522	
	VPA8- 9,421	
	VPA17-0	
	VPA18-0	
	VPA4- 30	
	VPA7- 60	
SDG 8	VPA8- 30	-
	VPA17-30	
	VPA18-30	

VPA's with monitoring period 27/06/2020 to 31/12/2021

Data/Parameter	Value obtained in this monitoring period				Value obtained last monitoring period			
N _{p,y}	VPA5	Smart KA	19,963		VPA5	Smart KA	19,963	
	VPA11	Smart KA	34		VPA11	Smart KA	34	
		Jumbo KA	555			Jumbo KA	555	
		Smart MH	7,353			Smart MH	7,353	
		Jumbo KL	4,950			Jumbo KL	4,950	
		PowerGram TN	1,328			Powergram TN	1,328	
VPA13	Smart KA	15,000		VPA13	Smart KA	15,000		
		Jumbo KA	12,000			Jumbo KA	12,000	
U _{p,y}			Year1	Year2	VPA5	Smart KA	72%	
	VPA5	Smart KA	58%	56%	VPA11	Smart KA	82%	
	VPA11	Smart KA	74%	68%		Jumbo KA	69%	
		Jumbo KA	55%	53%		Smart MH	70%	
		Smart MH	66%	61%		Jumbo KL	70%	
		Jumbo KL	66%	62%		PowerGram TN	71%	
		PowerGram TN	66%	60%	VPA13	Smart KA	81%	
	VPA13	Smart KA	76%	70%		Jumbo KA	83%	
			Jumbo KA	76%	71%			
	P _{p,y}	VPA5	Smart KA	0.0036	-7			
VPA11		Smart KA	0.0034					
		Jumbo KA	0.0034					
		Smart MH	0.0033					
		Jumbo KL	0.0032					
		PowerGram TN	0.0035					
VPA13	Smart KA	0.0031						
		Jumbo KA	0.0026					
N _{i,a} /N _{i,j}	VPA5	86,220 solar lamps		VPA5	81,045 solar lighting system			

⁷ This is due to change in methodology from AMS II.G to TPDDTEC

	<table><tr><td>VPA11</td><td>242,588 solar lamps</td></tr><tr><td>VPA13</td><td>138,762 solar lighting systems</td></tr></table>	VPA11	242,588 solar lamps	VPA13	138,762 solar lighting systems		<table><tr><td>VPA7</td><td>242,588 solar lighting system</td></tr><tr><td>VPA13</td><td>143,718 solar lighting systems</td></tr></table>	VPA7	242,588 solar lighting system	VPA13	143,718 solar lighting systems				
VPA11	242,588 solar lamps														
VPA13	138,762 solar lighting systems														
VPA7	242,588 solar lighting system														
VPA13	143,718 solar lighting systems														
LFR _{i,v}	Refer to Section D.2		Refer to MR in CDM												
CF _{i,v,LFR}	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												
OF _{y,i,j}	Refer to Section D.2		-												
SDG 13	<table><tr><td>VPA5</td><td>68,446</td></tr><tr><td>VPA11</td><td>59,473</td></tr><tr><td>VPA13</td><td>152,786</td></tr></table>	VPA5	68,446	VPA11	59,473	VPA13	152,786		<table><tr><td>VPA5</td><td>17,818</td></tr><tr><td>VPA11</td><td>27,833</td></tr><tr><td>VPA13</td><td>32,077</td></tr></table>	VPA5	17,818	VPA11	27,833	VPA13	32,077
	VPA5	68,446													
	VPA11	59,473													
VPA13	152,786														
VPA5	17,818														
VPA11	27,833														
VPA13	32,077														
SDG 1	ICS		-												
	VPA5- 19,963														
	VPA11- 19,734														
	VPA13- 27,000														
	SLS														
	VPA5- 81,045														
SDG 3	VPA11- 242,588		-												
	VPA13- 138,762														
	ICS														
	VPA5- 62%														
SDG 5	VPA11- 64%		-												
	VPA13- 73%														
	ICS														
SDG 7	VPA5- 62%		-												
	VPA11- 64%														
	VPA13-73%														
	ICS														
SDG 8	VPA5- 11,013		-												
	VPA11- 9,005														
	VPA13-19,809														
	SLS														
	VPA5- 66,137														
	VPA11- 183,085														
SDG 8	VPA13-132,324		-												
	VPA5- 93														

VPA11- 48

VPA13- 75

D.4. Implementation of sampling plan

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List of VPAs to which the sampling plan was applied

Sampling plan was applied to all the following VPAs included in this issuance request: *VPA 004, VPA007, VPA005, VPA008, VPA011, VPA13, VPA17 and VPA18.*

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:

AMS I.A

The following steps were taken as part of the sampling procedure for VPA13, VPA17⁸ and VPA18⁹–

1. For VPA13 with more than 1 partner organization (PO), the total sales population was split per partner organization. However, this CPA has only 1 PO-SKDRDP implementing two ICS models in the state of Karnataka.
 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. 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
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⁸ No solar implementation until end of current monitoring period

⁹ No solar implementation until end of current monitoring period

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 VPA 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 Simpa Spark Series (UP) with a total sample requirement of 86 in Year-2:

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
Spark Series	Uttar Pradesh	86	0-1 (01/01/2021 to 31/12/2021)	0	0%	0	0%
			1-2 (01/01/2020 to 31/12/2020)	0	0%	0	0%
			2-3 (01/01/2019 to 31/12/2020)	0	0%	0	0%

			19)				
			3-4 (01/01/20 18 to 31/12/20 18)	0	0%	0	0%
			4-5 (01/01/20 17 to 31/12/20 17)	0	0%	0	0%
			5-6 (01/01/20 16 to 31/12/20 16)	4	~0%	0	~0%
			5-6 (01/01/20 15 to 31/12/20 15)	101	~5%	5	~5%
			5-6 (01/01/20 14 to 31/12/20 14)	1771	~95%	81	~95%

AMS III AR

The following steps were taken as part of the sampling procedure for VPA4, VPA5, VPA7, VPA8 and VPA11 -

Parameter values has been estimated by sampling in accordance with the requirements in the applied methodology separately and independently for the VPAs. 90/10 confidence/precision has been used as the criteria for reliability of sampling efforts for small-scale project activities (according to EB 69 Annex 4).

Sampling Objective – The sampling objective for each parameter is to determine via survey with statistically significant value for the emission reduction calculations. This parameter is defined in the tables presented in section D.2.

During the current monitoring period, ex post monitoring has been conducted as per AMS III A.R. Monitored values has been used in the emission reduction calculations.

Sample method – Simple random sampling has been used.

Single stage simple random sampling has been applied per CDM EB Guidelines for sampling and surveys for CDM project activities and programme of activities, Version 4. To ensure a random sample selection, random number generators has been applied. Each CEP in the target population is uniquely identifiable by its number assigned in the credit tracker platform. Each CEP within a sampling frame has been allocated a Sample Selection Number in each monitoring period, starting at 1 and increasing up to the total number of CEPs in the Credit Tracker Platform for that pre-defined sampling frame. Applying the random number generators, the CEP has been randomly chosen from the defined population up to the required sample size as calculated by the CME

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 VPA-

The VPA is implemented in Karnataka (a state in India) which has a homogenous distribution of its population. Due to the homogeneity feature of this VPA, 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 where there are multiple POs and states, sampling has been done model and state-wise.

- **Project KPT**

For determining the sample size for project fuel consumption, Annex 4 of the TPDDTEC v3.1 was referenced. The COV value was determined based on pilot data. Additionally, simple random sampling was used to select the households from the entire population.

Considering both baseline and project KPT has been conducted, samples are selected based on INDEPENDENT sampling approach mentioned in Annex 4 of the TPDDTEC v3.1. Total of 90 samples had to be selected.

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. VPA4 GSID 11476

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	16/01/2021 to 15/02/2021	31/12/2021	Yes
Project KPT	Biennial	No	-	-	Yes
Solar Lighting System	Annual	No	15/01/2021 to 20/02/2021	31/12/2021	Yes

Improved Cookstoves: Monitoring usage surveys for various parameters in this monitoring period was conducted in 10/01/2022 to 03/02/2022. 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 09/01/2021 to 25/01/2021 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. VPA5 GSID 11505

Parameter	Monitoring Frequency	CEPs added during this MP (27/06/2020 to 26/06/2021)	CEPs added during this MP (27/06/2021 to 31/12/2021)	Previous monitoring dates	Validity of Previous Monitoring results till	New Monitoring for this MP
Usage Survey	Annual	No	No	28/06/2020 to 27/07/2020	26/12/2020	Yes
Project KPT	Biennial	No	No	-	-	Yes
Solar Lighting System	Annual	No	No	28/06/2020 to 15/07/2020	26/12/2020	Yes

Improved Cookstoves: Considering usage survey is done annually, monitoring usage surveys for various parameters in this monitoring period was conducted after end of year 1 (27/06/2019 to 26/06/2021) and after end of year 2 (27/06/2021 to 31/12/2021). The survey dates for year 1 monitoring are 05/07/2021 to 20/07/2021 and survey dates for year 2 monitoring are 04/01/2022 to 20/02/2022. 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 04/07/2020 to 31/07/2020 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. VPA7 GSID 11477

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	06/01/2021 to 24/02/2021	31/12/2021	Yes
Project KPT	Biennial	No	-	-	Yes
Solar Lighting System	Annual	No	07/01/2021 to 13/02/2021	31/12/2021	Yes

Improved Cookstoves: Monitoring usage surveys for various parameters in this monitoring period was conducted in 03/01/2022 to 23/01/2022. 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 04/01/2021 to 14/02/2021 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. VPA8 GSID 11478

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

		to 31/12/2021)			
Usage Survey	Annual	No	15/01/2021 to 11/02/2021	31/12/2021	Yes
Project KPT	Biennial	No	-	-	Yes
Solar Lighting System	Annual	No	08/01/2021 to 12/02/2021	31/12/2021	Yes

Improved Cookstoves: Monitoring usage surveys for various parameters in this monitoring period was conducted in 04/01/2022 to 07/02/2022. 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 05/01/2021 to 31/01/2021 for solar lighting systems. Quarterly monitoring will be ongoing to determine the Lamp Failure Rate. For the next monitoring period fresh monitoring may be carried.

5. VPA11 GSID 11481

Parameter	Monitoring Frequency	CEPs added during this MP (27/06/2020 to 26/06/2021)	CEPs added during this MP (27/06/2021 to 31/12/2021)	Previous monitoring dates	Validity of Previous Monitoring results till	New Monitoring for this MP
Usage Survey	Annual	No	No	04/07/2020 to 25/07/2020	26/12/2020	Yes

Project KPT	Biennial	No	No	-	-	Yes
Solar Lighting System	Annual	No	No	04/07/2020 to 25/07/2020	26/12/2020	Yes

Improved Cookstoves: Considering usage survey is done annually, monitoring usage surveys for various parameters in this monitoring period was conducted after end of year 1 (27/06/2019 to 26/06/2021) and after end of year 2 (27/06/2021 to 31/12/2021). The survey dates for year 1 monitoring are 05/07/2021 to 06/08/2021 and survey dates for year 2 monitoring are 03/01/2022 to 12/02/2022. 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 01/07/2020 to 05/08/2020 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.

6. VPA13 GSID 11483

Technology	Monitoring Frequency	CEPs added during this MP (27/06/2020 to 26/06/2021)	CEPs added during this MP (27/06/2021 to 31/12/2021)	Previous monitoring dates	Validity of Previous Monitoring results till	New Monitoring for this MP
Improved cookstoves	Annual	No		27/06/2020 to 09/07/2020	26/12/2020	Yes
Project KPT	Biennial	No	No	-	-	Yes

Solar Lighting Systems	Annual	No		27/06/2020 to 09/07/2020	26/12/2020	Yes
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Improved Cookstoves: Considering usage survey is done annually, monitoring usage surveys for various parameters in this monitoring period was conducted after end of year 1 (27/06/2019 to 26/06/2021) and after end of year 2 (27/06/2021 to 31/12/2021). The survey dates for year 1 monitoring are 04/07/2021 to 09/08/2021 and survey dates for year 2 monitoring are 04/01/2022 to 11/02/2022. 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:

Considering monitoring for solar is done annually, monitoring field surveys for various parameters in this monitoring period were conducted after end of year 1 (27/06/2019 to 26/06/2021) and after end of year 2 (27/06/2021 to 31/12/2021). The survey dates for year 1 are 04/07/2021 to 15/08/2021 and survey dates for year 2 are 10/01/2022 to 20/02/2022. Quarterly monitoring will be ongoing to determine the Lamp Failure Rate. For the next monitoring period fresh monitoring may be carried.

7. VPA17 GSID 11451

Technology	Monitoring Frequency	CEPs added during the MP (27/06/2020 to 31/12/2020)	Previous Monitoring Dates	Validity of Previous Monitoring results till	New Monitoring for this MP
Improved cookstoves	Annual	No	04/01/2021 to 14/01/2021	31/12/2021	Yes
Project KPT	Biennial	No	-	31/12/2021	Yes

Improved Cookstoves: Monitoring usage surveys for various parameters in this

monitoring period was conducted in 10/01/2022 to 27/01/2022. 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:

No solar lighting systems sales have been made for this VPA. For the next monitoring period, monitoring will be carried out if sales are made

8. VPA18 GSID 11486

Technology	Monitoring Frequency	CEPs added during the MP (27/06/2020 to 31/12/2020)	Previous Monitoring Dates	Validity of Previous Monitoring results till	New Monitoring for this MP
Improved cookstoves	Annual	No	04/01/2021 to 14/01/2021	31/12/2021	Yes
Project KPT	Biennial	No	-	31/12/2021	Yes

Improved Cookstoves: Monitoring usage surveys for various parameters in this monitoring period was conducted in 14/01/2022 to 27/01/2022. 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:

No solar lighting systems sales have been made for this VPA. For the next monitoring period, monitoring will be carried out if sales are made

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

1. VPA4 GSID 11476

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	127
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 System (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: KA (2013)-140 KA (2014)-113 Actual monitored samples for: KA (2013)-155 KA (2014)-125	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 state. For e.g. if total sample size is less than 30, then minimum 30 samples are selected. For states, the total sale is less than 30, all units are sampled. Further, for some of the states KA (2013), the sample size is more than 30 therefore the required sample size is monitored. Oversampling is done for monitoring to

				account for situation if the required precision does not pass/meets. Detailed sample size for all other states and calculation is provided in Emission reduction calculation sheet.
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2. VPA5 GSID 11505

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	State	Y-1	Y-2
			KA	125	122
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 System (SKDRDP, ESAF, Muthoot, Sarala)

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: KA (2016)-64 GJ (2017)-65 UP (2017)-01	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 state. For e.g. if total sample size is less than

			Actual monitored samples for: KA (2016)-85 GJ (2017)-65 UP (2017)-01	30, then minimum 30 samples are selected. For states like UP (2017), the total sale is less than 30, all units are sampled. Further, for some of the states GJ (2017), the sample size is more than 30 therefore the required sample size is monitored. Oversampling is done for monitoring to account for situation if the required precision does not pass/meets. Detailed sample size for all other states and calculation is provided in Emission reduction calculation sheet.
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3. VPA7 GSID 11477

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	State	Samples
			KA	130
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	

Improved Cookstoves (ESAF)

S.No	Parameter	Sampling approach	Sample size
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1	Usage rate in project scenario p during year y ($U_{p,y}$)	Simple random sampling for proportion-based parameter	State	Samples
			CG	131
			MP	122
			TN	131
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 for each state	

Solar Lighting System (SKDRDP 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: JK (2019) – 26 WB (2018) - 7 TR (2018) - 42 Actual monitored samples for: JK (2019) – 53 WB (2018) - 8 TR (2018) - 58	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 state. For e.g. if total sample size is less than 30 like JK (2019), then minimum 30 samples are selected. For states like WB (2018), the total sale is less than 30, all units are sampled. Further, for some of the states TR (2018), the sample size is more than 30 therefore the required sample size is monitored. Oversampling is done for monitoring to

				account for situation if the required precision does not pass/meets. Detailed sample size for all other states and calculation is provided in Emission reduction calculation sheet.
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4. VPA8 GSID 11478

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	123
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 System (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: KA (2017)-67 KA (2018)-55	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 state. For e.g. if total

			Actual monitored samples for: KA (2017)-90 KA (2018)-77	sample size is less than 30, then minimum 30 samples are selected. For states, the total sale is less than 30, all units are sampled. Further, for some of the states KA (2017), the sample size is more than 30 therefore the required sample size is monitored. Oversampling is done for monitoring to account for situation if the required precision does not pass/meets. Detailed sample size for all other states and calculation is provided in Emission reduction calculation sheet.
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5. VPA11 GSID 11481

Improved Cookstoves(ESAF)

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	State	Y-1	Y-2
			Jumbo KA	115	125
			Jumbo KL	139	165
			Smart MH	155	173
			Smart KA	34	34
			PowerG TN	128	158

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 for each model state combination
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Solar Lighting System (Muthoot)

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: OD - 12 KA - 99 Actual monitored samples for: OD - 15 KA - 113	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. if total sample size is less than 30, then minimum 30 samples are selected. For states, the total sale is less than 30, all units are sampled. Further, for some of the states KA (2015), the sample size is more than 30 therefore the required sample size is monitored. Oversampling is done for monitoring to account for situation if the required precision does not pass/meets. Detailed sample size for all other states and calculation is

				provided in Emission reduction calculation sheet.
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6. VPA13 GSID 11483

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	State	Y-1	Y-2
			Jumbo KA	106	110
			Smart KA	125	121
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 for each model state combination		

Solar Lighting System (Sarala, Simpa and Arohan)

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: Sarala d.light M350+ (WB): 109 Arohan d.light S100 (JK): 23	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 Arohan d.light S100 (JK). For some of the models like Simpa SP Inverter 100 (OD), the

			Simpa SP Inverter 100 (OD): 17 Actual monitored samples for: Sarala d.light M350+ (WB): 109 Arohan d.light S100 (JK): 30 Simpa SP Inverter 100 (OD): 25	total number of sales is less than 30 and hence all units (25) are sampled. For some models like Sarala d.light M350+ (WB), the sample size is more than 30 and hence the required sample size (109) is randomly selected and monitored. Details on sample size for all other models and calculation is provided in Emission reduction calculation sheet.
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7. VPA17 GSID 11451

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

8. VPA18 GSID 11486

Improved Cookstoves (SKDRDP)

S.No	Parameter	Sampling approach	Sample size
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1	Usage rate in project scenario p during year y ($U_{p,y}$)	Simple random sampling for proportion-based parameter	State	Samples
			Jumbo KA	100
			Smart KA	80
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	Jumbo KA-90 Smart KA-80 ¹⁰	

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 and AMS III.AR version 7.0. When the required confidence/precision is not met for any of the Improved cookstoves (ICS) monitored parameters, the upper or lower bound is conservatively applied to arrive at final values for the parameter as per TPDDTEC v3.1. This approach of calculating the precision and applying the upper/lower bound to the results is a conservative approach. These details are included in the emission reduction calculation sheets for the VPAs.

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

¹⁰ Total sales of Smart Stove in Karnataka are 80.

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 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

SDG 13: Climate Action (Improved Cookstoves)

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

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

Where:

$\sum_{b,p}$	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 ₂ e/yr)

For example, calculation for baseline emission for Jumbo Stove Karnataka for VPA7 has been demonstrated below:

$$ER_y = 8,159,575 * 0.61 * (0.00699 - 0.0034) * 0.0156 * (0.86 * 112 + 37.25) - 0$$

$$= 36,688 \text{ tCO}_2\text{e}$$

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 VPA4, VPA5, VPA7, VPA8, VPA11, VPA13, VPA17 and VPA18 requesting issuance as part of this monitoring report is 441,096 tCO₂e.

13: Climate Action (Solar Lighting Systems)

AMS III.AR v7.0

The emissions reductions for solar lighting projects under AMS-III.AR are determined from equation (5) of the methodology, mentioned below:

$$ER_y = \sum_{i,j} N_{i,j} \times (BE_{y,i} - PE_{y,i,j}) \times (OF_{y,i,j})$$

Parameter	Unit	Value
ER_y	tCO ₂ e	Emission reductions in year y
$N_{i,j}$	Number of project lamps	Number of project lamps distributed to end users of type i with charging method j
$BE_{y,i}$	tCO ₂ e	Baseline emissions per project lamp in year y
$PE_{y,i}$	tCO ₂ e	Project emissions per project lamp in year y
$OF_{y,i,j}$	%	Percentage of project lamps distributed to end users that are operating and in service in year y , for each lamp type i and charging method j . Assumed to be equal to 100 per cent for years 1, 2 and 3, and equal to the value determined in paragraph 36, for years 4, 5, 6 and 7

The baseline emissions per project lamp in year y are calculated using equation (3) of the methodology, mentioned below:

$$BE_y = DV \times GF_y \times DB_y$$

(Eq. 3)

Parameter	Unit	Value
BE_y	tCO ₂ e	Baseline emissions per project lamp in year y
DV	tCO ₂ e per project lamp	Lamp Emission Factor (default is 0.092 tCO ₂ e per project lamp)
GF_y	-	Grid Factor in year y , • Equal to 1.0 when charging option defined in paragraph 3(a) is used; • Equal to 1.0 if the project activity is for off-grid households/communities (defined as no grid access or less than 12 hours grid availability per day on an annual average basis); • Otherwise it is equal to 1.0 minus (the fraction of time grid is available to the target households and communities/users in the region of project activity)
DB_y	-	Dynamic Baseline Factor (change in baseline fuel, fuel use rate, and/or utilization during crediting period) in year y . Calculated as either:

		- Option 1: default of 1.0 in the absence of relevant information; - Option 2: value of 1.0+FFg where FFg is the documented national growth rate of kerosene fuel use in lighting from the preceding years (use the most recent available data for a three or five years average fraction)
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In line with paragraph 29 of the methodology, there are no project emissions as the project lamp charging mechanism utilizes a renewable energy system (solar photovoltaic panel) included as part of the project lamp. Thus,

$$PE_{y,i} = 0$$

Here, the Lamp Emission Factor is determined through the following equation (2) of the methodology, mentioned below:

$$DV = FUR \times O \times U \times EF \div 1000 \times LF \times n \times NTG$$

(Eq. 2)

Parameter	Unit	Value
DV	tCO ₂ e per project lamp	Lamp Emission Factor (default is 0.092 tCO ₂ e per project lamp)
FUR	liters/hour	Fuel use rate (0.03 liters/hour)
O	hours/day	Utilization rate (3.5 hours/day)
U	days/year	Annual utilization (365 days/year)
EF	kgCO ₂ /liter	Fuel emissions factor (2.4 kgCO ₂ /liter)
LF	-	Leakage factor (1.0)
n	-	Number of fuel-based lamps replaced per project lamp (1.0)
NTG	-	Net-to-gross adjustment factor (1.0)

Sample calculation for Karnataka 2013 for a model with 4 lights for VPA4:

$$\begin{aligned}
 DV &= 0.03 \times 3.5 \times 365 \times 2.4 / 1000 \times 1 \times 1 \\
 &= 0.092 \text{ tCO}_2\text{e}
 \end{aligned}$$

$$\begin{aligned}
 BE_y &= DV \times GF_y \times DB_y \\
 &= 0.092 \times 1 \times 1 = 0.092 \text{ tCO}_2\text{e}
 \end{aligned}$$

$$ER_y = N_{i,j} * (BE_y - PE_y) * OF_y$$

$$\begin{aligned}
 &= 4 * (0.092 * 78 / 365 - 0) * 68\% \\
 &= 0.0786 * 68\% \\
 &= 0.0534 \text{ tCO}_2\text{e}
 \end{aligned}$$

The above calculation is just one sample calculation. The baseline emissions for solar lamps included in the VPA4, VPA5, VPA7, VPA8 and VPA11 requesting issuance as part of this monitoring report 54,659 tCO₂e.

AMS I.A v14.0

$$BE_v = \sum_{i=1}^n BE_{i,v}$$

Parameter	Unit	Type	Value
BE_v	tCO ₂	Calculated	Emissions generated in the absence of the project activity in period v by all lamps
$BE_{i,v}$	tCO ₂	Calculated	Emissions generated in the absence of the project activity in period v by all lamps of type i

Ex post baseline emission for each lamp type i is calculated with the following equation:

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

Parameter	Unit	Type	Value
$BE_{i,v}$	tCO ₂	Calculated	Emissions generated in the absence of the project activity in period v by all lamps of type i
$N_{i,a}$	-	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 number of hours solar lamps are used per day
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

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

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.

Sample calculation for solar lighting systems for product model Arohan d.light S500 for the state of Assam for VPA13

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

$$BE_v = (27,406 * 187) * 140.54 * 3.5 * (1/0.13) * 0.0719 * 10^{-6} * 3.6 * 98.27\% \\ = 4,936.31 \text{ tCO}_2$$

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 VPA13 requesting issuance as part of this monitoring report is 58,798 tCO₂e.

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

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SDG 1: No Poverty

BSA_{project} = Number of households with clean energy products

Net Benefit (SDG 1) = BSA_{Project} – BSA_{Baseline}

ICS

VPA Number	BSA_{Project}	BSA_{Baseline}	Net Benefit
VPA4	29,937	0	29,937
VPA5	19,963	0	19,963
VPA7	28,495	0	28,495
VPA8	23,337	0	23,337
VPA11	14,220	0	14,220
VPA13	27,000	0	27,000
VPA17	26,921	0	26,921
VPA18	26,080	0	26,080

SLS

VPA Number	BSA_{Project}	BSA_{Baseline}	Net Benefit
VPA4	19,794	0	19,794
VPA5	81,045	0	81,045
VPA7	46,822	0	46,822
VPA8	11,671	0	11,671
VPA11	242,588	0	242,588
VPA13	138,762	0	138,762
VPA17	0	0	0
VPA18	0	0	0

SDG 3: Good Health and Well Being

$SPM_{HH,Project}$ % HH confirming less smoke with the use of improved cookstove

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

ICS

VPA Number	$SPM_{HH,Project}$	$SPM_{HH,Baseline}$	Net Benefit
VPA4	64%	0	64%
VPA5	62%	0	62%
VPA7	66%	0	66%
VPA8	68%	0	68%
VPA11	64%	0	64%
VPA13	73%	0	73%
VPA17	86%	0	86%
VPA18	83%	0	83%

SDG 5: Gender Equality

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

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

ICS

VPA Number	$HHTS_{Project}$	$HHTS_{Baseline}$	Net Benefit
VPA4	64%	0	64%
VPA5	62%	0	62%
VPA7	66%	0	66%
VPA8	68%	0	68%
VPA11	64%	0	64%
VPA13	73%	0	73%
VPA17	86%	0	86%
VPA18	83%	0	83%

SDG 7: Affordable and Clean Energy

$ACS_{Project}$ Access to affordable and clean energy (Number of operating ICS/SLS units under Project)

Net Benefit (SDG 7) = $ACS_{Project} - ACS_{Baseline}$

ICS

VPA Number	$ACS_{Project}$	$ACS_{Baseline}$	Net Benefit
VPA4	17,127	0	17,127
VPA5	11,013	0	11,013

VPA7	17,036	0	17,036
VPA8	14,228	0	14,228
VPA11	9,005	0	9,005
VPA13	19,809	0	19,809
VPA17	23,152	0	23,152
VPA18	21,648	0	21,648

SLS

VPA Number	ACS _{Project}	ACS _{Baseline}	Net Benefit
VPA4	14,375	0	14,375
VPA5	66,137	0	66,137
VPA7	35,522	0	35,522
VPA8	9,421	0	9,421
VPA11	183,085	0	183,085
VPA13	132,324	0	132,324
VPA17	0	0	0
VPA18	0	0	0

SDG 8: Decent Work and Economic Growth

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

Net Benefit (SDG 8) = QE IG_{Project} - QE IG_{Baseline}

VPA Number	QE IG _{Project}	QE IG _{Baseline}	Net Benefit
VPA4	30	0	30
VPA5	93	0	93
VPA7	60	0	60
VPA8	30	0	30
VPA11	48	0	48
VPA13	75	0	75
VPA17	30	0	30
VPA18	30	0	30

E.3. Calculation of leakage

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Leakage for all VPAs for this monitoring period = 0

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

SD G	SDG Impact	Baseline estimate	Project estimate	Net benefit
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13	Amount of VERs		VPA 4- 44,620 VPA 5-68,446 VPA 7-52,851 VPA 8- 41,172 VPA 11-59,473 VPA 13-152,786 VPA 17- 68,813 VPA 18- 66,392	0	VPA 4- 44,620 VPA 5-68,446 VPA 7-52,851 VPA 8- 41,172 VPA 11-59,473 VPA 13-152,786 VPA17- 68,813 VPA18- 66,392
1	Number of households with clean energy products (ICS)	0	VPA 4-29,937 VPA 5-19,963 VPA 7-28,495 VPA 8-23,337 VPA 11-14,220 VPA 13-27,000 VPA 17-26,921 VPA 18-26,080		VPA 4-29,937 VPA 5-19,963 VPA 7-28,495 VPA 8-23,337 VPA 11-14,220 VPA 13-27,000 VPA 17-26,921 VPA 18-26,080
1	Number of households with clean energy products (SLS)	0	VPA 4-19,794 VPA 5-81,045 VPA 7-46,822 VPA 8-11,671 VPA 11-242,588 VPA 13-138,762 VPA17-0 VPA18-0		VPA 4- 19,794 VPA 5- 81,045 VPA 7-46,822 VPA 8-11,671 VPA11-242,588 VPA13-138,762 VPA17-0 VPA18-0
3	% Households confirming less smoke with use of ICS	0%	VPA 4-64% VPA 5-61% VPA 7-67% VPA 8-68% VPA 11-64% VPA 13-73% VPA 17- 86% VPA 18 – 83%		VPA 4-64% VPA 5-61% VPA 7-67% VPA 8-68% VPA 11-64% VPA 13-73% VPA 17- 86% VPA 18 – 83%
5	% Households confirming time saving with cooking and fuel collection	0%	VPA 4-64% VPA 5-61% VPA 7-67% VPA 8-68% VPA 11-64% VPA 13-73% VPA 17- 86% VPA 18 – 83%		VPA 4-64% VPA 5-61% VPA 7-67% VPA 8-68% VPA 11-64% VPA 13-73% VPA 17- 86% VPA 18 – 83%
7	Number of beneficiaries (ICS)	0	VPA 4-17,127 VPA 5-11,013 VPA 7-17,036 VPA 8-14,228		VPA 4-17,127 VPA 5-11,013 VPA 7-17,036 VPA 8-14,228

		VPA 11-9,005	VPA 11-9,005
		VPA 13-19,809	VPA 13-19,809
		VPA 17-23,152	VPA 17-23,152
		VPA 18-21,648	VPA 18-21,648
		VPA 4-14,375	VPA 4-14,375
		VPA 5-66,137	VPA 5-66,137
		VPA 7-35,522	VPA 7-35,522
		VPA 8-9,421	VPA 8-9,421
		VPA 11-183,085	VPA 11-183,085
		VPA 13-132,324	VPA 13-132,324
		VPA17-0	VPA17-0
		VPA18-0	VPA18-0
		VPA 4- 30	VPA 4- 30
		VPA 5- 93	VPA 5- 93
		VPA 7- 60	VPA 7- 60
		VPA 8- 30	VPA 8- 30
		VPA 11- 48	VPA 11- 48
		VPA 13- 75	VPA 13- 75
		VPA 17- 30	VPA 17- 30
		VPA 18- 30	VPA 18- 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 ¹¹ achieved during this monitoring period
	VPA 4- 91,930	VPA 4- 44,620
	VPA 5-109,019	VPA 5-68,446
	VPA 7-94,468	VPA 7-52,851
	VPA 8- 72,137	VPA 8- 41,172
13	VPA 11-174,536	VPA 11-59,473
	VPA 13-1,154,425	VPA 13-152,786
	VPA 17-85,788	VPA 17- 68,813
	VPA 18-81,815 tCO ₂ e	VPA 18- 66,392 tCO ₂ e

¹¹ Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

1 (ICS)	VPA 4-29,937	VPA 4-29,937
	VPA 5-19,963	VPA 5-19,963
	VPA 7-28,495	VPA 7-28,495
	VPA 8-23,337	VPA 8-23,337
	VPA 11-14,220	VPA 11-14,220
	VPA 13-27,000	VPA 13-27,000
	VPA 17-26,921	VPA 17-26,921
	VPA 18-26,080	VPA 18-26,080
1 (SLS)	VPA 4-19,794	VPA 4-19,794
	VPA 5-81,045	VPA 5-81,045
	VPA 7-46,822	VPA 7-46,822
	VPA 8-11,671	VPA 8-11,671
	VPA 11-242,588	VPA 11-242,588
	VPA 13-200,000	VPA 13-138,762
	VPA17-0	VPA17-0
	VPA18-0	VPA18-0
3	VPA 4-100%	VPA 4-64%
	VPA 5-100%	VPA 5-61%
	VPA 7-100%	VPA 7-67%
	VPA 8-100%	VPA 8-68%
	VPA 11-100%	VPA 11-64%
	VPA 13-100%	VPA 13-73%
	VPA17-100%	VPA 17- 86%
	VPA18-100%	VPA 18 – 83%
5	VPA 4-100%	VPA 4-64%
	VPA 5-100%	VPA 5-61%
	VPA 7-100%	VPA 7-67%
	VPA 8-100%	VPA 8-68%
	VPA 11-100%	VPA 11-64%
	VPA 13-100%	VPA 13-73%
	VPA17-100%	VPA 17- 86%
	VPA18-100%	VPA 18 – 83%
7 (ICS)	VPA 4-26,943	VPA 4-17,127
	VPA 5-17,697	VPA 5-11,013
	VPA 7-25,646	VPA 7-17,036
	VPA 8-21,004	VPA 8-14,228
	VPA 11-12,798	VPA 11-9,005
	VPA 13-24,300	VPA 13-19,809
	VPA 17-24,229	VPA 17-23,152
	VPA 18-23,803	VPA 18-21,648
7 (SLS)	VPA 4-19,794	VPA 4-14,375
	VPA 5-81,045	VPA 5-66,137
	VPA 7-46,822	VPA 7-35,522
	VPA 8-11,671	VPA 8-9,421

	VPA 11-242,588	VPA 11-183,085
	VPA 13-1,557,487	VPA 13-132,324
	VPA17-0	VPA17-0
	VPA18-0	VPA18-0
8	VPA 4- 20	VPA 4- 30
	VPA 5- 20	VPA 5- 93
	VPA 7- 20	VPA 7- 60
	VPA 8- 20	VPA 8- 30
	VPA 11-20	VPA 11- 48
	VPA 13-20	VPA 13- 75
	VPA 17-20	VPA 17- 30
	VPA 18-20	VPA 18- 30

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

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

To achieve a comparable value of estimates for this monitoring period for VPA4, 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-1 and Year-2 of CP-2 of operation of the VPAs from start date of crediting period is considered.
- The estimation of ex ante value is made for 78 days (Year 1) and 287 days (Year 2) totaling to 365 days (which is crediting days for this monitoring period¹²).

To achieve a comparable value of estimates for this monitoring period for VPA5, 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

¹² For detailed calculation of "Amount estimated ex ante for this monitoring period in the VPA-DD (t CO₂e)" of this VPA, please refer to the emission reduction calculation sheet.

estimation. Total ex ante estimated value for Year-1 and Year-2 of operation of the VPAs from start date of crediting period is considered.

- The estimation of ex ante value is made for 266 days (Year 1) and 287 days (Year 2) totaling to 553 days (which is crediting days for this monitoring period¹³.

To achieve a comparable value of estimates for this monitoring period for VPA7, 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-1 and Year-2 of CP-2 of operation of the VPAs from start date of crediting period is considered.
- The estimation of ex ante value is made for 120 days (Year 1) and 245 days (Year 2) totaling to 365 days (which is crediting days for this monitoring period¹⁴.

To achieve a comparable value of estimates for this monitoring period for VPA8, 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-1 and Year-2 of CP-2 of operation of the VPAs from start date of crediting period is considered.
- The estimation of ex ante value is made for 120 days (Year 1) and 245 days (Year 2) totaling to 365 days (which is crediting days for this monitoring period¹⁵.

To achieve a comparable value of estimates for this monitoring period for VPA11, 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. The monitoring period is spanning across CP-1 and CP-2. Total ex ante estimated value for Year-4 and Year-5 of CP-1 and Year-1 of CP-2 of operation of the VPAs from start date of crediting period is considered.

¹³ For detailed calculation of "Amount estimated ex ante for this monitoring period in the VPA-DD (t CO₂e)" of this VPA, please refer to the emission reduction calculation sheet.

¹⁴ For detailed calculation of "Amount estimated ex ante for this monitoring period in the VPA-DD (t CO₂e)" of this VPA, please refer to the emission reduction calculation sheet.

¹⁵ For detailed calculation of "Amount estimated ex ante for this monitoring period in the VPA-DD (t CO₂e)" of this VPA, please refer to the emission reduction calculation sheet.

- The estimation of ex ante value is made for 163 days (Year 4-CP1), 365 days (Year 5-CP1) and 25 days (Year 1-CP2) totaling to 553 days (which is crediting days for this monitoring period¹⁶.

To achieve a comparable value of estimates for this monitoring period for VPA13, 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, Year-3 and Year-4 of CP-1 of operation of the VPAs from start date of crediting period is considered.
- The estimation of ex ante value is made for 59 days (Year 2), 365 days (Year 3) and 129 days (Year 4) totaling to 553 days (which is crediting days for this monitoring period¹⁷.

To achieve a comparable value of estimates for this monitoring period for VPA17 and VPA18 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 CP-1 of operation of the VPAs from start date of crediting period is considered.
- The estimation of ex ante value is made for 24 days (Year 2) and 341 days (Year 3) totaling to 365 days (which is crediting days for this monitoring period¹⁸.

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.

¹⁶ For detailed calculation of "Amount estimated ex ante for this monitoring period in the VPA-DD (t CO₂e)" of this VPA, please refer to the emission reduction calculation sheet.

¹⁷ For detailed calculation of "Amount estimated ex ante for this monitoring period in the VPA-DD (t CO₂e)" of this VPA, please refer to the emission reduction calculation sheet.

¹⁸ For detailed calculation of "Amount estimated ex ante for this monitoring period in the VPA-DD (t CO₂e)" of this VPA, please refer to the emission reduction calculation sheet.

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			
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	No	Not relevant	Not required
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.			
b. Slavery, imprisonment, physical and mental drudgery, punishment or coercion of women and girls.			
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
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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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NA¹⁹

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

¹⁹ 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