

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
- $\underline{0}$ Description of monitoring system applied by the project
- <u>0</u> Data and parameters
- 0 Calculation of SDG Impacts
- 0 Safeguards Reporting
- $\underline{0}$ Stakeholder inputs and legal disputes

KEY PROJECT INFORMATION

Programme of Activity Information

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

TEMPLATE- Monitoring Report

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 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 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
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	SDG Impact	Amount Achieved	Units/
Development			Products
Goals Targeted			

13 Climate Action (mandatory)	Number 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	tCO₂e VERs
1 End poverty in all its forms everywhere	Number of households with clean energy products	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	Number ICS
1 End poverty in all its forms everywhere	Number of households with clean energy products	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	Number of SLS
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 VPA 5-66,137 VPA 7-35,522 VPA 8-9,421 VPA 11-183,085	Number

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

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 Referenc e 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 <u>TPDDTEC version 3.1</u>

 $^{^{\}rm 6}$ As these are CDM Transitioned projects, GS4GG allows a total crediting period of 15-years from the CDM crediting start date.

<u>Purpose</u>: 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.

<u>Measures taken</u>: 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

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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
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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 $44,620 \text{ tCO}_2\text{e}$.

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 –

<u>Purpose</u>: 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.

<u>Measures taken</u>: 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

Gold Standard *Climate Security and Sustainable Development*

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 –

<u>Purpose</u>: 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.

<u>Measures taken</u>: 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 $52,851 \text{ tCO}_2\text{e}$.

VPA8 - GS ID: GS11478

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

<u>Purpose</u>: Under the VPA, 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.

<u>Measures taken</u>: 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):

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

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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 yearRelevant 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 $41,172 \text{ tCO}_2\text{e}$.

VPA11 - GS ID: GS11481

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

<u>Purpose</u>: Under the VPA, Micro Energy Credits works with PO – 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.

<u>Measures taken</u>: 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-

<u>Purpose</u>: 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.

<u>Measures taken</u>: 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 a 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

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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

Gold Standard *Climate Security and Sustainable Development*

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 315Luminosity – 5400 lumenLighting Wattage – 4 WattAverage 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 $152,786 \text{ tCO}_2$.

VPA17 - GS ID: GS11451

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

<u>Purpose</u>: Under the VPA, Micro Energy Credits works with PO - 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.

<u>Measures taken</u>: 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.
- 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.
- 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 $68,813 \text{ tCO}_2\text{e}$.

VPA18 - GS ID: GS11486

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

<u>Purpose</u>: Under the VPA, Micro Energy Credits works with PO – 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.

<u>Measures taken</u>: 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 $66,392 \text{ tCO}_2\text{e}$.

e. Avoiding double counting -

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

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

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

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

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NA

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

>>

NA

B.2.5. Changes to project design of approved project

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NA

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

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

<u>Monitoring system and monitoring plan of VPAs –</u> The Credit Tracker Platform enables Micro Energy Credits to maintain consistent data on all VPAs and product installations. The process for entering data into the Credit Tracker Platform will be consistent across all VPAs. At the time of installation, the PO creates a Booking Record (in paper or electronic format) that captures detailed data on the installation:

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

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

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

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

• Unique identifier number for CEP

- Date of monitoring
- Usage status at time of monitoring

The monitoring activity provides a framework for project preparation and monitoring processes that 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. Therecord 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 transferagreements received from individual households.

Quality assurance

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

Generalities

The CME along with the PO coordinated all ex-post monitoring activities. The CME is ultimately responsible for implementing the monitoring plan, ensuring the quality of data obtained and the use of this data for emissions reduction calculations. However, the actual field measurements to be conducted during monitoring (e.g. 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 defau	ult baseline fuelw	ood consumption
Value(s) applied	VPA Number	State	Values
	VPA 04	Karnataka	7.02
	VPA 05	Karnataka	7.77
	VPA 07	Karnataka	6.99
		Tamil Nadu	6.85
		Chhattisgarh	6.99
		Madhya	7.13
		Pradesh	
	VPA 08	Karnataka	7.11
	VPA 11	Karnataka	7.13
		Kerala	6.93
		Maharashtra	7.19
		Tamil Nadu	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 se	ection B.4 of the	VPA-DD.
Purpose of data	For baseline emission	on calculations	
Additional comment	-		

Data/parameter	EF _{b,i,CO2}
Unit	tCO ₂ /t _{fuel}
Description	CO_2 emission factor arising from use of fuel type <i>i</i> in baseline scenario
Source of data	Wood: Methodology default
Value(s) applied	Fuelwood / wood chips: 112 tCO2/TJ

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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	Methodology defaults have been applied for wood				
Measurement methods	Parameter	Value	Average	Units	Source
and procedures		258 -	1224	kgCO2/TJ	
	EF_wood_CH4	2190			
		4 –	11.25	KgCO2/TJ	
	EF_wood_N2O	18.5			
	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 emi	ssion cal	culations		
Additional comment	-				

EF _{p,i,CO2}
tCO ₂ /t _{fuel}
CO_2 emission factor arising from use of fuel type <i>i</i> in project scenario
Wood: Methodology default
Fuelwood / wood chips: 112 tCO2/TJ
Default IPCC values have been applied
For project emission calculations
-

Data/parameter

EF_{p,i,nonCO2}

Unit	tCO ₂ /TJ				
Description	Non-CO ₂ emission factor arising from use of fuel type 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 tCO2e/TJ (AR5 GWP)				
Choice of data or	Default methodology values have been applied for wood				
Measurement methods	Parameter	Value	Average	Units	Source
and procedures		258 -	1224	kgCO2/TJ	
	EF_wood_CH4	2190			
		4 –	11.25	KgCO2/TJ	
	EF_wood_N2O	18.5			
	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 project emis	sion calc	ulations		
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

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Choice of data or Measurement methods	Default IPCC values for wood / wood waste are applied.
and procedures	
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 y		
Source of data	Calculation as per CDM methodology Tool 30 version 3.0		
Value(s) applied	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
Choice of data or Measurement methods and procedures	N.A.		
Purpose of data	For emission reduction calculations		
Additional comment	-		

For Solar Lighting Systems

VPAs 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)
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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. Anothe 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/wat for hurricane lamps from Louineau et al (1994) is chosen being conservative with respect to the lower value of 0.1		
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

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Source of data	2006 IPCC guidelines for National Greenhouse Gas inventories		
Value(s) applied	0.0719		
Choice of data or Measurement methods and procedures	The default value of other kerosene in 2006 IPCC guidelines for National Greenhouse Gas Inventories is 71.900 tCO2/TJ.		
Purpose of data	Calculation of baseline emissions		
Additional comment	The parameter is fixed for the entire crediting period.		

Data/parameter	Z
Unit	n/a
Description	Standard normal for a confidence interval of 90%
Source of data	Köhler, Schachtel, Voleske, 2002; Biostatistik, Springer Verlag Berlin Heidelberg; Tafel 2, p. 279
Value(s) applied	1.290, 1.645; 1.96
Choice of data or Measurement methods and procedures	The statistical standard value for standard normal for a confidence level of 90% for one-sided test which is 1.290 as the parametric values are appropriate for a one-sided test.
Purpose of data	Calculation of baseline emissions
Additional comment	-

D.2 Data and parameters monitored

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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	
	VPA17	Jumbo/KA	3.2	
	VPA18	Jumbo/KA	3.0	
		Smart/KA	2.9	
Measurement methods and procedures	Project KPT has bee	en conducted		
Monitoring frequency	Updated every two	years		
QA/QC procedures	CME has provid enumerators/expert requirement of the r testing is externally time of use so r necessary guarante done annually. Type – Digital Moist Accuracy Class - +/ Serial number – TM240016, TM2865 TM157277 Calibration frequence Date of calibration – Validity – Until 18/0 Serial number – X01 X014104, X014102, Calibration frequence Date of calibration – Validity – Until 15/1	ded guidance ts for conducting k methodology. The calibrated or new measurements a ces. Calibration of ture Meter - 1% TM157341, TM 57, TM240017, TK 57, TM240017, TK 57, TM240017, TK cy – Annual - 19/02/2021 02/2022 14064, X014086, X014082, X0140 cy – Annual - 16/12/2021 .2/2022	and training to XPTs to meet specific e equipment used for wly purchased at the are done with the of the equipment is 157285, TM28591, M28618, TM239929, X013975, X014073, 049,	
	Type - Weighing Sc Accuracy Class - +/ Serial number - WS00132, WS0015 WS00136, Calibration frequence Date of calibration - Validity - Until 14/0	ale - 0.5 grams WS00120, WS 56, WS00151, W cy – Annual - 15/02/2021 02/2022	500123, WS12012, S00153, WS00436,	

	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 Moni	toring Period: 01/0)1/20	21 to 31/	12/2021
		Model/State	Valı	165-Yr1	Values-Yr2
	VPA5	Smart/KA	56%		54%
	VPA11	Smart/KA	74%)	68%
		Jumbo/KA	55%)	53%
		Jumbo/KL	66%	0	62%
		Smart/MH	66%	D	61%
		Powergram/TN	66%)	60%
	VPA13	Smart/KA	76%)	70%
		Jumbo/KA	76%	0	71%
Measurement methods and procedures	Sampling record th	g surveys (physic le continued opera	cal) ł tion c	nas been of project	conducted to 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 (Numbe	er)
Description	Technologies in the p through year y	project Database	for project scenario
Source of data	Total sales record		
Value(s) applied	VPA	Model/State	Values

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	VPA4	Smart/KA	29,937
	VPA5	Smart/KA	19,963
	VPA7	Smart/KA	23,337
		Smart/CG	2,492
		Smart/MP	1,689
		Smart/TN	977
	VPA8	Smart/KA	23,337
	VPA11	Smart/KA	34
		Jumbo/KA	555
		Jumbo/KL	4,950
		Smart/MH	7,353
		Powergram/TN	1,328
	VPA13	Smart/KA	27,000
	VPA17	Jumbo/KA	26,921
	VPA18	Jumbo/KA	26,000
		Smart/KA	80
Measurement methods and procedures	Number of stoves li	sted in the Monito	oring 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 database which is a reported in the QPR	monitoring purp subset of the nu has been used.	oses, the end user mber of installations

Data / Parameter	LE _{p,y}		
Unit	tCO₂e per year		
Description	Leakage in project scenario p during year y		
Source of data	Monitoring surveys	for Leakage asses	ssment
Value(s) applied	VPA	Model/State	Values
	VPA4	Smart/KA	0
	VPA5	Smart/KA	0
	VPA7	Smart/KA	0
		Smart/CG	0
		Smart/MP	0
		Smart/TN	0
	VPA8	Smart/KA	0
	VPA11	Smart/KA	0
		Jumbo/KA	0
		Jumbo/KL	0
		Smart/MH	0
		Powergram/TN	0

	VPA13	Smart/KA	0
	VPA17	Jumbo/KA	0
	VPA18	Jumbo/KA	0
		Smart/KA	0
Measurement methods and procedures	Qualitative / quantit	tative assessmen	t
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	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 platfo	rm	
Value(s) applied	Year	State	Total Lamps
	2013	Karnataka	7,342
	2014	Karnataka	10,341
	2015	Karnataka	24,660
	2016	Karnataka	13,999
	Total		56,342
Measurement methods and procedures	The data has been platform. The data units sold, to whore	en recorded in a wel consists of unique nu n and where	b based tracker mber, number of
Monitoring frequency	Annual		
QA/QC procedures	Each solar lighting each system, has System. Associate Database, allowing	system, and number been recorded in th data resides in th each installation to b	of solar lamps in ne MEC Tracker ne MEC Tracker e monitored.
Purpose of data	Calculation of proje	ect emissions	
Additional comment	-		

Data/parameter

 GF_{y}

TEMPLATE- Monitoring Report

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	DBy
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	Year State Total Lamps			
	2016	Karnataka	3,894	
		Assam	180	
		Bihar	273	
		Gujarat	1,818	
		Karnataka	6,321	
	2017	Kerala	11,706	
	2017	Madhya Pradesh	448	
		Odisha	1,866	
		Tamil Nadu	5,584	
		Uttar Pradesh	1	
		West Bengal	4,525	
		Gujarat	5,349	
		Haryana	108	
		Jharkhand	2	
		Karnataka	5,830	
		Kerala	12,882	
	2018	Madhya Pradesh	1,279	
		Odisha	3,075	
		Rajasthan	3	
		Tamil Nadu	19,884	
		Uttar Pradesh	92	
		West Bengal	1,100	
	Total		86,220	

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	GFy
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	DBy
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 State Crediting Period 2			Period 2
	year			
	-		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	0.83	0.83
		Pradesh		
	2018	Madhya	0.82	0.82
		Pradesh		
	2017	Odisha	0.83	0.83
	2018	Odisha	0.86	0.86
	2018	Rajasthan	1.0	1.0
	2017		0.79	0.79
	2018	Tamii Nadu	0.81	0.81
	2017	Uttar Pradesh	1.0	0.96
	2010	Wost Bongal	0.80	0.00
	2017	West Bengal	0.82	0.84
Manager and the standard			0.04	
measurement methods	Default value for the first three years of operation of a			
and procedures		will be determine	Post three ye	sic of compling
	4-7, this value	out in year 3	eu on the bas	sis of sampling
Monitoring frequency		for three years.	Determiner	l an bacad of
Monitoring Trequency	survey conducted in year 3 for years 4-7			
QA/QC procedures	-			
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					
	Year State Total Lamps				
		26484			
		Assam	4106		
		Bihar	2553		
	2017	Jharkhand	321		
		Odisha	394		
		West Bengal	48		
		Uttar Pradesh	103		
		Karnataka	49763		
		Assam	4647		
		Bihar	2431		
	2018	Jharkhand	585		
		Odisha	599		
		Tripura	867		
		West Bengal	20		
		Кагпасака	28091		
		Bibar	1325		
	2019	Ibarkhand	238		
	2015	Odisha	207		
		Tripura	481		
		West Bengal	26		
	Total	<u>j</u>	126,504		
Measurement methods	The data has been	n recorded in a	, web based tracker		
and procedures	platform. The data	consists of uniau	le number, number of		
	units sold, to whom and where				
Monitoring frequency	Annual				
QA/QC procedures	Each solar lighting s	system, and nun	nber 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	GFy
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	DBy
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 State Crediting Period 2 year				
			Year Year 2 1		
	2017	Karnataka	0.71	0.71	

	4 · · · · · · · · · · · · · · · · · · ·			
	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	0.78	0.78
		Bengal		
	2018	West	0.75	0.75
		Bengal		
	2019	West	0.89	0.89
		Bengal		
	2017	Uttar Pradesh	0.84	0.84
Measurement methods	Default value	for the first	three ve	ears of operation of a
and procedures	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 platfo	rm	
Value(s) applied	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 proje	ect emissions		
Additional comment	-			

Data/parameter	GFy
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	DBy
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	7
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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	IationStateCrediting 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	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				
	Year	State	Total Lamps	
	2015	Karnataka	9,177	
		Kerala	50,375	
		Maharashtra	9,940	
		Tamil Nadu	26,883	
		Karnataka	10,819	
	2016	Kerala	39,162	
		Gujarat	3,246	
		Madhya Pradesh	293	

	Maharashtra	8,053	
	Odisha	15	
	Tamil Nadu	45,325	
	Uttar Pradesh	188	
	Karnataka	5,598	
	Kerala	11,783	
	Gujarat	1,875	
2017	Madhya Pradesh	380	
	Maharashtra	19	
	Odisha	2,405	
	Tamil Nadu	17,052	
Total		242,588	
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			
Annual			
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.			
Calculation of project emissions			
-			
	2017 <i>Total</i> <i>Total</i> The data has be platform. The data units sold, to whe Annual Each solar lighting each system, he System. Associate Database, allowing Calculation of pro-	MaharashtraOdishaTamil NaduUttar PradeshKarnatakaKeralaGujarat2017Madhya PradeshMaharashtraOdishaTotalThe data has been recorded in platform. The data consists of uniquits sold, to whom and whereAnnualEach solar lighting system, and nu each system, has been recorded System. Associated data resides Database, allowing each installatio Calculation of project emissions	

Data/parameter	GFy
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	DBy
Unit	-

TEMPLATE- Monitoring Report

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	stallation State Crediting Crediting ar Period 1 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	0.74	0.74	0.74
		Pradesh			
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 t survey conduct	for three years ted in year 3 fo	s. Dete or years	rmined 4-7	on based of
QA/QC procedures	-				
Purpose of data	Calculation of baseline emissions				
Additional comment	-				

<u> VPA13 – GS11483</u>

Data / Parameter	In
Unit	Lumens
Description	Lumen output of each solar lamp n deployed as part of project activity
Source of data	Table 4, 2021 value
Value(s) applied	1. 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)
	 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)
	 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)
	 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)

- 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	Will be recorded at time of sale/installation in MEC Credit
Monitoring frequency	
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	
	Sarala		
	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 other specific location System. Associated dat Database, allowing each a regular basis. The dat crosschecked with the l	s geocoded (GPS coordinates or identifiers) in the MEC Tracker ta will reside in the MEC Tracker h installation to be monitored on ta in MEC tracker system can be MIS system of the PO.
Purpose of data	Calculation of baseline	emissions

Gold Standard	Climate Security and	' Sustainable Development
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Additional	comment

39 models of Simpa, 7 models of Sarala and 4 models of Arohan are distributed under this VPA

Data / Parameter	d _{i,a,v}			
Unit	Days			
Description	Average number of days lamps of type i that have been deployed in period a were operating in period v			
Source of data	Monitoring partner, Cre	edit Tracker		
Value(s) applied	Year-			Year-
	Model	State	1	2
	Magic TV	Uttar Pradesh	341	1/6
		Bihar	365	100
	Magic TV P80	Odisha	365	100
		Bihar	365	100
	PHOENIX 120	Uttar Pradesh	365	100
	Pico	Uttar Pradesh	353	182
		Uttar Pradesh	342	176
	Power 80	Bihar	347	1/9
		Odisha	349	180
	Power Lite	Bihar	355	183
		Uttar Pradesh	365	188
	Power_55	Bihar	365	188
		Odisha	348	1/9
	Power_Max	Uttar Pradesh	365	100
	Power_Plus	Bihar	365	188
	SK-150	Uttar Pradesh	355	183
	SK-1510	Bihar	344	1//
		Uttar Pradesh	365	100
		Bihar	305	100
		Odisha	365	100
	SK-1520	Bihar	305	170
		Uttar Pradesh	341	100
	CK 1520	Uttar Pradesh	202	100
	SK-1530	Odisha	265	104
		Bihar	265	100
	CD 215	Uttar Pradesh	305	100
	SP 315	Bihar	202	100
		Udisha	252	102
	SP Breeze	Udisha	252	103
		Uttar Pradesh	333	102
	SP Breeze 2.0	Uttar Pradesh	240	101
	SP Inverter	Uttar Pradesh	349	100
	SP Inverter 100	Odisha	365	188

SP Inverter 200	Bihar	365	188
	Odisha	341	176
	Bihar	365	188
SP_Inverter100_12M	Odisha	365	188
	Uttar Pradesh	358	184
SP100	Bihar	336	173
	Odisha	347	179
	Uttar Pradesh	358	184
SP200	Bihar	341	176
	Odisha	336	176
CDEO	Uttar Pradesh	357	184
5850	Bihar	365	188
Crearly Co	Uttar Pradesh	346	178
Брагк Go	Bihar	365	188
	Uttar Pradesh	354	182
Spark Pro	Bihar	345	178
	Odisha	365	188
	Uttar Pradesh	365	188
Spark Pro Breeze	Bihar	348	179
	Odisha	355	183
	Bihar	365	188
Spark Pro Phantom	Odisha	350	180
Charle Dro Diug	Bihar	356	184
Spark Pro Plus	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
Iliala 2.0	Bihar	365	188
	Odisha	365	188
Iliala Broozo	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
	Assam	338	179
dlight S100	Bihar	352	181
	West Bengal	351	181
dlight S20	West Bengal	347	179

	dlight C220	Bihar	354	183	
	alight 5320	West Bengal	353	182	
	dlight M350+	West Bengal	350	179	
		Assam	350	180	
	Sunking pro2	Bihar	348	179	
		West Bengal	356	183	
	Cupling III C	Bihar	352	182	
		Assam	355	183	
	d.light S500	Assam	363	187	
	d.light S450	Assam	348	179	
		Chhattisgarh	360	185	
		Jharkhand	361	186	
	d.light ST100	Madhya Pradesh	356	183	
		Odisha	361	186	
		West Bengal	358	184	
		Chhattisgarh	356	183	
	d.light S100	Jharkhand	358	184	
		Odisha	322	166	
		West Bengal	362	186	
Measurement methods and procedures	Exact date of sale (i installation (in the cas clean energy products and recorded in Crea sold/installed in period will be used to calculat v. For products sold/inst equal to the total numb	n the case of se of solar hom is tracked by m dit Tracker. Fo v, the date of e total days of o stalled prior to po per of days in pe	solar li e system nonitorin r produ sale or i operation eriod v, eriod v.	ghts) an ms) for a g partne icts new nstallatio n in perio di,a,v will	nd all ers /ly on od be
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	Н
Unit	Hours/day
Description	Average operating hours of kerosene lamps in the baseline

TEMPLATE- Monitoring Report

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

Data / Parameter	LFR _{i,v}			
Unit	%			
Description	Lamp failure rate: Share of lamps of lamp type i in checked sample group gi, v not operational in period v			
Source of data	Monitoring partner, Credit Tracker			
Value(s) applied	Model	State	Year- 1	Year-2
	Magia TV	Uttar Pradesh	5.38%	6.45%
	Magic IV	Bihar	0.00%	0.00%
	Magia TV/ DOO	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%
		Uttar Pradesh	0.00%	0.00%
	Power_55	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%
	SV-150	Uttar Pradesh	2.46%	2.77%
	SK-150	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%
	JK-1JZU	Bihar	0.00%	0.00%

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% SP 315 Uttar Pradesh 0.00% 0.00% SP Breeze Uttar Pradesh 0.00% 0.00% SP Breeze Odisha 2.65% 3.17% SP Breeze Odisha 1.92% 2.88% Uttar Pradesh 3.04% 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% SP_Inverter100_12M Bihar 0.00% 0.00%
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% SP 315 Bihar 0.00% 0.00% SP 315 Bihar 0.00% 0.00% SP Breeze 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% SP_Inverter 200 Bihar 0.00% 0.00% SP_Inverter100_12M Bihar 0.00% 0.00%
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Bihar 0.00% 0.00% SP 315 Uttar Pradesh 0.00% 0.00% Bihar 0.00% 0.00% 0.00% Odisha 2.65% 3.17% SP Breeze Odisha 1.92% 2.88% Uttar Pradesh 2.04% 3.34% SP Breeze 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% SP_Inverter 100_12M Bihar 0.00% 0.00% Odisha 0.00% 0.00% 0.00%
$\begin{array}{c cccccc} & Uttar \mbox{ Pradesh} & 0.00\% & 0.00\% \\ \hline \mbox{Bihar} & 0.00\% & 0.00\% \\ \hline \mbox{Bihar} & 0.00\% & 0.00\% \\ \hline \mbox{Odisha} & 2.65\% & 3.17\% \\ \hline \mbox{Odisha} & 1.92\% & 2.88\% \\ \hline \mbox{Uttar Pradesh} & 2.04\% & 3.34\% \\ \hline \mbox{SP Breeze 2.0} & Uttar \mbox{Pradesh} & 3.94\% & 3.94\% \\ \hline \mbox{SP Inverter} & Uttar \mbox{Pradesh} & 3.23\% & 4.30\% \\ \hline \mbox{SP Inverter 100} & Odisha & 0.00\% & 0.00\% \\ \hline \mbox{SP Inverter 200} & \hline \mbox{Bihar} & 0.00\% & 0.00\% \\ \hline \mbox{SP_Inverter100_12M} & \hline \mbox{Bihar} & 0.00\% & 0.00\% \\ \hline \mbox{Odisha} & $
SP 315 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% SP_Inverter100_12M Bihar 0.00% 0.00%
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SP Breeze 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% SP_Inverter100_12M Bihar 0.00% 0.00%
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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%
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SP_Inverter100_12M Bihar 0.00% 0.00% Odisha 0.00% 0.00% 0.00%
SP_Inverter100_12M
Ouisila Ciccite Ciccite
Uttar Pradesh 2.00% 2.05%
SP100 Bihar 6.67% 8.00%
Odisha 2.44% 4.88%
Uttar Pradesh 1.81% 2.02%
SP200 Bihar 6.45% 6.45%
Odisha 3.28% 6.56%
Uttar Pradesh 2.10% 2.31%
Bihar 0.00% 0.00%
Uttar Pradesh 3.06% 5.10%
Bihar 0.00% 0.00%
Uttar Pradesh 2.58% 3.12%
Spark Pro Bihar 3.70% 5.56%
Odisha 0.00% 0.00%
Uttar Pradesh 0.00% 0.00%
Spark Pro Breeze Bihar 4.76% 4.76%
Odisha 2.23% 2.68%
Spark Bro Bhantom Bihar 0.00% 0.00%
Odisha 2.46% 4.10%
Bihar 1.87% 2.34%
Odisha 1.55% 2.48%
Spark Pro Uiala Odiaha 0.00% 0.00%
Spark Pro UjalaOdisha0.00%Spark SeriesUttar Pradesh1.81%2.19%
Spark Pro Ojala Odisha 0.00% Spark Series Uttar Pradesh 1.81% 2.19% Star 200 4L+F Uttar Pradesh 0.00% 0.00%
Spark Pro OjalaOdisha0.00%Spark SeriesUttar Pradesh1.81%Star 200 4L+FUttar Pradesh0.00%TurboUttar Pradesh0.00%
Spark Pro OjalaOdisha0.00%Spark SeriesUttar Pradesh1.81%2.19%Star 200 4L+FUttar Pradesh0.00%0.00%TurboUttar Pradesh0.00%0.00%Turbo 120Uttar Pradesh3.08%3.56%
Spark Pro Ojala 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%
Spark Pro Ojala Odisha 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%

	Odisha	0.00%	0.00%
Liele Dueses	Odisha	0.00%	0.00%
	Bihar	0.00%	0.00%
Cupyorter 1520	Odisha	5.56%	5.56%
Surverter 1530	Uttar Pradesh	0.00%	0.00%
Turbo Classic	Uttar Pradesh	0.00%	0.00%
Developt Co250	Bihar	5.19%	6.49%
Bareroot Gozou	West Bengal	3.73%	3.87%
	Assam	5.31%	7.08%
dlight S100	Bihar	2.97%	3.58%
	West Bengal	3.55%	3.76%
dlight S20	West Bengal	4.62%	4.96%
dlight \$220	Bihar	2.40%	2.90%
ulight 5520	West Bengal	3.27%	3.36%
dlight M350+	nt M350+ West Bengal		4.95%
	Assam	3.68%	4.09%
Sunking pro2	Bihar	4.35%	4.73%
	West Bengal	2.18%	2.58%
Supking HIS	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%
	Chhattisgarh	0.73%	1.46%
	Jharkhand	0.93%	1.00%
d.light ST100	Madhya Pradesh	2.16%	2.40%
	Odisha	0.66%	1.00%
	West Bengal	1.44%	1.88%
	Chhattisgarh	2.44%	2.44%
d light \$100	Jharkhand	1.02%	2.04%
a.light S100	Odisha	9.52%	11.90%
	West Bengal	0.85%	0.89%

Measurement methodsCME/PO have tracked the usage status of all solar lightingand proceduressystems from each quarter of the year with resultsrecorded in Credit Tracker.

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

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

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

	Dile	100.00	100.00
	ыnar	%	%
Magic TV	Odisha	100.00 %	100.00 %
P80		100.00	100.00
	Bihar	%	%
PHOENIX	Uttar	100.00	100.00
120	Pradesh	%	%
120	littar	92.61	92.61%
Pico	Pradesh	0/2.01	52.0170
	littar	02.63	80 70%
	Bradoch	92.05	09.7970
	Flauesh	01 40	20.060/
Power 80	Dihan	91.40	09.90%
	Binar	% 02.00	01 100/
		92.90	91.19%
	Udisha	%	044004
Power	51	94.35	94.10%
Lite	Bihar	%	100.00
	Uttar	100.00	100.00
	Pradesh	%	%
Power_5		100.00	100.00
5	Bihar	%	%
		90.36	90.44%
	Odisha	%	
Power_M	Uttar	100.00	100.00
ax	Pradesh	%	%
Power Pl		100.00	100.00
us	Bihar	%	%
us	Bihar Uttar	% 94.16	% 93.60%
us SK-150	Bihar Uttar Pradesh	% 94.16 %	% 93.60%
us SK-150	Bihar Uttar Pradesh	% 94.16 % 88.48	% 93.60% 88.58%
us SK-150	Bihar Uttar Pradesh Bihar	% 94.16 % 88.48 %	% 93.60% 88.58%
us SK-150	Bihar Uttar Pradesh Bihar Uttar	% 94.16 % 88.48 % 100.00	% 93.60% 88.58% 100.00
us SK-150	Bihar Uttar Pradesh Bihar Uttar Pradesh	% 94.16 % 88.48 % 100.00 %	% 93.60% 88.58% 100.00 %
us SK-150 SK-1510	Bihar Uttar Pradesh Bihar Uttar Pradesh	% 94.16 % 88.48 % 100.00 % 100.00	% 93.60% 88.58% 100.00 % 100.00
us SK-150 SK-1510	Bihar Uttar Pradesh Bihar Uttar Pradesh Bihar	% 94.16 % 88.48 % 100.00 % 100.00 %	% 93.60% 88.58% 100.00 % 100.00 %
us SK-150 SK-1510	Bihar Uttar Pradesh Bihar Uttar Pradesh Bihar	% 94.16 % 88.48 % 100.00 % 100.00 % 100.00 %	% 93.60% 88.58% 100.00 % 100.00 %
us SK-150 SK-1510	Bihar Uttar Pradesh Bihar Uttar Pradesh Bihar Odisha	% 94.16 % 88.48 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 %	% 93.60% 88.58% 100.00 % 100.00 % 100.00 %
us SK-150 SK-1510 SK-1520	Bihar Uttar Pradesh Bihar Uttar Pradesh Bihar Odisha	% 94.16 % 88.48 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 %	% 93.60% 88.58% 100.00 % 100.00 % 100.00 %
us SK-150 SK-1510 SK-1520	Bihar Uttar Pradesh Bihar Uttar Pradesh Bihar Odisha Bihar	% 94.16 % 88.48 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 %	% 93.60% 88.58% 100.00 % 100.00 % 100.00 %
us SK-150 SK-1510 SK-1520	Bihar Uttar Pradesh Bihar Uttar Pradesh Bihar Odisha Bihar Uttar	% 94.16 % 88.48 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 87.86	% 93.60% 88.58% 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 87.95%
us SK-150 SK-1510 SK-1520	Bihar Uttar Pradesh Bihar Uttar Pradesh Bihar Odisha Bihar Uttar Pradesh	% 94.16 % 88.48 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 %	% 93.60% 88.58% 100.00 % 100.00 % 100.00 % 87.95%
us SK-150 SK-1510 SK-1520	Bihar Uttar Pradesh Bihar Uttar Pradesh Bihar Odisha Bihar Uttar Pradesh Uttar	% 94.16 % 88.48 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 %	% 93.60% 88.58% 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 %
us SK-150 SK-1510 SK-1520	Bihar Uttar Pradesh Bihar Uttar Pradesh Bihar Odisha Bihar Uttar Pradesh Uttar Pradesh	% 94.16 % 88.48 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 %	% 93.60% 88.58% 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 %
us SK-150 SK-1510 SK-1520	Bihar Uttar Pradesh Bihar Uttar Pradesh Bihar Odisha Bihar Uttar Pradesh Uttar Pradesh	% 94.16 % 88.48 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 94.84	% 93.60% 88.58% 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 94.84%
us SK-150 SK-1510 SK-1520 SK-1530	Bihar Uttar Pradesh Bihar Uttar Pradesh Bihar Odisha Bihar Uttar Pradesh Uttar Pradesh Odisha	% 94.16 % 88.48 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 94.84 %	% 93.60% 88.58% 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 94.84%
us SK-150 SK-1510 SK-1520 SK-1530	Bihar Uttar Pradesh Bihar Uttar Pradesh Bihar Odisha Bihar Uttar Pradesh Uttar Pradesh Odisha	% 94.16 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00	% 93.60% 88.58% 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00
us SK-150 SK-1510 SK-1520 SK-1530	Bihar Uttar Pradesh Bihar Uttar Pradesh Bihar Odisha Bihar Uttar Pradesh Uttar Pradesh Odisha Bihar	% 94.16 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 %	% 93.60% 88.58% 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 %
us SK-150 SK-1510 SK-1520 SK-1530	Bihar Uttar Pradesh Bihar Uttar Pradesh Bihar Odisha Uttar Pradesh Uttar Pradesh Odisha Bihar Uttar	% 94.16 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00	% 93.60% 88.58% 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 %
us SK-150 SK-1510 SK-1520 SK-1530	Bihar Uttar Pradesh Bihar Uttar Pradesh Bihar Odisha Uttar Pradesh Uttar Pradesh Odisha Bihar Uttar Pradesh	% 94.16 % 88.48 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 %	% 93.60% 88.58% 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 %
us SK-150 SK-1510 SK-1520 SK-1530 SP 315	Bihar Uttar Pradesh Bihar Uttar Pradesh Bihar Odisha Bihar Uttar Pradesh Uttar Pradesh Odisha Bihar Uttar Pradesh	% 94.16 % 88.48 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 %	% 93.60% 88.58% 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 % 100.00 %

	Odisha	93.64 %	93.06%
		94.79	93.11%
SP	Odisha	%	
Breeze	Uttar Pradesh	95.50 %	93.48%
SD		01 32	91 40%
Breeze	Uttar Pradesh	%	91.4070
2.0 CD	litter	02 54	00.020/
Inverter	Pradesh	92.54 %	90.92%
SP		100.00	100.00
Inverter 100	Odisha	%	%
		100.00	100.00
SP	Bibar	0/2	0/2
Inverter	Dinal	07.00	
200		87.66	87.76%
	Udisha	%	
SP_Inver	Bihar	100.00 %	100.00 %
		100.00	100.00
214	Odisha	%	%
	Uttar	96.00	95 86%
	Pradesh	0/0	5510070
	Tudesti	07.26	QE 610/
SP100	Bihar	87.36 %	85.01%
		93.93	90.05%
	Odisha	%	
	Uttar	96.25	95.85%
	Pradesh	%	
60000		87.66	87.76%
SP200	Bihar	%	
		92.46	87.41%
	Odisha	0/0	0,111,0
	littar	95 / 0	95 150/2
	Dradach	0/2	95.1570
SP50	Flauesil	100.00	100.00
	Dile	100.00	100.00
	Binar	%0	%
	Uttar	93.01	89.72%
Spark Go	Pradesh	%	
		100.00	100.00
	Bihar	%	%
	Uttar	95.10	94.26%
	Pradesh	%	
Spark		91.69	88.86%
Pro	Bihar	%	
		100.00	100.00
	Odisha	%	%
	Uttar	100.00	100.00
Spark	Pradesh	%	%
Pro		90.22	90 22%
Breeze	Ribar	0/22	50.2270
	Dillar	70	

		94.17	93.45%	
	Odisha	%		
Spark		100.00	100.00	
Брагк	Bihar	%	%	
Pro		93.83	91.15%	
Phantom	Odisha	0/2	5112070	
	Ouisila	70	04.040/	
- ·		94.89	94.04%	
Spark	Bihar	%		
Pro Plus		96.20	94.81%	
	Odisha	%		
Spark		100.00	100.00	
Pro Iliala	Odisha	0/2	0/2	
Spark	Uttar	96.25	95.64%	
Series	Pradesh	%		
Star 200	Uttar	100.00	100.00	
4L+F	Pradesh	%	%	
	Uttar	100.00	100.00	
Turbo	Pradesh	0/0	0/0	
Turbo	littar	01 11	03 650/	
100	Duadaala	94.44	95.05%	
120	Pradesh	%	0.0.450	
Turbo	Uttar	93.80	93.43%	
240	Pradesh	%		
	Uttar	92.16	89.94%	
Turbo 80	Pradesh	%		
		100.00	100.00	
	Bibar	0/2	0/2	
Ujala 2.0	Dinai	100.00	100.00	
		100.00	100.00	
	Odisna	%	%	
		100.00	100.00	
Ujala	Odisha	%	%	
Breeze		100.00	100.00	
	Bihar	%	%	
		89.05	89.05%	
Sunverte	Odisha	%		
r 1530	littar	100.00	100.00	
1 1 3 5 0	Dradach	0/2	0/2	
Turkse	FIGUESI	100.00	100.00	
	ottar	100.00	100.00	
Classic	Pradesh	%	%	
		89.49	87.60%	
Barefoot	Bihar	%		
Go250	West	93.45	93.21%	
	Bengal	%		
		89.22	87.07%	
	Assam	0/0	0,10,70	
dlight	///////////////////////////////////////	01 55	03 6/10/-	
CIOC	Dikan	94.55	93.04%	
5100	Binar	%		
	West	93.89	93.71%	
	Bengal	%		
dlight	West	92.35	92.19%	
S20	Bengal	%		
dlight	5	95 38	94 59%	
angit	Dihaw	0/-	51.5570	
5320	Binar	-//)		
		West	94.17	94.31%
------------------------------------	-------------	------------------	-------------------------	---------------------
		Bengal	%	
	dlight	West	94.41	92.18%
	M350+	Bengal	%	
			93.55	92.97%
		Assam	%	
	Sunking		91.54	90.95%
	pro2	Bihar	%	
		West	95.68	95.31%
		Bengal	%	
		Dile	95.12	93.43%
	Sunking	Bihar	%	04.24.0/
	HLS		95.52	94.31%
	d liebt	Assam	%	00.240/
	a.light	Accom	98.28	98.24%
	S500	Assam	% 01.72	00.100/
	a.light	Accom	91.72	90.18%
	5450	Chhattic	% 07.40	06 190/
		Cillatus	97.49	90.10%
		lbarkba	⁻⁷⁰ 07.05	97.07%
		nd	97.0J 0/2	97.0770
	d light	Madhya	94 91	94 51%
	ST100	Pradesh	0/2 0/2	J4.J170
	51100	Tradesit	97 39	96.63%
		Odisha	%	50.0570
		West	96.18	95.46%
		Bengal	%	
		Chhattis	93.93	93.93%
		garh	%	
		Jharkha	96.61	94.57%
	d.light	nd	%	
	S100		83.44	80.20%
		Odisha	%	
		West	97.41	97.31%
		Bengal	%	
Measurement methods and procedures	The valu	e is calo	culated	using the
	recorded v	value for Lf	=R _{i,v} –	
	CF i,	$v_{,LFR} = 1 -$	$(LFR_{i,v} +$	$z * \sqrt{LFRi,v}$
	* (1	- LFRi,v))		
	ni,v,total			
Monitoring frequency	Annual			
OA/OC procedures	The statist	ical error	is includ	ded in this
	narameter	(confidenc	e level C	0%) when
	90/10 pred	cision is n	nt met	But in this
	monitoring	noriod 00	/10 proci	sion is mot
	nonicoring	penou, 90,		sion is met.
Purpose of data	Calculation	of baseline	e emissio	ons
Additional comment	-			

Data / Parameter	n, _{i,v,total}			
Unit	Lamps			
Description	Total number of lamps checked for which a valid result was obtained.			
Source of data	Monitoring partner, Credit Tracker			
Value(s) applied	Model	State	Year- 1	Year- 2
		Uttar Pradesh	31	31
	Magic TV	Bihar	13	13
		Odisha	1	1
	Magic IV P80	Bihar	4	4
	PHOENIX 120	Uttar Pradesh	2	2
	Pico	Uttar Pradesh	30	30
		Uttar Pradesh	62	59
	Power 80	Bihar	31	32
		Odisha	30	33
	Power Lite	Bihar	34	39
		Uttar Pradesh	4	4
	Power_55	Bihar	4	4
		Odisha	29	30
	Power_Max	Uttar Pradesh	11	11
	Power_Plus	Bihar	1	1
	SK-150	Uttar Pradesh	35	34
	5K-150	Bihar	29	30
	SK-1510	Uttar Pradesh	2	2
	5K-1510	Bihar	11	11
		Odisha	9	9
	SK-1520	Bihar	10	10
		Uttar Pradesh	31	32
		Uttar Pradesh	21	21
	SK-1530	Odisha	31	31
		Bihar	26	26
		Uttar Pradesh	22	23
	SP 315	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

SP Invertor100 12M	Bihar	1	1
	Odisha	2	2
	Uttar Pradesh	81	77
SP100	Bihar	29	30
	Odisha	30	30
	Uttar Pradesh	79	73
SP200	Bihar	29	30
	Odisha	29	28
CDEO	Uttar Pradesh	59	58
5P50	Bihar	10	10
Spark Co	Uttar Pradesh	32	30
Spark Gu	Bihar	20	20
	Uttar Pradesh	78	73
Spark Pro	Bihar	28	28
	Odisha	11	11
	Uttar Pradesh	29	29
Spark Pro Breeze	Bihar	30	30
	Odisha	28	29
Charle Dro Dhantom	Bihar	24	24
Spark Pro Phantom	Odisha	29	29
Crearly Dres Dive	Bihar	29	29
Spark Pro Plus	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
	Bihar	15	15
	Odisha	2	2
Iliala Broozo	Odisha	1	1
	Bihar	1	1
Supvortor 1520	Odisha	30	30
	Uttar Pradesh	5	5
Turbo Classic	Uttar Pradesh	4	4
Barafact Co250	Bihar	29	29
Dareituut G0250	West Bengal	75	73
	Assam	28	32
dlight S100	Bihar	78	74
	West Bengal	87	94
dlight S20	West Bengal	80	96
dlight C220	Bihar	79	74
ulight 5320	West Bengal	80	99

		Mast Depas	82	95
	alight M350+		77	76
	Sunking pro2	Assam	//	10
		Binar Moot Bongol	78	40
			50	57
	Sunking HLS	Binar	48	55
	d light SE00	Assam	38	14
		Assam	20	28
	a.light 5450	Assam	38	43
			38	43
		Madhya	J0 ⊿1	11
	d.light ST100	Pradesh	41	41
		Odisha	29	29
		West Bengal	42	43
		Chhattisgarh	30	30
		Jharkhand	30	29
	d.light S100	Odisha	29	28
		West Bengal	46	45
				n 4.0. Th
	total number of solar li be operational are parameter.	ghting systems noted down a	which a nd use	n 4.0. Th re found t d for th
Monitoring frequency	total number of solar li be operational are parameter. Annual	ghting systems noted down a	which a nd use	n 4.0. Th re found t d for th
Monitoring frequency QA/QC procedures	total number of solar li be operational are parameter. Annual CME/PO randomly households contacted usage status for each la <i>p</i> . This data is reco methods are used.	ghting systems noted down a and represe and reached fo amp type <i>i</i> in the rded in Credit	which a nd used ntatively r monit monitor Tracker	n 4.0. Th re found t d for th v tracke oring lam ring period
Monitoring frequency QA/QC procedures Purpose of data	total number of solar li be operational are parameter. Annual CME/PO randomly households contacted usage status for each la p. This data is reco methods are used. Calculation of baseline	ghting systems noted down a and represen and reached fo amp type <i>i</i> in the rded in Credit emissions	which a nd used ntatively r monitor Tracker	n 4.0. Th re found t d for th oring lam ring period

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 n 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	Н
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 gi, 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 $LFR_{i,v}$ –					
	$CF_{i,v,LFR} = 1 - (LFR_{i,v} + z * \sqrt{LFRi,v * (1 - LFRi,v)})$ ni,v,total					
Monitoring frequency	Annual					
QA/QC procedures	The statistical error is included in this parameter (confidence level 90%) when 90/10 precision is not met.					
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

Data/Parameter	Value obtained in this			Value obtained last			
	monitor	oring period			monitor	ing period	
	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
N _{p,y}		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
	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%
U _{p,y}		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%
	VPA4	Smart KA	0.0036				
	VPA7	Smart KA	0.0034				
		Smart CG	0.0034				
		Smart MP	0.0033				
P _{p,y}		Smart TN	0.0032		-		
	VPA8	Smart KA	0.0035				
	VPA17	Smart KA	0.0032				
	VPA18	Jumbo KA	0.0030				
		Smart KA	0.0029				
	VPA4	56,342 sola	ir lamps			10 704 colo	r
N _{i,a} /N _{i,j}	VPA7	126,504 so	lar		VFA4	LJ,/J4 SOld	
		lamps				ingnung syst	em

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

	VPA8	35,349 solar lamps	VPA7	46,822 solar			
	VPA17	0		lighting system			
	VPA18	0	VPA8	11,671 solar			
	<u> </u>			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	-				
	VPA4	44,620	VPA4	13,484			
	VPA7	52,851	VPA7	16,360			
	VPA8	41,172	VPA8	11,066			
	VPA17	68,813	VPA17	17,199			
SDG 13	VPA18	66,392	VPA18	16,704			
	ICS			_			
	VPA4- 29,937						
	VPA7- 28,495						
	VPA8- 23,337						
	VPA17-26,921						
SDG 1	VPA18-26,080						
5001	SLS						
	VPA4- 19,794						
	VPA7- 46,822						
	VPA8- 11	1,671					
	VPA17-0						
	VPA18-0						
	ICS						
	VPA4- 64%						
SDG 3	VPA7- 66	5%	_				
500 5	VPA8- 68%						
	VPA17-86%						
	VPA18-83%						
	ICS						
SDG 5	VPA4- 64	1%	-				
	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 /	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

Data/Paramete r	Value ol	btained in th	is monito	oring	Value ol	Value obtained last			
•		Smart 1/A	10.062				10.062		
	VPAJ		19,903		VPAJ	Siliait KA	19,905		
	VPA11	Smart KA	34		VPA11	Smart KA	34		
		Jumbo KA	555			Jumbo KA	555		
		Smart MH	7,353			Smart MH	7,353		
N _{p,y}		Jumbo KL	4,950			Jumbo KL	4,950		
		PowerGram	1,328			Powergram	1,328		
		TN				TN			
	VPA13	Smart KA	15,000		VPA13	Smart KA	15,000		
		Jumbo KA	12,000			Jumbo KA	12,000		
			Year1	Year2			1		
	VPA5	Smart KA	58%	56%	VPA5	Smart KA	72%		
	VPΔ11	Smart KA	74%	68%	VPA11	Smart KA	82%		
	VIAII		55%	53%		Jumbo KA	69%		
		Smart MU	5570	5570		Smart MH	70%		
U _{p,y}			00%	61%		Jumbo KL	70%		
		Jumbo KL	66%	62%		PowerGram	71%		
		PowerGram	66%	60%		TN			
		TN			VPA13	Smart KA	81%		
	VPA13	Smart KA	76%	70%		Jumbo KA	83%		
		Jumbo KA	76%	71%		JUIIDO KA	0570		
	VPA5	Smart KA	0.0036]					
	VPA11	Smart KA	0.0034						
		Jumbo KA	0.0034						
		Smart MH	0.0033						
P _{p,y}		Jumbo KL	0.0032		_7				
		PowerGram	0.0035						
		TN							
	VPA13	Smart KA	0.0031						
		Jumbo KA	0.0026						
			<u>.</u>		VPA5	81,045 solar			
NL /NL		00 000 1				- /			

VPAs with monitoring period 27/06/2020 to 31/12/2021

 $^{\rm 7}$ This is due to change in methodology from AMS II.G to TPDDTEC

	VPA11 242,588 solar	VPA7 242,588 solar				
	lamps	lighting system				
	VPA13 138,762 solar	VPA13 143,718 solar				
	lighting systems	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				
Ni,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	-				
	VPA5 68,446	VPA5 17,818				
	VPA11 59,473	VPA11 27,833				
SDG 13	VPA13 152,786	VPA13 32,077				
	ICS					
	VPA5- 19,963					
	VPA11- 19,734					
	VPA13- 27,000					
SDG I	SLS	-				
	VPA5- 81,045					
	VPA11- 242,588					
	VPA13- 138,762					
	ICS					
	VPA5- 62%					
5DG 3	VPA11- 64%	-				
	VPA13- 73%					
	ICS					
	VPA5- 62%					
300 3	VPA11- 64%	-				
	VPA13-73%					
	ICS					
	VPA5- 11,013					
	VPA11- 9,005					
	VPA13-19,809					
SDG /	SLS					
	VPA5- 66,137					
	VPA11- 183,085					
	VPA13-132,324					
SDG 8	VPA5- 93	-				

VPA11- 48 VPA13- 75

D.4. Implementation of sampling plan

>>

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, VPA17 8 and VPA18 9 -

- 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

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	Vintage	Sales	Fraction	Samples	Fraction
		Requireme	Period	based	of Each	Monitore	of Each
		nt		on	Vintage	d for	Vintage
				correspo	in the	Each	in the
				nding	Sales	Vintage	Monitore
				vintage	Populatio		d
					n		Samples
			0-1				
			(01/01/20				
			21 to	0	0%	0	0%
			31/12/20				
			21)				
			1-2				
Spark	Uttar	86	(01/01/20				
Series	Pradesh	00	20 to	0	0%	0	0%
			31/12/20				
			20)				
			2-3				
			(01/01/20	0	0.07	0	00/
			19 to	U	U%0	U	0%
			31/12/20				

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

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

 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.
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 –

Parameter	Monitoring	CEPs added	Previous	Validity of	New
	Frequency	during this	monitoring	Previous	Monitoring
		МР	dates	Monitoring	for this MP
		(01/01/2021		results till	
		to			
		31/12/2021)			
Usage	Annual	No	16/01/2021	31/12/2021	Yes
Survey			to		
			15/02/2021		
Project	Biennial	No	-	-	Yes
КРТ					
Solar	Annual	No	15/01/2021	31/12/2021	Yes
Lighting			to		
System			20/02/2021		

1. <u>VPA4 GSID 11476</u>

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.

Paramet	Monitori	CEPs added	CEPs added	Previous	Validity of	New
er	ng	during this	during this	monitorin	Previous	Monitori
	Frequenc	МР	МР	g dates	Monitorin	ng for
	У	(27/06/20	(27/06/20		g results	this MP
		20 to	21 to		till	
		26/06/202	31/12/202			
		1)	1)			
Usage	Annual	No	No	28/06/20	26/12/20	Yes
Survey				20 to	20	
				27/07/20		
				20		
Project	Biennial	No	No	-	-	Yes
KPT						
Solar	Annual	No	No	28/06/20	26/12/20	Yes
Lighting				20 to	20	
System				15/07/20		
				20		

2. <u>VPA5 GSID 11505</u>

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. <u>VPA7 GSID 11477</u>

Parameter	Monitoring	CEPs added	Previous	Validity of	New
	Frequency	during this	monitoring	Previous	Monitoring
		МР	dates	Monitoring	for this MP
		(01/01/2021		results till	
		to			
		31/12/2021)			
Usage	Annual	No	06/01/2021	31/12/2021	Yes
Survey			to		
			24/02/2021		
Project	Biennial	No	-	-	Yes
KPT					
Solar	Annual	No	07/01/2021	31/12/2021	Yes
Lighting			to		
System			13/02/2021		

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

Farameter Monitoring	CEPs added	Previous	Validity of	New
Frequency	during this	monitoring	Previous	Monitoring
	MP	dates	Monitoring	for this MP
	(01/01/2021		results till	

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

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. <u>VPA11 GSID 11481</u>

Paramet	Monitori	CEPs added	CEPs added	Previous	Validity of	New
er	ng	during this	during this	monitorin	Previous	Monitori
	Frequenc	МР	МР	g dates	Monitorin	ng for
	У	(27/06/20	(27/06/20		g results	this MP
		20 to	21 to		till	
		26/06/202	31/12/202			
		1)	1)			
Usage	Annual	No	No	04/07/20	26/12/20	Yes
Survey				20 to	20	
				25/07/20		
				20		

Project	Biennial	No	No	-	-	Yes
КРТ						
Solar	Annual	No	No	04/07/20	26/12/20	Yes
Lighting				20 to	20	
System				25/07/20		
				20		

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.

Technolog	Monitori	CEPs added	CEPs	Previous	Validity of	New
У	ng	during this	added	monitorin	Previous	Monitor
	Frequen	МР	during	g dates	Monitorin	ing for
	су	(27/06/202	this MP		g results	this MP
		0 to	(27/06/2		till	
		26/06/2021	021 to			
)	31/12/20			
			21)			
Improved	Annual	No		27/06/202	26/12/202	Yes
cookstove				0 to	0	
S				09/07/202		
				0		
Project	Biennial	No	No	-	-	Yes
KPT						

6. <u>VPA13 GSID 11483</u>

Solar	Annual	No	27/06/202	26/12/202	Yes
Lighting			0 to	0	
Systems			09/07/202		
			0		

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. <u>VPA17 GSID 11451</u>

Technology	Monitorin	CEPs added	Previous	Validity of	New
	g	during the MP	Monitorin	Previous	Monitoring
	Frequenc	(27/06/2020	g Dates	Monitoring	for this MP
	У	to		results till	
		31/12/2020)			
Improved	Annual	No	04/01/202	31/12/2021	Yes
cookstoves			1 to		
			14/01/202		
			1		
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

Technolo	Monitoring	CEPs added	Previous	Validity of	New
gy	Frequency	during the	Monitoring	Previous	Monitoring
		МР	Dates	Monitoring	for this MP
		(27/06/202		results till	
		0 to			
		31/12/2020			
)			
Improved	Annual	No	04/01/202	31/12/2021	Yes
cookstov			1 to		
es			14/01/202		
			1		
Project	Biennial	No	-	31/12/2021	Yes
КРТ					

8. VPA18 GSID 11486

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. <u>VPA4 GSID 11476</u>

Improved Cookstoves (SKDRDP)

S.No	Parameter	Sampling approach	Sample size
1	Usage rate in project	Simple random sampling for	127
	scenario p during year y	proportion-based parameter	
	(U _{p,y})		
2	Quantity of fuel that is	Carry out KPTs- Simple	90
	consumed in project	random sampling for mean	
	scenario p during year y	based parameter	
	(P _{p,y})		

Solar Lighting System (SKDRDP)

S.		Sampling		
No.	Parameter	approach	Sample size	Comments
1	Total number of	Simple random	For e.g.:	As per guidance given in
	lamps checked	sampling for		para 13 and 14, page 7
	for which a	proportion-	As per	and 8 of Standard for
	valid result was	based	sample size	Sampling and surveys for
	obtained	parameter	calculation,	CDM project activities and
			sample size	programme of activities
			requirement	version 9.0, 30 samples
			for:	are chosen randomly and
			KA (2013)-140	separately from each
			KA (2014)-113	state. For e.g. if total
			Actual	sample size is less than
			monitored	30, then minimum 30
			samples for:	samples are selected. For
			KA (2013)-155	states, the total sale is
			KA (2014)-125	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 p	recision does
		not pass/m	eets. Detailed
		sample size	e for all other
		states sand	calculation is
		provided	in Emission
		reduction	calculation
		sheet.	

2. <u>VPA5 GSID 11505</u>

Improved Cookstoves (SKDRDP)

S.No	Parameter	Sampling approach	Sample size
1	Usage rate in project	Simple random sampling	State Y-1 Y-2
	scenario p during year	for proportion-based	
	y (U _{p,y})	parameter	KA 125 122
2	Quantity of fuel that is	Carry out KPTs- Simple	90
	consumed in project	random sampling for mean	
	scenario p during year	based parameter	
	y (P _{p,y})		

Solar Lighting System (SKDRDP, ESAF, Muthoot, Sarala)

S.		Sampling			
No.	Parameter	approach	Sample size	Comments	
1	Total number of	Simple random	For e.g.:	As per guidance given in	
	lamps checked	sampling for		para 13 and 14, page 7	
	for which a	proportion-	As per	and 8 of Standard for	
	valid result was	based	sample size	Sampling and surveys for	
	obtained	parameter	calculation,	CDM project activities and	
			sample size	programme of activities	
			requirement	version 9.0, 30 samples	
			for:	are chosen randomly and	
			KA (2016)-64	separately from each	
			GJ (2017)-65	state. For e.g. if total	
			UP (2017)-01	sample size is less than	

	30, then minimum 30
Actual	samples are selected. For
monitored	states like UP (2017), the
samples for:	total sale is less than 30,
KA (2016)-85	all units are sampled.
GJ (2017)-65	Further, for some of the
UP (2017)-01	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 sand calculation is
	provided in Emission
	reduction calculation
	sheet.

3. VPA7 GSID 11477

Improved Cookstoves (SKDRDP)

S.No	Parameter	Sampling approach	Sample size
1	Usage rate in project	Simple random sampling for	State Samples
	scenario p during year y	proportion-based	1/4 120
	(U _{p,y})	parameter	KA 130
2	Quantity of fuel that is	Carry out KPTs- Simple	90
	consumed in project	random sampling for mean	
	scenario p during year y	based parameter	
	(P _{p,y})		

Improved Cookstoves (ESAF)

S.No	Parameter	Sampling approach	Sample size
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1	Usage rate in project	Simple random sampling for	State	Samples
	scenario p during year y	proportion-based	66	101
	(U _{p,y})	parameter	CG	131
			MP	122
			TN	131
2	Quantity of fuel that is	Carry out KPTs- Simple	90 for (each state
	consumed in project	random sampling for mean		
	scenario p during year y	based parameter		
	(P _{p,y})			

Solar Lighting System (SKDRDP and Bandhan)

S.		Sampling		
No.	Parameter	approach	Sample size	Comments
1	Total number of	Simple random	For e.g.:	As per guidance given in
	lamps checked	sampling for		para 13 and 14, page 7
	for which a	proportion-	As per	and 8 of Standard for
	valid result was	based	sample size	Sampling and surveys for
	obtained	parameter	calculation,	CDM project activities and
			sample size	programme of activities
			requirement	version 9.0, 30 samples
			for:	are chosen randomly and
				separately from each
			JK (2019) – 26	state. For e.g. if total
			WB (2018) - 7	sample size is less than 30
			TR (2018) - 42	like JK (2019), then
				minimum 30 samples are
			Actual	selected. For states like
			monitored	WB (2018), the total sale
			samples for:	is less than 30, all units
				are sampled. Further, for
			JK (2019) – 53	some of the states TR
			WB (2018) - 8 (2018), the sample size	
			TR (2018) - 58	more than 30 therefore
				the required sample size is
				monitored. Oversampling
				is done for monitoring to

		account for	situation if the
		required p	precision does
		not pass/m	neets. Detailed
		sample size	e for all other
		states sand	l calculation is
		provided	in Emission
		reduction	calculation
		sheet.	

4. <u>VPA8 GSID 11478</u>

Improved Cookstoves (SKDRDP)

S.No	Parameter	Sampling approach	Sample size
1	Usage rate in project	Simple random sampling for	123
	scenario p during year y	proportion-based parameter	
	(U _{p,y})		
2	Quantity of fuel that is	Carry out KPTs- Simple	90
	consumed in project	random sampling for mean	
	scenario p during year y	based parameter	
	(P _{p,y})		

Solar Lighting System (SKDRDP)

S.		Sampling		
No.	Parameter	approach	Sample size	Comments
1	Total number of	Simple random	For e.g.:	As per guidance given in
	lamps checked	sampling for		para 13 and 14, page 7
	for which a	proportion-	As per	and 8 of Standard for
	valid result was	based	sample size	Sampling and surveys for
	obtained	parameter	calculation,	CDM project activities and
			sample size	programme of activities
			requirement	version 9.0, 30 samples
			for:	are chosen randomly and
			KA (2017)-67	separately from each
			KA (2018)-55	state. For e.g. if total

	sample size is less than
	30, then minimum 30
Actual	samples are selected. For
monitored	states, the total sale is
samples for:	less than 30, all units are
	sampled. Further, for
KA (2017)-90	some of the states KA
KA (2018)-77	(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 sand calculation is
	provided in Emission
	reduction calculation
	sheet.

5. <u>VPA11 GSID 11481</u>

Improved Cookstoves(ESAF)

S.No	Parameter	Sampling approach	Sample size		
1	Usage rate in project	Simple random sampling	State	Y-1	Y-2
	scenario p during year	for proportion-based		–	
	$v (U_{nv})$	parameter	Jumbo	115	125
	/ (~p/y/	P	KA		
			Jumbo 3	139	165
			KL		
			Smart 3	155	173
			MH		
			Smart 3	34	34
			KA		
			PowerG 2	128	158
			TN		

2	Quantity of fuel that is	Carry out KPTs- Simple	90 for each model state
	consumed in project	random sampling for	combination
	scenario p during year	mean based parameter	
	у (Р _{р,у})		

Solar Lighting System (Muthoot)

S.		Sampling		
No.	Parameter	approach	Sample size	Comments
1	Total number of	Simple random	For e.g.:	As per guidance given in
	lamps checked	sampling for		para 13 and 14, page 7
	for which a	proportion-	As per	and 8 of Standard for
	valid result was	based	sample size	Sampling and surveys for
	obtained	parameter	calculation,	CDM project activities and
			sample size	programme of activities
			requirement	version 9.0, 30 samples
			for:	are chosen randomly and
				separately from each
			OD - 12	model per state. For e.g. if
			KA - 99	total sample size is less
				than 30, then minimum 30
			Actual	samples are selected. For
			monitored	states, the total sale is
			samples for:	less than 30, all units are
				sampled. Further, for
			OD - 15	some of the states KA
			KA - 113	(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 sand calculation is

		provided	in	Emission
		reduction		calculation
		sheet.		

6. <u>VPA13 GSID 11483</u>

Improved Cookstoves (SKDRDP)

S.No	Parameter	Sampling approach Sample size	
1	Usage rate in project	Simple random sampling	State Y-1 Y-2
	scenario p during year	for proportion-based	
	$v (U_{n,v})$	parameter	Jumbo KA 106 110
	y (Op/y)	parameter	Smart KA 125 121
2	Quantity of fuel that is	Carry out KPTs- Simple	90 for each model state
	consumed in project	random sampling for	combination
	scenario p during year	mean based parameter	
	y (P _{p,y})		

Solar Lighting System (Sarala, Simpa and Arohan)

S.		Sampling		
No.	Parameter	approach	Sample size	Comments
1	Total number of	Simple random	For e.g.:	As per guidance given in
	lamps checked	sampling for		para 13 and 14, page 7
	for which a	proportion-	As per	and 8 of Standard for
	valid result was	based	sample size	Sampling and surveys for
	obtained	parameter	calculation,	CDM project activities and
			sample size	programme of activities
			requirement	version 9.0, 30 samples
			for:	are chosen randomly and
			Sarala d.light	separately from each
			M350+ (WB):	model per state. For e.g.
			109	30 samples are chosen
				randomly for monitoring
			Arohan d.light	for Arohan d.light S100
			S100 (JK): 23	(JK). For some of the
				models like Simpa SP
				Inverter 100 (OD), the

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

7. VPA17 GSID 11451

Improved Cookstoves (SKDRDP)

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

8. VPA18 GSID 11486

Improved Cookstoves (SKDRDP)

S.No	Parameter	Sampling approach	Sample size
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1	Usage rate in project	Simple random sampling	State Samples
	scenario p during year y (U _{p,y})	for proportion-based parameter	Jumbo 100 KA Smart 80
			КА
2	Quantity of fuel that is	Carry out KPTs- Simple	Jumbo KA-90
	consumed in project	random sampling for mean	Smart KA-80 ¹⁰
	scenario p during year y	based parameter	
	(P _{p,y})		

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

Where:

Σb,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 t CO_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 tCO₂e

The above example is sample calculation for one of the Partner-Model-State combinations for one VPA. The baseline emissions for Improved cookstoves included in the 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:

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

Gold Standard Climate Security and Sustainable Development

Parameter	Uni	t	Value	
ERy	tCO ₂ e		Emission reductions in year y	
N _{i,j}	Number of	project	Number of project lamps distributed to end	
BE _{y,i}	tCO ₂ e		Baseline emissions per project lamp in	
PE _{y,i}	tCO ₂ e		Project emissions per project lamp in year	
OF _{y,i,j}	%		Percentage of project lamps distributed to end users that are operating and in service in year <i>y</i> , for each lamp type <i>i</i> and charging method <i>j</i> . 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)
GFy	-	 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)
DBy	-	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)

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)		
0	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:

 $DV = 0.03 \times 3.5 \times 365 \times 2.4 / 1000 \times 1 \times 1$

= 0.092 tCO₂e

 $\mathsf{BE}_{\mathsf{y}} \quad = \quad \mathsf{DV} \ge \mathsf{GF}_{\mathsf{y}} \ge \mathsf{DB}\mathsf{y}$

 $= 0.092 \times 1 \times 1 = 0.092 \text{ tCO}_2\text{e}$

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

- = 4 * (0.092*78/365 0) * 68%
- = 0.0786 * 68%
- = 0.0534 tCO₂e

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.

<u>AMS I.A v14.0</u>

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

Paramet	Unit	Туре	Value
er			
BE_v	tCO ₂	Calculate	Emissions generated in the absence of the
		d	project activity in period v by all lamps
$BE_{i,v}$	tCO ₂	Calculate	Emissions generated in the absence of the
		d	project activity in period v by all lamps of
			type <i>i</i>

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

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

Paramet	Unit	Туре	Value
er			
$BE_{i,v}$	tCO ₂	Calculate	Emissions generated in the absence of the
		d	project activity in period v by all lamps of
			type <i>i</i>
N _{i,a}	-	Monitore	The total number of solar lamps of type <i>i</i>
		d	deployed in period a
$d_{i,a,v}$	Days	Monitore	Average number of days lamps of type i
		d/calcula	that have been deployed in period a were
		ted	operating in period v

li	Lumen	Monitore	Nominal lumen output of solar lamps of the
		d (once	type <i>I</i> deployed as part of the project
		per lamp	activity
		type)	
h	Hours/da	Fixed	Average number of hours solar lamps are
	У		used per day
LE _{ker}	Lumen/	Fixed	The specific light output of kerosene when
	W		burnt in a kerosene lantern
EF _{ker}	tCO ₂ /GJ	Fixed	The specific CO ₂ -emissions of kerosene
$CF_{i,v,LFR}$	-	Monitore	This factor corrects the total number of
		d/Calcula	lamps of type <i>i</i> by the share of these lamps
		ted	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

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

Paramet	Unit	Туре	Value	
er				
$CF_{i,v,LFR}$	%	Calculate	This factor corrects the total number of	
		d	lamps of type <i>i</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}	%	Monitore	Share of lamps of lamp type <i>i</i> in checked	
		d	sample group $g_{i,v}$ not operational in period	
			<i>V</i> .	
Ζ	-	Given	Standard normal for a confidence level of	
			90%	
n _{i,v,total}		Monitore	Total number of lamps checked for which a	
	-	d	valid result was obtained.	

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

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

BEv = (27,406*187)*140.54*3.5*(1/0.13)*0.0719*10⁻⁶*3.6*98.27%
= 4,936.31 tCO₂

The above example is sample calculation for one of the Model-State combinations for the VPA. The baseline emissions for solar lighting systems included in 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

>>

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	BSAProject	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}

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%

ICS

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	HHTSProject	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	ACSProject	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		ACSBaseline	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

>>

Leakage for all VPAs for this monitoring period = 0

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

SD	SDG Impact	Baseline	Project	Net
G		estimate	estimate	benefit

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)	F 0 5	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)	F 0 5	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	9 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 fue 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)	F O	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 13-19,809 VPA 17-23,152 VPA 18-21,648	VPA 11-9,005 VPA 13-19,809 VPA 17-23,152 VPA 18-21,648
7	Number of 0 beneficiaries (SLS)	VPA 4-14,375 VPA 5-66,137 VPA 7-35,522 VPA 8-9,421 VPA 11-183,085 VPA 13-132,324 VPA17-0 VPA18-0	VPA 4-14,375 VPA 5-66,137 VPA 7-35,522 VPA 8-9,421 VPA 11-183,085 VPA 13-132,324 VPA17-0 VPA18-0
8	Quantitative Employment and 0 income generation	VPA 4- 30 VPA 5- 93 VPA 7- 60 VPA 8- 30 VPA 11- 48 VPA 13- 75 VPA 17- 30 VPA 18- 30	VPA 4- 30 VPA 5- 93 VPA 7- 60 VPA 8- 30 VPA 11- 48 VPA 13- 75 VPA 17- 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
10	VPA 8- 72,137	VPA 8- 41,172
15	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.

	VPA 4-29,937	VPA 4-29,937
	VPA 5-19,963	VPA 5-19,963
	VPA 7-28,495	VPA 7-28,495
1 (100)	VPA 8-23,337	VPA 8-23,337
I(ICS)	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
	VPA 4-19,794	VPA 4-19,794
	VPA 5-81,045	VPA 5-81,045
	VPA 7-46,822	VPA 7-46,822
1(S S)	VPA 8-11,671	VPA 8-11,671
1 (313)	VPA 11-242,588	VPA 11-242,588
	VPA 13-200,000	VPA 13-138,762
	VPA17-0	VPA17-0
	VPA18-0	VPA18-0
	VPA 4-100%	VPA 4-64%
	VPA 5-100%	VPA 5-61%
	VPA 7-100%	VPA 7-67%
3	VPA 8-100%	VPA 8-68%
5	VPA 11-100%	VPA 11-64%
	VPA 13-100%	VPA 13-73%
	VPA17-100%	VPA 17- 86%
	VPA18-100%	VPA 18 - 83%
	VPA 4-100%	VPA 4-64%
	VPA 5-100%	VPA 5-61%
	VPA 7-100%	VPA 7-67%
5	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%
	VPA 4-26,943	VPA 4-17,127
	VPA 5-17,697	VPA 5-11,013
	VPA 7-25,646	VPA 7-17,036
7 (ICS)	VPA 8-21,004	VPA 8-14,228
(100)	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
	VPA 4-19,794	VPA 4-14,375
7 (SLS)	VPA 5-81,045	VPA 5-66,13/
	VPA /-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
	VPA 4- 20	VPA 4- 30
	VPA 5- 20	VPA 5- 93
	VPA 7- 20	VPA 7- 60
0	VPA 8- 20	VPA 8- 30
õ	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 CO_2e)" 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 CO_2e)" 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 CO_2e)" 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 CO_2e)" 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 CO_2e)" 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 CO_2e)" 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 CO_2e)" of this VPA, please refer to the emission reduction calculation sheet.

SECTION F. SAFEGUARDS REPORTING

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Assessment Questions/ Requirements	Justificati on of Relevance (Yes/pote ntially/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
 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			
 The Project shall not directly or indirectly lead to/contribute to adverse impacts on gender equality and/or the situation of women Sexual harassment and/or any forms of violence against women address the multiple risks of gender-based violence, including sexual exploitation or human trafficking. 	No	Not relevant	Not required
 b. Slavery, imprisonment, physical and mental drudgery, punishment or coercion of women and girls. 	No	Not relevant	Not required
c. Restriction of women's rights or access to resources (natural or economic).	No	Not relevant	Not required

 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
 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	
Pr	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	
Pr	inciple 4.1 Sites of Cultural and	Historical H	eritage		
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	
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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 Oth	ner Rights			
 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				
 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/institut ion 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. a. b. c. d. f.	Working agreements with all individual workers shall be documented and implemented and include: Working hours (must not exceed 48 hours per week on a regular basis), AND Duties and tasks, AND Remuneration (must include provision for payment of overtime), AND Modalities on health insurance, AND Modalities on termination of the contract with provision for voluntary resignation by employee, AND 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	Consequence	S	
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	•		
 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			
 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			

 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 Modificat	ion 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 Natu	ural Disaster		
 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			

 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 & Fertilise	ers			
1. Will the Project involve the application of pesticides and/or fertilisers?	No	Not applicable	Not required	
Principle 9.7 Harvesting of Forest	S			
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				
 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	No	Not applicable	Not required
Does the Project potentially impact other areas where endangered species may be present through transboundary affects?			

SECTION G. STAKEHOLDER INPUTS AND LEGAL DISPUTES

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

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 NA^{19}

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

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 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 <u>accompanying Guide</u> to help the user understand detailed rules and requirements
1.0	10 July 2017	Initial adoption