

**TEMPLATE**

# MONITORING REPORT

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**PUBLICATION DATE** 14.10.2020

**VERSION** v. 1.1

**RELATED SUPPORT - TEMPLATE GUIDE Monitoring Report v. 1.1**

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This document contains the following Sections

Key Project Information

SECTION A - Description of project

SECTION B - Implementation of project

SECTION C - Description of monitoring system applied by the project

SECTION D - Data and parameters

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## KEY PROJECT INFORMATION

### Programme of Activity Information

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

### Key Project Information

|  |   |
|--|---|
| <b>GS ID (s) of Project (s)</b>  | <b>GS11474, GS11475, GS11476, GS11477, GS11481</b>  |
| <b>Title of the project (s) covered by monitoring report</b>                     | <p>GS11450 - MICROENERGY CREDITS - MICROFINANCE FOR CLEAN ENERGY PRODUCT LINES - INDIA</p> <p>GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - MicroEnergy Credits PoA – CPA 02- GS11474</p> <p>GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - MicroEnergy Credits PoA – CPA 03- GS11475</p> <p>GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - MicroEnergy Credits PoA – CPA 04- GS11476</p> <p>GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - MicroEnergy Credits PoA – CPA 07- GS11477</p> <p>GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - MicroEnergy Credits PoA – CPA 11- GS11481</p> |
| <b>Version number of the PDD/VPA-DD (s) applicable to this monitoring report</b> | <p>VPA2 – 5.0</p> <p>VPA3 – 4.0</p> <p>VPA4 - 6.0</p> <p>VPA7 - 5.0</p> <p>VPA11-.5.0</p>   |
| <b>Version number of the monitoring report</b>                                   | 2   |

|   |   |
|---|---|
| <b>Completion date of the monitoring report</b>     | 6/08/2023   |
| <b>Date of project design certification</b>         | 27/01/2023– VPA 2<br>27/01/2023– VPA 3<br>18/11/2022– VPA 4<br>11/04/2023- VPA 7<br>11/04/2023- VPA 11  |
| <b>Date of Last Annual Report</b>                   | NA  |
| <b>Monitoring period number</b>                     | 2   |
| <b>Duration of this monitoring period</b>           | 01/01/2022 to 31/12/2022 (inclusive of both days)<br>Monitoring period falls under crediting period (CP) 2:<br>27/02/2020 to 26/02/2025 for VPA-2<br>20/03/2020 to 19/03/2025 for VPA-3<br>20/03/2020 to 19/03/2025 for VPA- 4<br>01/05/2020 to 30/04/2025 for VPA –7<br>07/12/2021 to 06/12/2026 for VPA –11 |
| <b>Project Representative</b>                       | Micro Energy Credits Corporation Private Limited  |
| <b>Host Country</b>                                 | India   |
| <b>Activity Requirements applied</b>                | <input checked="" type="checkbox"/> Community Services Activities<br><input type="checkbox"/> Renewable Energy Activities<br><input type="checkbox"/> Land Use and Forestry Activities/Risks & Capacities<br><input type="checkbox"/> N/A   |
| <b>Methodology (ies) applied and version number</b> | AMS–III.AR “Substituting fossil fuel based lighting with LED/CFL lighting systems” Version 07)<br>Technologies and Practices to Displace Decentralized Thermal Energy Consumption (TPDDTEC), version 3.1  |
| <b>Product Requirements applied</b>                 | <input checked="" type="checkbox"/> GHG Emissions Reduction & Sequestration<br><input type="checkbox"/> Renewable Energy Label<br><input type="checkbox"/> N/A  |

**Table 1 - Sustainable Development Contributions Achieved**

| Sustainable Development Goals Targeted | SDG Impact   | Amount Achieved | Units/ Products         |
|--|--|-----------------|-------------------------|
| 13 Climate Action (mandatory)          | Number of VERs (ICS)   | VPA 2           | 31236                   |
|  |  | VPA 3           | 25745                   |
|  |  | VPA 4           | 41,509                  |
|  |  | VPA 7           | 43,664                  |
|  |  | VPA 11          | 21,605                  |
|  |  |                 | tCO <sub>2</sub> e VERs |
| 13 Climate Action (mandatory)          | Number of VERs (SLS)   | VPA 2           | 5875                    |
|  |  | VPA 3           | 6278                    |
|  |  | VPA 4           | 1587                    |
|  |  | VPA 7           | 8534                    |
|  |  | VPA 11          | 12,415                  |
|  |  |                 | tCO <sub>2</sub> e VERs |
| 13 Climate Action (mandatory)          | Number of VERs (ICS+SLS)   | VPA 2           | 37112                   |
|  |  | VPA 3           | 32,023                  |
|  |  | VPA 4           | 43,096                  |
|  |  | VPA 7           | 52,198                  |
|  |  | VPA 11          | 34,020                  |
|  |  |                 | tCO <sub>2</sub> e VERs |
| 7 Affordable and Clean Energy          | Number of households having operational clean energy product (ICS) | VPA 2           | 16357                   |
|  |  | VPA 3           | 9600                    |
|  |  | VPA 4           | 16,821                  |
|  |  | VPA 7           | 16008                   |
|  |  | VPA 11          | 8,474                   |
|  |  |                 | Number                  |
| 7 Affordable and Clean Energy          | Number of households having operational clean energy product (SLS) | VPA 2           | 94273                   |
|  |  | VPA 3           | 63562                   |
|  |  | VPA 4           | 8376                    |
|  |  | VPA 7           | 35061                   |
|  |  | VPA 11          | 179952                  |
|  |  |                 | Number                  |
| 8 Decent Work and Economic Growth      | Total number of jobs created                                       | VPA 2           | 23                      |
|  |  | VPA 3           | 43                      |
|  |  | VPA 4           | 30                      |
|  |  | VPA 7           | 60                      |
|  |  | VPA 11          | 48                      |
|  |  |                 | Number                  |

**Table 2 – Product Vintages**

| Start Dates | End Dates  | Amount Achieved |             |             |             |              |              |
|-------------|------------|-----------------|-------------|-------------|-------------|--------------|--------------|
|             |            | VERs            |             |             |             |              |              |
| 01/01/2022  | 31/12/2022 |                 |             |             |             |              |              |
|             |            | <b>Tech</b>     | <b>VPA2</b> | <b>VPA3</b> | <b>VPA4</b> | <b>VPA 7</b> | <b>VPA11</b> |
|             |            | ICS             | 31236       | 25745       | 41,509      | 43,664       | 21,605       |
|             |            | SLS             | 5875        | 6278        | 1,587       | 8534         | 12,415       |
|             |            | Total           | 37111       | 32023       | 43,096      | 52,198       | 34,020       |

## 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 of India, the predominant means of cooking are traditional cook stoves that use woody biomass as fuel. The smoke and fumes from these stoves contribute heavily to indoor air pollution, which overall claim approximately 400,000 lives per year in India<sup>1</sup>. In rural areas of India, households are either not connected to the grid or in households even with grid connectivity, there are frequent power outages and low voltage so rural households must use kerosene for indoor lighting, which also contributes to indoor air pollution and GHG emissions.

The 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

<sup>1</sup> <http://www.pciaonline.org/sierra-club>

Dharmasthala Rural Development Project (SKDRDP)<sup>2</sup>, Cedar (formerly ESAF) and Canara. Solar lighting system are implemented by SKDRDP, ESAF, Muthoot, Sarala Women Welfare Society (Sarala)..

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

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

The goal of the 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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### **VPA2- GS11474**

- a. Host Party (ies) - India
- b. Region/State/Province – Kerala (KL) and Tamil Nadu(TN) states for improved cookstoves and several regions within these states. For solar lighting systems, the states such as Kerala (KL), Tamil Nadu (TN), Madhya Pradesh (MP), Maharashtra (MH), and Chhattisgarh (CG) 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.

### **VPA3- GS11475**

- a. Host Party (ies) - India

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

<sup>2</sup> [skdrdpindia.org](http://skdrdpindia.org)

- b. Region/State/Province – Kerala (KL) state for improved cookstoves. For solar lighting systems, several states such as Gujarat (GJ), Karnataka (KA), Madhya Pradesh (MP), Maharashtra (MH), Pondicherry (PD), Kerala (KL), Uttar Pradesh (UP), Odisha (OD) and 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.

#### **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.

#### **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.

#### **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.



### A.3. Reference of applied methodology

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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”<sup>3</sup>

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

#### A.4. Crediting period of project

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| VPA Reference Number | Crediting Start Date | GS4GG Crediting End Date (CP1) | Crediting Start Date (CP-2) <sup>4</sup> | GS4GG Crediting End Date | GS4GG Eligible Crediting End Date <sup>5</sup> |
|----------------------|----------------------|--------------------------------|--|--------------------------|--|
| GS11474              | 27/02/2015           | 26/02/2020                     | 27/02/2020                               | 26/02/2025               | 26/02/2030                                     |
| GS11475              | 20/03/2015           | 19/03/2020                     | 20/03/2020                               | 19/03/2025               | 19/03/2030                                     |
| GS11476              | 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                                     |
| GS11481              | 07/12/2016           | 06/12/2021                     | 07/12/2021                               | 06/12/2026               | 06/12/2031                                     |

## SECTION B. IMPLEMENTATION OF PROJECT

### B.1. Description of implemented project

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These are the 5 VPAs implemented in this Batch.

#### **VPA2 - GS ID: GS11474**

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

Purpose: Under the VPA, Micro Energy Credits works with PO – Evangelical Social Action Forum Microfinance (ESAF) 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 PO’s to implement the clean energy lending program, as well as a

<sup>3</sup> [TPDDTEC version 3.1](#)

<sup>4</sup> VPA 5 has issued CERs till end of 26/06/2020.

<sup>5</sup> As these are CDM Transitioned projects, GS4GG allows a total crediting period of 15-years from the CDM crediting start date

robust and transparent carbon credit monitoring and tracking system to quantify and record the volume of carbon emission reductions created through the clean energy program.

Measures taken: The VPA involves marketing, distributing, and financing solar lighting systems and improved cook stoves for low-income households and microentrepreneurs in Kerala (KL), Tamil Nadu (TN), Chhattisgarh (CG), Madhya Pradesh (MP) and Maharashtra (MH). 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 – 32,976

Solar Lighting systems – 121,676 (i.e. 145,386 Solar Lamps)

| <b>Year</b>  | <b>Improved Cookstove</b> | <b>Solar Lighting systems</b> |
|--------------|---------------------------|-------------------------------|
| 2013         | 1,984                     | 3,691                         |
| 2014         | 30,992                    | 26,686                        |
| 2015         | -                         | 49,585                        |
| 2016         | -                         | 41,714                        |
| <b>Total</b> | <b>32,976</b>             | <b>121,676</b>                |
| <b>Year</b>  | <b>Improved Cookstove</b> | <b>Solar Lighting systems</b> |

No further sales have been added under the current monitoring period (01/01/2022 to 31/12/2022).

#### **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 including their technical specifications is as follows –

### 1. BPL SL-1300

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/1.3W

Lighting Wattage – 1.4

Luminous flux output (Lumens): 135

Lumen maintenance (for 2,000 hours): 95.5%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps):1

Battery type/capacity-Lithium Ferro Phosphate/1.6Ah, 3.3V

Type of charge controller -PMW

Solar Run time(SRT): 4 hours

Warranty – 1 year

### 2. BPL SL-1700

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/3W

Lighting Wattage – 1.4

Luminous flux output (Lumens): 165

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/2.2Ah, 7.2V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

### 3. Greenlight Planet Sunking PRO 2 (Sunking Pro2)

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/3W

Lighting Wattage – 3

Luminous flux output (Lumens): 135

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 Ferro-Phosphate/3Ah, 3.3V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

### 4. Duron Mitva Combo 1 (RAL MS 352 + MS 16)

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/3.5W  
Lighting Wattage – 2.5  
Luminous flux output (Lumens): 224  
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, 3.2V  
Type of charge controller -PMW  
Solar Run time(SRT): 4-5hours  
Warranty – 1 year

#### 5. RAL Duron Mitva MS 352

The technical specifications of this product are –  
Type and Solar Panel Wattage: Polycrystalline/3.4W  
Lighting Wattage – 1.9  
Luminous flux output (Lumens): 190  
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/5Ah, 3.7V  
Type of charge controller -PMW  
Solar Run time(SRT): 5hours  
Warranty – 1 year

#### 6. Duron Mitva Combo 2 (RAL MS 322 + MS 16)

The technical specifications of this product are –  
Type and Solar Panel Wattage: Polycrystalline/2.5W  
Lighting Wattage – 1.5  
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-Lithium ion/2.6Ah, 3.2V  
Type of charge controller -PMW  
Solar Run time(SRT): 4-5hours  
Warranty – 1 year

#### 7. Mitva MH 536

The technical specifications of this product are –  
Type and Solar Panel Wattage: Polycrystalline/2.5W  
Lighting Wattage – 2  
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/3.6Ah, 3.7V  
Type of charge controller -PMW

Solar Run time(SRT): 4hours

Warranty – 1 year

#### 8. Orb Energy SOL-10

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/3.8W

Lighting Wattage – 1

Luminous flux output (Lumens): 73

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/4.5Ah, 3.7V

Type of charge controller -PMW

Solar Run time(SRT): 5hours

Warranty – 1 year

#### 9. Barefoot Power Go -250

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/2.5W

Lighting Wattage – 1.6

Luminous flux output (Lumens): 135

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 Ferro Phosphate/3.3Ah, 3.3 V

Type of charge controller -PMW

Solar Run time(SRT): 6hours

Warranty – 1 year

#### 10. Barefoot Power Connect 600

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/6W

Lighting Wattage – 3

Luminous flux output (Lumens): 300

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-SMF/5Ah, 3.3V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

#### 11. Barefoot Power Connect 620B

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/12W

Lighting Wattage – 4.5

Luminous flux output (Lumens): 365

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-SMF/12Ah, 3.3V  
Type of charge controller -PMW  
Solar Run time(SRT): 4-5hours  
Warranty – 1 year

#### 12. Barefoot Power Firefly Mobile

The technical specifications of this product are –  
Type and Solar Panel Wattage: Polycrystalline/1.5W  
Lighting Wattage – 0.6  
Luminous flux output (Lumens): 63  
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 PO/0.75Ah, 3.3 V  
Type of charge controller -PMW  
Solar Run time(SRT): 4-5hours  
Warranty – 1 year

#### 13. Greenlight Planet Sunking ProX (Sunking ProX)

The technical specifications of this product are –  
Type and Solar Panel Wattage: Polycrystalline/10W  
Lighting Wattage – 1.093  
Luminous flux output (Lumens): 175  
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 Ferro Phosphate/3Ah, 3.3V  
Type of charge controller -PMW  
Solar Run time(SRT): 4-5hours  
Warranty – 1 year

#### 14. Greenlight Planet Home Lighting (Sunking HLS)

The technical specifications of this product are –  
Type and Solar Panel Wattage: Polycrystalline/6.3W  
Lighting Wattage – 2.64  
Luminous flux output (Lumens): 100  
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 ferro phosphate/6Ah, 3.3V  
Type of charge controller -PMW  
Solar Run time(SRT): 4-5hours  
Warranty – 1 year

**c. Relevant dates for the VPA –**

1. Construction/Implementation date – The stoves under this VPA are implemented from 27/06/2013 to 31/10/2014. The solar lighting systems are implemented from 07/01/2013 to 20/06/2016.
2. Commissioning – 32,976 Improved cookstoves and 121,676 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.
3. Continued operation periods – All of the functional products were continuously operational during the course of this monitoring period. Non-functional products are discounted in emission reduction calculation.

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

The total GHG emission reduction achieved in this monitoring period for the VPA is 37,112 tCO<sub>2</sub>e.

**VPA3 - GS ID: GS11475**

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

Purpose: Under the VPA, Micro Energy Credits works with PO – Evangelical Social Action Forum Microfinance (ESAF) and Muthoot Microfin Ltd, (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. MicroEnergy Credits trains the PO's to implement the clean energy lending program, as well as a robust and transparent carbon credit monitoring and tracking system to quantify and record the volume of carbon emission reductions created through the clean energy program.

Measures taken: The VPA involves marketing, distributing, and financing solar lighting systems and improved cook stoves for low income households and microentrepreneurs in Kerala (KL), Tamil Nadu (TN), Karnataka (KA), Gujarat (GJ), Maharashtra (MH), Madhya Pradesh (MP), Uttar Pradesh (UP), Odisha (OD), Pondicherry (PD). 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 – 17,831

Solar Lamps –86,400 solar lamps (i.e., 79,849 solar lighting system)

| Year         | Smart Stoves  | Solar Lighting Systems |
|--------------|---------------|------------------------|
| 2013         | 23            | -                      |
| 2014         | 16,043        | -                      |
| 2015         | 1,702         | -                      |
| 2016         | 2             | 65,337                 |
| 2017         | -             | 13,779                 |
| 2018         | 61            | 733                    |
| <b>Total</b> | <b>17,831</b> | <b>79,849</b>          |

No further sales have been added under the current monitoring period (01/01/2022 to 31/12/2022).

#### 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

##### Solar lighting system:

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

##### 1. BPL SL-1300

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/1.3W

Lighting Wattage – 1.4

Luminous flux output (Lumens): 135

Lumen maintenance (for 2,000 hours): 95.5%

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps):1

Battery type/capacity-Lithium Ferro Phosphate/1.6Ah, 3.3V

Type of charge controller -PMW

Solar Run time(SRT): 4 hours

Warranty – 1 year

##### 2. BPL SL-1700

The technical specifications of this product are –



Type and Solar Panel Wattage: Polycrystalline/3W

Lighting Wattage – 1.4

Luminous flux output (Lumens): 165

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/2.2Ah, 7.2V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

### 3. Greenlight Planet Sunking PRO 2 (Sunking Pro2)

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/3W

Lighting Wattage – 3

Luminous flux output (Lumens): 135

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 Ferro-Phosphate/3Ah, 3.3V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

### 4. RAL Duron Mitva MS 352

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/3.4W

Lighting Wattage – 1.9

Luminous flux output (Lumens): 190

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/5Ah, 3.7V

Type of charge controller -PMW

Solar Run time(SRT): 5hours

Warranty – 1 year

### 5. Duron Mitva Combo 2 (RAL MS 322 + MS 16)

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/2.5W

Lighting Wattage – 1.5

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-Lithium ion/2.6Ah, 3.2V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

### 6. Mitva MH 536

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/2.5W

Lighting Wattage – 2

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/3.6Ah, 3.7V

Type of charge controller -PMW

Solar Run time(SRT): 4hours

Warranty – 1 year

7. Barefoot Power Go -250

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/2.5W

Lighting Wattage – 1.6

Luminous flux output (Lumens): 135

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 Ferro Phosphate/3.3Ah, 3.3 V

Type of charge controller -PMW

Solar Run time(SRT): 6hours

Warranty – 1 year

8. Greenlight Planet Home Lighting (Sunking HLS)

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/6.3W

Lighting Wattage – 2.64

Luminous flux output (Lumens): 100

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 ferro phosphate/6Ah, 3.3V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

9. Duron Mitva MS – 322A

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): 95.5%

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): 4-5 hours

Warranty – 1 year

10. RAL Duron Mitva MS 352A

Type and Solar Panel Wattage: Polycrystalline/3.4W

Lighting Wattage – 2

Luminous flux output (Lumens): 148.8

Lumen maintenance (for 2,000 hours): 95.5%  
Rated lamp life: greater than 10,000 hours  
Lighting point (number of project lamps):1  
Battery type/capacity-Lithium Ferro Phosphate/5Ah, 3.7V  
Type of charge controller -PMW  
Solar Run time(SRT): 5 hours  
Warranty – 1 year

**c. Relevant dates for the VPA –**

- a) Construction/Implementation date – The stoves under this VPA are implemented from 05/08/2013 to 29/11/2018. The solar lighting systems under this VPA are implemented from 21/06/2016 to 17/05/2018.
- b) Commissioning – 17,831 Improved cookstoves and 86,400 Solar Lamps (79,849 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 VPA is 32023 tCO<sub>2</sub>e.

**VPA4 - GS ID: GS11476**

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

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

Measures taken: The VPA 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)

| Year         | Improved Cookstove | Solar Lamps   |
|--------------|--------------------|---------------|
| 2013         | 804                | 7,342         |
| 2014         | 29,133             | 10,341        |
| 2015         | -                  | 24,660        |
| 2016         | -                  | 13,999        |
| <b>Total</b> | <b>29,937</b>      | <b>56,342</b> |

No further sales have been added under the current monitoring period (01/01/2022 to 31/12/2022).

**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

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

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/10W

Lighting Wattage – 3.6

Luminous flux output (Lumens): 324

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

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps):2

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

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

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

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/10W

Lighting Wattage – 16.8

Luminous flux output (Lumens): 1512

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

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps):4

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

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

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

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/20W

Lighting Wattage – 9

Luminous flux output (Lumens): 780

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

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 2

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

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

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

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/60W

Lighting Wattage – 32

Luminous flux output (Lumens): 2880

Lumen maintenance (for 2,000 hours): 95.75%  
Rated lamp life: greater than 10,000 hours  
Lighting point (number of project lamps):6  
Battery type/capacity-Lead Acid Battery/80Ah, 12V  
Type of charge controller -PMW  
Solar Run time(SRT): 4-5hours  
Warranty – 1 year

7. Bright Light Home 2 HLS (Model Number – BH2HLS):  
The technical specifications of this product are –  
Type and Solar Panel Wattage: Polycrystalline/12W  
Lighting Wattage – 6  
Luminous flux output (Lumens): 540  
Lumen maintenance (for 2,000 hours): 95.75%  
Rated lamp life: greater than 10,000 hours  
Lighting point (number of project lamps):2  
Battery type/capacity-Lead Acid Battery/15Ah, 12V  
Type of charge controller -PMW  
Solar Run time(SRT): 4-5hours  
Warranty – 1 year

8. Bright Light Home 3 HLS (Model Number – BH3HLS):  
The technical specifications of this product are –  
Type and Solar Panel Wattage: Polycrystalline/18W  
Lighting Wattage – 12.5  
Luminous flux output (Lumens): 1125  
Lumen maintenance (for 2,000 hours): 95.75%  
Rated lamp life: greater than 10,000 hours  
Lighting point (number of project lamps):3  
Battery type/capacity-Lead Acid Battery/20Ah, 12V  
Type of charge controller -PMW  
Solar Run time(SRT): 4-5hours  
Warranty – 1 year

9. Bright Light Home 4 HLS (Model Number – BH4HLS):  
The technical specifications of this product are –  
Type and Solar Panel Wattage: Polycrystalline/40W  
Lighting Wattage – 14  
Luminous flux output (Lumens): 1260  
Lumen maintenance (for 2,000 hours): 95.75%  
Rated lamp life: greater than 10,000 hours  
Lighting point (number of project lamps):2  
Battery type/capacity-Lead Acid Battery/60Ah, 12V  
Type of charge controller -PMW  
Solar Run time(SRT): 4-5hours  
Warranty – 1 year

10. Model Number – CC4F1HLS2:

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/40W

Lighting Wattage – 32

Luminous flux output (Lumens): 2520

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

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps):4

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

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

11. Model Number – CC4F2HLS:

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/40W

Lighting Wattage – 30

Luminous flux output (Lumens): 2350

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

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 4

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

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

12. Model Number – CC3F1HLS:

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/40W

Lighting Wattage – 25

Luminous flux output (Lumens): 1970

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

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 3

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

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

13. Model Number – CC8HLS:

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/75W

Lighting Wattage – 60

Luminous flux output (Lumens): 4700

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

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 8

Battery type/capacity-Lead Acid Battery/40Ah, 12V  
Type of charge controller -PMW  
Solar Run time(SRT): 4-5hours  
Warranty – 1 year

14. Model Number – CL1C2HLS:

The technical specifications of this product are –  
Type and Solar Panel Wattage: Polycrystalline/20W  
Lighting Wattage – 12.4  
Luminous flux output (Lumens): 1010  
Lumen maintenance (for 2,000 hours): 95.75%  
Rated lamp life: greater than 10,000 hours  
Lighting point (number of project lamps): 4  
Battery type/capacity-Lead Acid Battery/40Ah, 12V  
Type of charge controller -PMW  
Solar Run time(SRT): 4-5hours  
Warranty – 1 year

15. Model Number – CL2B1HLS:

The technical specifications of this product are –  
Type and Solar Panel Wattage: Polycrystalline/20W  
Lighting Wattage – 8.4  
Luminous flux output (Lumens): 900  
Lumen maintenance (for 2,000 hours): 95.75%  
Rated lamp life: greater than 10,000 hours  
Lighting point (number of project lamps): 3  
Battery type/capacity-Lead Acid Battery/40Ah, 12V  
Type of charge controller -PMW  
Solar Run time(SRT): 4-5hours  
Warranty – 1 year

16. Model Number – CL2C2HLS:

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

17. Model Number – CL2HLS2-2LED:

The technical specifications of this product are –  
Type and Solar Panel Wattage: Polycrystalline/15W



Lighting Wattage – 4.8

Luminous flux output (Lumens): 500

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

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 2

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

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

18. Model Number – CL3C1HLS:

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/20W

Lighting Wattage – 14.2

Luminous flux output (Lumens): 1300

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

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 4

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

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

19. Model Number – CL3HLS:

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/20W

Lighting Wattage – 8.4

Luminous flux output (Lumens): 900

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

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 3

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

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

20. Model Number – CL4HLS:

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/20W

Lighting Wattage – 9.6

Luminous flux output (Lumens): 1050

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

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 4

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

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

21. Model Number – PL2C4HLS:

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/75W

Lighting Wattage – 52.4

Luminous flux output (Lumens): 4250

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

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps): 4

Battery type/capacity-Lead Acid Battery/75Ah, 12V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

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

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/100W

Lighting Wattage – 60

Luminous flux output (Lumens): 5400

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

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps):8

Battery type/capacity-Lead Acid Battery/150Ah, 12V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

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

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/120W

Lighting Wattage – 82

Luminous flux output (Lumens): 7380

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

Rated lamp life: greater than 10,000 hours

Lighting point (number of project lamps):10

Battery type/capacity-Lead Acid Battery/120Ah, 12V

Type of charge controller -PMW

Solar Run time(SRT): 4-5hours

Warranty – 1 year

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

The technical specifications of this product are –

Type and Solar Panel Wattage: Polycrystalline/120W

Lighting Wattage – 91

Luminous flux output (Lumens): 4700

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

Rated lamp life: greater than 10,000 hours  
Lighting point (number of project lamps): 12  
Battery type/capacity-Lead Acid Battery/120Ah, 12V  
Type of charge controller -PMW  
Solar Run time(SRT): 4-5hours  
Warranty – 1 year

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

26. Super Bright Home 5 HLS (Model Number – SB5HLS):  
The technical specifications of this product are –  
Type and Solar Panel Wattage: Polycrystalline/50W  
Lighting Wattage – 25  
Luminous flux output (Lumens): 2250  
Lumen maintenance (for 2,000 hours): 95.75%  
Rated lamp life: greater than 10,000 hours  
Lighting point (number of project lamps):3  
Battery type/capacity-Lead Acid Battery/80Ah, 12V  
Type of charge controller -PMW  
Solar Run time(SRT): 4-5hours  
Warranty – 1 year

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

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

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

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

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

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

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

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

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

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

32. Model Number – SHLS6):

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

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

The technical specifications of this product are –  
The technical specifications of this product are –  
Type and Solar Panel Wattage: Polycrystalline/20W  
Lighting Wattage – 12.4  
Luminous flux output (Lumens): 1010  
Lumen maintenance (for 2,000 hours): 95.75%  
Rated lamp life: greater than 10,000 hours  
Lighting point (number of project lamps): 4  
Battery type/capacity-Lead Acid Battery/30Ah, 12V  
Type of charge controller -PMW  
Solar Run time(SRT): 4-5hours  
Warranty – 1 year

**c. Relevant dates for the VPA –**

1. 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.
2. Commissioning – 29,937 Improved cookstoves and 56,342 Solar Lamps (19,794 solar lighting systems) are distributed till date under this VPA. The exact commissioning/installation dates for all the CEPs are mentioned in the Emission Reduction Calculation sheet for this VPA.
3. Continued operation periods – All of the functional products were continuously operational during the course of this monitoring period. Non-functional products are discounted in emission reduction calculation.

**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 **43,096** tCO<sub>2</sub>e.

**VPA7 - GS ID: GS11477**

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

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

Measures taken: The VPA 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 VPA till date is:

Improved cookstoves – 28,495

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

| Year         | Improved Cookstoves |            |              |                |
|--------------|---------------------|------------|--------------|----------------|
|              | Karnataka           | Tamil Nadu | Chhattisgarh | Madhya Pradesh |
| 2013         | 1                   | -          | -            | -              |
| 2014         | 8,941               | 888        | 2,473        | 1,689          |
| 2015         | 14,395              | 89         | 19           | -              |
| <b>Total</b> | <b>23,337</b>       | <b>977</b> | <b>2,492</b> | <b>1,689</b>   |

| Year         | Solar Lamps    |
|--------------|----------------|
| 2017         | 34,373         |
| 2018         | 58,912         |
| 2019         | 33,219         |
| <b>Total</b> | <b>126,504</b> |

No further sales have been added under the current monitoring period (01/01/2022 to 31/12/2022).

## **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%

## **3. Solar Lighting Systems:**

The solar lamp models implemented under this VPA 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

#### 4. Relevant dates for the VPA –

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 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.

#### 5. 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 48,924 tCO<sub>2</sub>e.

#### **VPA11 - GS ID: GS11481**

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

Purpose: Under the VPA, Micro Energy Credits works with PO – Evangelical Social Action Forum (ESAF), Muthoot Microfin Limited (Muthoot) to develop a successful and diversified clean energy lending program. The clean energy program addresses typical



barriers for low income clients including education, price, finance, and supply and aftersales service. Micro Energy Credits trains the POs to implement the clean energy lending program, as well as a robust and transparent carbon credit monitoring and tracking system to quantify and record the volume of carbon emission reductions created through the clean energy program.

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

Improved cookstoves – 14,220

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

| Year         | Jumbo Stove-Karnataka | Jumbo Stove-Kerala | Smart Stove-Karnataka | Smart Stove-Maharashtra | PowerGram-Tamil Nadu |
|--------------|-----------------------|--------------------|-----------------------|-------------------------|----------------------|
| 2014         | -                     | -                  | -                     | 7,322                   | -                    |
| 2015         | 210                   | 4,786              | 33                    | 31                      | -                    |
| 2016         | 259                   | 164                | 1                     | -                       | 1,327                |
| 2017         | 86                    | -                  | -                     | -                       | 1                    |
| <b>Total</b> | <b>555</b>            | <b>4,950</b>       | <b>34</b>             | <b>7,353</b>            | <b>1,328</b>         |

| Year         | Solar Lighting System |
|--------------|-----------------------|
| 2015         | 96,375                |
| 2016         | 107,101               |
| 2017         | 39,112                |
| <b>Total</b> | <b>242,588</b>        |

No further sales have been added under the current monitoring period (01/01/2022 to 31/12/2022).

#### **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 VPA –**

- a. Construction/Implementation date – The improved cookstoves under this VPA 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 VPA, including information on how double counting is avoided .**

The total GHG emission reductions achieved in this monitoring period for the VPA is 34,020tCO<sub>2</sub>e.

**e. Avoiding double counting –**

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

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

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

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

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

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

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

The MEC Credit Tracker Platform maintains data on all installations, including each CEP unique identifier number, the date of installation and the VPA/PoA with which they are associated. The platform’s use of locations for each installation will ensure that each clean energy product is only included in a single VPA under a single PoA. The credit

tracker platform also allocates a system generated number call "sysnum" to each installation under the PoA. No two CEP installations can have the same "sysnum".

B.1.1 Forward Action Requests

>>

NA

**B.2. Post-Design Certification changes**

>>

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

>>

NA

B.2.2. Corrections

>>

NA

B.2.3. Changes to start date of crediting period

>>

NA

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

>>

NA

B.2.5. Changes to project design of approved project

>>

NA

## SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

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

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

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

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

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

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

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

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

#### Summary:

1. Each PO keeps a record of all the CEPs it installs in the MEC Credit Tracker Platform. The record includes the name, date of installation, model of CEP and location of the product. All records are screened by the CME and cross-checked with the PO records to confirm the installation record is authentic and no double counting occurs.
2. The values of the emission reduction parameters required for ex-post ER calculation - project fuel consumption (pp,y) or efficiency of ICS , number of ICS still operating (Up,y).
3. The records kept in the MEC Credit Tracker Platform relate to paper copies of title transfer agreements received from individual households.

#### Quality assurance

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

#### Generalities

The CME along with the PO coordinated all ex-post monitoring activities. The CME is ultimately responsible for implementing the monitoring plan, ensuring the quality of data obtained and the use of this data for emissions reduction calculations. However, the actual field measurements to be conducted during monitoring (e.g. project KPT) has been performed by enumerators trained by CME and PO field staff. Sampled households were visited for 4 days to collect the data on the fuel consumption for cooking. Fuelwood was not supplied separately but a small bundle from household stock was separated and provided to households to be used for the KPT. Each day enumerator or field staff would visit the household between 6-7 a.m. before the first meal is cooked. All enumerators would carry weighing scale and moisture meter to take the measurements. The data would be collected directly in the Microsoft excel.

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

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

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

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

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

## TECHNICAL FAILURE AND MAINTENANCE PROTOCOL

SKDRDP, Muthoot, ESAF and Canara have a robust aftersales mechanism in place which ensures customer complaints are registered and resolved in a timely manner. The mechanism involves various steps:

- Step 1: Complain Registration
- Step 2: Logging complaint
- Step 3: Collection of product for repair
- Step 4: Resolution of the complaint
- Step 5: Feedback (optional)

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

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

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

For ICS, total repairs done were 154, 76, 32, 40, 52 for VPA 2,3,7, & 11 respectively. For SLS, total repairs done were 4072, 571, 823, 831 and 4120 for VPA 2,3,7 & 11. It can be confirmed through credit tracker output file where the data from the partner is stored. Sample tracker screenshots and sample service request forms have been submitted.

## SECTION D. DATA AND PARAMETERS

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

>>

SDG 13

#### Improved Cookstoves:

| Data/parameter | $P_{b,y}$  |
|----------------|--|
| Unit           | kg/household-day   |
| Description    | Quantity of fuel that is consumed in baseline scenario b during year y |
| Source of data | Baseline FT or default baseline fuelwood consumption                   |



|  |  |                |              |
|--|--|----------------|--------------|
| Value(s) applied                                     | <b>VPA Number</b>                            | <b>State</b>   | <b>Value</b> |
|  | VPA 2  | Tamil Nadu     | 6.90         |
|  |  | Kerala         | 7.00         |
|  | VPA 3  | Kerala         | 7.28         |
|  | VPA 4  | Karnataka      | 7.02         |
|  | VPA 7  | Karnataka      | 6.99         |
|  |  | Tamil Nadu     | 6.85         |
|  |  | Chhattisgarh   | 6.99         |
|  |  | Madhya Pradesh | 7.13         |
|  | VPA 11                                       | Karnataka      | 7.13         |
| Kerala   |  | 6.93           |              |
| Maharashtra  |  | 7.19           |              |
| Tamil Nadu   |  | 7.14           |              |
| Choice of data or Measurement methods and procedures | Baseline Study in section B.4 of the VPA-DD. |                |              |
| Purpose of data                                      | For baseline emission calculations           |                |              |
| Additional comment                                   | -  |                |              |

|  |   |
|--|---|
| Data/parameter                                       | $EF_{b,i,CO_2}$   |
| Unit   | tCO <sub>2</sub> /t <sub>fuel</sub>   |
| Description  | CO <sub>2</sub> emission factor arising from use of fuel type <i>i</i> in baseline scenario |
| Source of data                                       | Wood: Methodology default   |
| Value(s) applied                                     | Fuelwood / wood chips: 112 tCO <sub>2</sub> /TJ   |
| Choice of data or Measurement methods and procedures | Default IPCC values have been applied   |
| Purpose of data                                      | For baseline emission calculations  |
| Additional comment                                   | -   |

|                |                    |
|----------------|--------------------|
| Data/parameter | $EF_{b,i,nonCO_2}$ |
|----------------|--------------------|

|  |  |            |         |                       |        |
|--|--|------------|---------|-----------------------|--------|
| Unit   | tCO <sub>2</sub> /tfuel  |            |         |                       |        |
| Description  | Non-CO <sub>2</sub> 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 tCO <sub>2</sub> e/TJ  |            |         |                       |        |
| Choice of data or Measurement methods and procedures | Methodology defaults have been applied for wood  |            |         |                       |        |
|  | Parameter  | Value      | Average | Units                 | Source |
|  | EF_wood_CH4  | 258 – 2190 | 1224    | kgCO <sub>2</sub> /TJ |        |
|  | EF_wood_N2O  | 4 – 18.5   | 11.25   | KgCO <sub>2</sub> /TJ |        |
|  | GWP CH4  | 28         |         | tCO <sub>2</sub> /TJ  | AR5    |
|  | GWP N2O  | 265        |         | tCO <sub>2</sub> /TJ  | AR5    |
|  | EF <sub>b,fuel non-CO2</sub>   |            | 37.25   | tCO <sub>2</sub> /TJ  |        |
| Purpose of data                                      | For baseline emission calculations   |            |         |                       |        |
| Additional comment                                   | -  |            |         |                       |        |

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

|                       |                                |
|-----------------------|--------------------------------|
| <b>Data/parameter</b> | <b>EF<sub>p,i,nonCO2</sub></b> |
| Unit                  | tCO <sub>2</sub> /TJ           |

|  |  |            |         |                       |        |
|--|--|------------|---------|-----------------------|--------|
| Description  | Non-CO <sub>2</sub> emission factor arising from use of fuel type <i>i</i> used in project scenario                    |            |         |                       |        |
| Source of data                                       | IPCC default value as per 2006 IPCC Guidelines for National Greenhouse Gas Inventories volume 2, chapter 2 (Table 2.9) |            |         |                       |        |
| Value(s) applied                                     | 37.25 tCO <sub>2</sub> e/TJ (AR5 GWP)  |            |         |                       |        |
| Choice of data or Measurement methods and procedures | Default methodology values have been applied for wood  |            |         |                       |        |
|  | Parameter  | Value      | Average | Units                 | Source |
|  | EF_wood_CH4  | 258 – 2190 | 1224    | kgCO <sub>2</sub> /TJ |        |
|  | EF_wood_N2O  | 4 – 18.5   | 11.25   | KgCO <sub>2</sub> /TJ |        |
|  | GWP CH4  | 28         |         | tCO <sub>2</sub> /TJ  | AR5    |
|  | GWP N2O  | 265        |         | tCO <sub>2</sub> /TJ  | AR5    |
|  | EF <sub>b,fuel non-CO2</sub>   |            | 37.25   | tCO <sub>2</sub> /TJ  |        |
| Purpose of data                                      | For project emission calculations  |            |         |                       |        |
| Additional comment                                   | -  |            |         |                       |        |

|  |  |
|--|--|
| <b>Data/parameter</b>                                | <b>NCV<sub>b,i</sub></b>   |
| 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                                   | -  |

|                       |                          |
|-----------------------|--------------------------|
| <b>Data/parameter</b> | <b>NCV<sub>p,i</sub></b> |
| Unit                  | TJ/tonne                 |

|  |  |
|--|--|
| Description  | Net calorific value of the fuel type <i>i</i> used in the project scenario |
| Source of data                                       | Wood: Methodology default  |
| Value(s) applied                                     | Fuelwood / wood chips: 0.0156 TJ/tonnes                                    |
| Choice of data or Measurement methods and procedures | Default IPCC values for wood / wood waste are applied.                     |
| Purpose of data                                      | For project emission calculations  |
| Additional comment                                   | -  |

| Data/parameter                                       | $f_{NRB,b,i,y}$   |                |       |
|--|---|----------------|-------|
| Unit   | Fractional non-renewability   |                |       |
| Description  | Non-renewability status of woody biomass fuel type $i$ 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 2   | Tamil Nadu     | 0.913 |
|  |   | Kerala         | 0.874 |
|  | VPA 3   | Kerala         | 0.874 |
|  | VPA 4   | Karnataka      | 0.86  |
|  | VPA 7   | Karnataka      | 0.86  |
|  |   | Tamil Nadu     | 0.913 |
|  |   | Chhattisgarh   | 0.814 |
|  |   | Madhya Pradesh | 0.914 |
| VPA 11   | Karnataka   | 0.86           |       |
|  | Kerala  | 0.874          |       |
|  | Maharashtra   | 0.913          |       |
|  | Tamil Nadu  | 0.913          |       |
| Choice of data or Measurement methods and procedures | N.A.  |                |       |
| Purpose of data                                      | For emission reduction calculations   |                |       |
| Additional comment                                   | -   |                |       |

## For Solar Lighting Systems

### VPA 02, 03, 04, 07 & 11 (AMS III A.R)

| Data/parameter                                       | DV  |
|--|---|
| Unit   | tCO <sub>2</sub> 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 <sub>2</sub> 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   |

## D.2 Data and parameters monitored

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### Improved Cookstoves SDG 13

| Data / Parameter | P <sub>p,y</sub>   |        |  |     |             |        |       |          |        |          |        |       |          |        |       |          |        |       |          |        |          |        |          |        |          |        |        |          |        |          |        |
|------------------|--|--------|--|-----|-------------|--------|-------|----------|--------|----------|--------|-------|----------|--------|-------|----------|--------|-------|----------|--------|----------|--------|----------|--------|----------|--------|--------|----------|--------|----------|--------|
| 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 | <table><tr><th>VPA</th><th>Model/State</th><th>Values</th></tr><tr><td rowspan="2">VPA 2</td><td>Smart/TN</td><td>0.0039</td></tr><tr><td>Smart/KL</td><td>0.0038</td></tr><tr><td>VPA 3</td><td>Smart/KL</td><td>0.0037</td></tr><tr><td>VPA 4</td><td>Smart/KA</td><td>0.0035</td></tr><tr><td rowspan="4">VPA 7</td><td>Smart/KA</td><td>0.0032</td></tr><tr><td>Smart/CG</td><td>0.0035</td></tr><tr><td>Smart/MP</td><td>0.0033</td></tr><tr><td>Smart/TN</td><td>0.0033</td></tr><tr><td rowspan="2">VPA 11</td><td>Smart/KA</td><td>0.0032</td></tr><tr><td>Jumbo/KA</td><td>0.0034</td></tr></table> |        |  | VPA | Model/State | Values | VPA 2 | Smart/TN | 0.0039 | Smart/KL | 0.0038 | VPA 3 | Smart/KL | 0.0037 | VPA 4 | Smart/KA | 0.0035 | VPA 7 | Smart/KA | 0.0032 | Smart/CG | 0.0035 | Smart/MP | 0.0033 | Smart/TN | 0.0033 | VPA 11 | Smart/KA | 0.0032 | Jumbo/KA | 0.0034 |
| VPA              | Model/State  | Values |  |     |             |        |       |          |        |          |        |       |          |        |       |          |        |       |          |        |          |        |          |        |          |        |        |          |        |          |        |
| VPA 2            | Smart/TN   | 0.0039 |  |     |             |        |       |          |        |          |        |       |          |        |       |          |        |       |          |        |          |        |          |        |          |        |        |          |        |          |        |
|                  | Smart/KL   | 0.0038 |  |     |             |        |       |          |        |          |        |       |          |        |       |          |        |       |          |        |          |        |          |        |          |        |        |          |        |          |        |
| VPA 3            | Smart/KL   | 0.0037 |  |     |             |        |       |          |        |          |        |       |          |        |       |          |        |       |          |        |          |        |          |        |          |        |        |          |        |          |        |
| VPA 4            | Smart/KA   | 0.0035 |  |     |             |        |       |          |        |          |        |       |          |        |       |          |        |       |          |        |          |        |          |        |          |        |        |          |        |          |        |
| VPA 7            | Smart/KA   | 0.0032 |  |     |             |        |       |          |        |          |        |       |          |        |       |          |        |       |          |        |          |        |          |        |          |        |        |          |        |          |        |
|                  | Smart/CG   | 0.0035 |  |     |             |        |       |          |        |          |        |       |          |        |       |          |        |       |          |        |          |        |          |        |          |        |        |          |        |          |        |
|                  | Smart/MP   | 0.0033 |  |     |             |        |       |          |        |          |        |       |          |        |       |          |        |       |          |        |          |        |          |        |          |        |        |          |        |          |        |
|                  | Smart/TN   | 0.0033 |  |     |             |        |       |          |        |          |        |       |          |        |       |          |        |       |          |        |          |        |          |        |          |        |        |          |        |          |        |
| VPA 11           | Smart/KA   | 0.0032 |  |     |             |        |       |          |        |          |        |       |          |        |       |          |        |       |          |        |          |        |          |        |          |        |        |          |        |          |        |
|                  | Jumbo/KA   | 0.0034 |  |     |             |        |       |          |        |          |        |       |          |        |       |          |        |       |          |        |          |        |          |        |          |        |        |          |        |          |        |

|                                    |   |          |        |          |        |              |        |
|------------------------------------|---|----------|--------|----------|--------|--------------|--------|
|                                    | <table><tr><td>Jumbo/KL</td><td>0.0035</td></tr><tr><td>Smart/MH</td><td>0.0036</td></tr><tr><td>Powergram/TN</td><td>0.0033</td></tr></table>  | Jumbo/KL | 0.0035 | Smart/MH | 0.0036 | Powergram/TN | 0.0033 |
| Jumbo/KL                           | 0.0035  |          |        |          |        |              |        |
| Smart/MH                           | 0.0036  |          |        |          |        |              |        |
| Powergram/TN                       | 0.0033  |          |        |          |        |              |        |
| Measurement methods and procedures | Project KPT has been conducted  |          |        |          |        |              |        |
| Monitoring frequency               | Updated every two years   |          |        |          |        |              |        |
| QA/QC procedures                   | <p>CME has provided guidance and training to enumerators/experts for conducting KPTs to meet specific requirement of the methodology. The equipment used for testing is externally calibrated or newly purchased at the time of use so measurements are done with the necessary guarantees. Calibration of the equipment is done annually.</p> <p>Type – Digital Moisture Meter<br/>Accuracy Class - +/- 1%<br/>Serial number – TM361471, TM391454, TM28591, TM300144, TM400178, TM316542<br/>Calibration frequency – Annual<br/>Date of calibration – 27/02/2023<br/>Validity – Until 26/02/2024</p> <p>Type - Weighing Scale<br/>Accuracy Class - +/- 0.5 grams<br/>Serial number – WS010051, WS010052, WS010053, WS01495, WS010054<br/>Calibration frequency – Annual<br/>Date of calibration – 19/02/2023<br/>Validity – Until 18/02/2024</p> |          |        |          |        |              |        |
| Purpose of data                    | To calculate baseline emissions   |          |        |          |        |              |        |
| Additional comment                 | Project fuel consumption using KPT has been conducted in Jan-Feb 2023 to take into account seasonal variation in wood consumption.  |          |        |          |        |              |        |
| 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                   | <b>VPA</b>  | <b>Model/State</b> | <b>Values</b> |
|                                    | VPA4  | Smart/KA           | 56%           |
|                                    | VPA7  | Smart/KA           | 57%           |
|                                    |   | Smart/CG           | 48%           |
|                                    |   | Smart/MP           | 56%           |
|                                    |   | Smart/TN           | 56%           |
|                                    | VPA02   | Smart/TN           | 52%           |
|                                    |   | Smart/KL           | 49%           |
|                                    | VPA03   | Smart/KL           | 54%           |
|                                    | VPA11   | Smart/KA           | 68%           |
| Jumbo/KA                           |   | 51%                |               |
| Jumbo/KL                           |   | 59%                |               |
| Smart/MH                           |   | 61%                |               |
| Powergram/TN                       |   | 57%                |               |
| Measurement methods and procedures | Sampling surveys (physical) has been conducted to record the continued operation of project devices.  |                    |               |
|                                    | The usage rate has been calculated for each age (simple random sampling to be applied as applicable)  |                    |               |
| Monitoring frequency               | Annual  |                    |               |
| QA/QC procedures                   | CME has provided guidance and training to enumerators for conducting surveys to meet specific requirement of the methodology, if any. The value obtained has been tested to determine if the desired precision was met.   |                    |               |
|                                    | 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. |
|--------------------|---|

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

| Data / Parameter | N <sub>p,y</sub>   |             |                  |                   |          |
|------------------|--|-------------|------------------|-------------------|----------|
| Unit             | Project technologies credited (Number)                                     |             |                  |                   |          |
| Description      | Technologies in the project Database for project scenario p through year y |             |                  |                   |          |
| Source of data   | Total sales record   |             |                  |                   |          |
| Value(s) applied | VPA  | Model/State | Installed active | Installed damaged | Days     |
|                  | VPA02  | Smart/TN    | 6911             | 1659              | 2522515  |
|                  |  | Smart/KL    | 18890            | 5516              | 6894850  |
|                  | VPA03  | Smart/KL    | 17,388           | 443               | 6346620  |
|                  | VPA4   | Smart/KA    | 27696            | 2241              | 10109040 |
|                  | VPA7   | Smart/KA    | 23,306           | 1031              | 8141690  |
|                  |  | Smart/CG    | 2,271            | 221               | 828915   |
|                  |  | Smart/MP    | 1,488            | 201               | 543120   |
| Smart/TN         |  | 837         | 140              | 305505            |          |



|                                    |   |       |          |         |    |      |  |          |     |     |        |  |          |       |     |         |  |          |      |     |         |  |              |       |     |        |
|------------------------------------|---|-------|----------|---------|----|------|--|----------|-----|-----|--------|--|----------|-------|-----|---------|--|----------|------|-----|---------|--|--------------|-------|-----|--------|
|                                    | <table><tr><td>VPA11</td><td>Smart/KA</td><td>15</td><td>19</td><td>8395</td></tr><tr><td></td><td>Jumbo/KA</td><td>383</td><td>172</td><td>144905</td></tr><tr><td></td><td>Jumbo/KL</td><td>4,409</td><td>541</td><td>1610015</td></tr><tr><td></td><td>Smart/MH</td><td>6881</td><td>472</td><td>2513390</td></tr><tr><td></td><td>Powergram/TN</td><td>1,101</td><td>227</td><td>405880</td></tr></table>   | VPA11 | Smart/KA | 15      | 19 | 8395 |  | Jumbo/KA | 383 | 172 | 144905 |  | Jumbo/KL | 4,409 | 541 | 1610015 |  | Smart/MH | 6881 | 472 | 2513390 |  | Powergram/TN | 1,101 | 227 | 405880 |
| VPA11                              | Smart/KA  | 15    | 19       | 8395    |    |      |  |          |     |     |        |  |          |       |     |         |  |          |      |     |         |  |              |       |     |        |
|                                    | Jumbo/KA  | 383   | 172      | 144905  |    |      |  |          |     |     |        |  |          |       |     |         |  |          |      |     |         |  |              |       |     |        |
|                                    | Jumbo/KL  | 4,409 | 541      | 1610015 |    |      |  |          |     |     |        |  |          |       |     |         |  |          |      |     |         |  |              |       |     |        |
|                                    | Smart/MH  | 6881  | 472      | 2513390 |    |      |  |          |     |     |        |  |          |       |     |         |  |          |      |     |         |  |              |       |     |        |
|                                    | Powergram/TN  | 1,101 | 227      | 405880  |    |      |  |          |     |     |        |  |          |       |     |         |  |          |      |     |         |  |              |       |     |        |
| Measurement methods and procedures | Number of stoves listed in the Monitoring Database  |       |          |         |    |      |  |          |     |     |        |  |          |       |     |         |  |          |      |     |         |  |              |       |     |        |
| Monitoring frequency               | Continuous  |       |          |         |    |      |  |          |     |     |        |  |          |       |     |         |  |          |      |     |         |  |              |       |     |        |
| QA/QC procedures                   | Values can be cross checked by sales records.   |       |          |         |    |      |  |          |     |     |        |  |          |       |     |         |  |          |      |     |         |  |              |       |     |        |
| Purpose of data                    | To calculate baseline emissions   |       |          |         |    |      |  |          |     |     |        |  |          |       |     |         |  |          |      |     |         |  |              |       |     |        |
| Additional comment                 | <p>For sampling and monitoring purposes, the end user database which is a subset of the number of installations reported in the QPR has been used.</p> <p>In addition to methodological requirement to calculate Usage Rate (which is used to discount the ERs), as part of QA/QC defined in the PoA-DD and VPA-DD, Annual monitoring is carried out to determine the servicing requirement of all the stoves in the PoA. Based on the results of this annual monitoring survey, individual stove status is marked as installed_active and installed_damaged. The status "installed_damaged" could reflect minor stove damage which does not affect the operational capability of the stove, but to be conservative the VPA does not claim emission reductions for stoves marked "installed_damaged". The ERs are adjusted accordingly (by accounting ERs only for stoves that are "installed active").</p> |       |          |         |    |      |  |          |     |     |        |  |          |       |     |         |  |          |      |     |         |  |              |       |     |        |

| Data / Parameter | LE <sub>p,y</sub>                                      |                      |        |
|------------------|--|----------------------|--------|
| Unit             | tCO <sub>2</sub> e per year                            |                      |        |
| Description      | Leakage in project scenario p during year y            |                      |        |
| Source of data   | Baseline and monitoring surveys for Leakage assessment |                      |        |
| Value(s) applied | VPA  | Model/State          | Values |
|                  | VPA02  | Smart/TN<br>Smart/KL | 0      |
|                  | VPA03  | Smart/KL             | 0      |
|                  | VPA4   | Smart/KA             | 0      |
|                  | VPA7   | Smart/KA<br>Smart/CG | 0<br>0 |

|                                    |                                       |              |   |
|------------------------------------|---------------------------------------|--------------|---|
|                                    |                                       | Smart/MP     | 0 |
|                                    |                                       | Smart/TN     | 0 |
|                                    | VPA11                                 | Smart/KA     | 0 |
|                                    |                                       | Jumbo/KA     | 0 |
|                                    |                                       | Jumbo/KL     | 0 |
|                                    |                                       | Smart/MH     | 0 |
|                                    |                                       | Powergram/TN | 0 |
| Measurement methods and procedures | Qualitative / quantitative assessment |              |   |
| Monitoring frequency               | Every two years                       |              |   |
| QA/QC procedures                   | N.A.                                  |              |   |
| Purpose of data                    | For calculation of leakage emissions  |              |   |
| Additional comment                 | -                                     |              |   |

### Solar Lighting System

VPA 02-GS 11474

#### SDG 13

| Data / Parameter | N <sub>i,j</sub>   |                |  |      |       |             |      |        |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |        |                |   |              |  |                |
|------------------|--|----------------|--|------|-------|-------------|------|--------|-------|------|--------|--------|------------|-------|-------------|-------|--------------|-------|----------------|-------|------|--------|--------|------------|-------|-------------|-------|--------------|-------|----------------|-------|------|--------|--------|------------|--------|----------------|---|--------------|--|----------------|
| Unit             | Number   |                |  |      |       |             |      |        |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |        |                |   |              |  |                |
| Description      | Number of project lamps distributed to end users of type i with charging method j  |                |  |      |       |             |      |        |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |        |                |   |              |  |                |
| Source of data   | MEC tracker platform   |                |  |      |       |             |      |        |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |        |                |   |              |  |                |
| Value(s) applied | <table><tr><th>Year</th><th>State</th><th>Total Lamps</th></tr><tr><td>2013</td><td>Kerala</td><td>3,699</td></tr><tr><td rowspan="5">2014</td><td>Kerala</td><td>18,119</td></tr><tr><td>Tamil Nadu</td><td>7,622</td></tr><tr><td>Maharashtra</td><td>1,735</td></tr><tr><td>Chhattisgarh</td><td>2,154</td></tr><tr><td>Madhya Pradesh</td><td>1,089</td></tr><tr><td rowspan="5">2015</td><td>Kerala</td><td>46,747</td></tr><tr><td>Tamil Nadu</td><td>3,736</td></tr><tr><td>Maharashtra</td><td>2,608</td></tr><tr><td>Chhattisgarh</td><td>1,737</td></tr><tr><td>Madhya Pradesh</td><td>1,598</td></tr><tr><td rowspan="3">2016</td><td>Kerala</td><td>43,124</td></tr><tr><td>Tamil Nadu</td><td>11,416</td></tr><tr><td>Madhya Pradesh</td><td>2</td></tr><tr><td colspan="2"><b>Total</b></td><td><b>145,386</b></td></tr></table> |                |  | Year | State | Total Lamps | 2013 | Kerala | 3,699 | 2014 | Kerala | 18,119 | Tamil Nadu | 7,622 | Maharashtra | 1,735 | Chhattisgarh | 2,154 | Madhya Pradesh | 1,089 | 2015 | Kerala | 46,747 | Tamil Nadu | 3,736 | Maharashtra | 2,608 | Chhattisgarh | 1,737 | Madhya Pradesh | 1,598 | 2016 | Kerala | 43,124 | Tamil Nadu | 11,416 | Madhya Pradesh | 2 | <b>Total</b> |  | <b>145,386</b> |
| Year             | State  | Total Lamps    |  |      |       |             |      |        |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |        |                |   |              |  |                |
| 2013             | Kerala   | 3,699          |  |      |       |             |      |        |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |        |                |   |              |  |                |
| 2014             | Kerala   | 18,119         |  |      |       |             |      |        |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |        |                |   |              |  |                |
|                  | Tamil Nadu   | 7,622          |  |      |       |             |      |        |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |        |                |   |              |  |                |
|                  | Maharashtra  | 1,735          |  |      |       |             |      |        |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |        |                |   |              |  |                |
|                  | Chhattisgarh   | 2,154          |  |      |       |             |      |        |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |        |                |   |              |  |                |
|                  | Madhya Pradesh   | 1,089          |  |      |       |             |      |        |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |        |                |   |              |  |                |
| 2015             | Kerala   | 46,747         |  |      |       |             |      |        |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |        |                |   |              |  |                |
|                  | Tamil Nadu   | 3,736          |  |      |       |             |      |        |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |        |                |   |              |  |                |
|                  | Maharashtra  | 2,608          |  |      |       |             |      |        |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |        |                |   |              |  |                |
|                  | Chhattisgarh   | 1,737          |  |      |       |             |      |        |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |        |                |   |              |  |                |
|                  | Madhya Pradesh   | 1,598          |  |      |       |             |      |        |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |        |                |   |              |  |                |
| 2016             | Kerala   | 43,124         |  |      |       |             |      |        |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |        |                |   |              |  |                |
|                  | Tamil Nadu   | 11,416         |  |      |       |             |      |        |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |        |                |   |              |  |                |
|                  | Madhya Pradesh   | 2              |  |      |       |             |      |        |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |        |                |   |              |  |                |
| <b>Total</b>     |  | <b>145,386</b> |  |      |       |             |      |        |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |       |             |       |              |       |                |       |      |        |        |            |        |                |   |              |  |                |

|                                    |   |
|------------------------------------|---|
| 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                 | -   |

|  |   |
|--|---|
| <b>Data/parameter</b>                                | <b>GF<sub>y</sub></b>                         |
| 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   |

|                               |  |
|-------------------------------|--|
| <b>Data/parameter</b>         | <b>DB<sub>y</sub></b>  |
| 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 | Methodology default value applied  |

|                               |                                   |
|-------------------------------|-----------------------------------|
| <b>methods and procedures</b> |                                   |
| <b>Purpose of data</b>        | Calculation of baseline emissions |
| <b>Additional comment</b>     | N/A                               |

| Data / Parameter                   | OF <sub>y,i,j</sub>  |                    |        |  |                   |       |                    |  |  |  |        |        |      |        |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |                |      |      |
|------------------------------------|--|--------------------|--------|--|-------------------|-------|--------------------|--|--|--|--------|--------|------|--------|-----|-----|------|--------|-----|-----|------|------------|-----|-----|------|-------------|-----|-----|------|--------------|-----|-----|------|----------------|-----|-----|------|--------|-----|-----|------|------------|-----|-----|------|-------------|-----|-----|------|--------------|-----|-----|------|----------------|-----|-----|------|--------|-----|-----|------|------------|-----|-----|------|----------------|------|------|
| Unit                               | Fraction   |                    |        |  |                   |       |                    |  |  |  |        |        |      |        |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |                |      |      |
| Description                        | The percentage of project lamps distributed to end users that are operating and in service   |                    |        |  |                   |       |                    |  |  |  |        |        |      |        |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |                |      |      |
| Source of data                     | -  |                    |        |  |                   |       |                    |  |  |  |        |        |      |        |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |                |      |      |
| Value(s) applied                   | <table><tr><th>Installation year</th><th>State</th><th colspan="2">Crediting Period 2</th></tr><tr><td></td><td></td><td>Year 2</td><td>Year 3</td></tr><tr><td>2013</td><td>Kerala</td><td>75%</td><td>75%</td></tr><tr><td>2014</td><td>Kerala</td><td>77%</td><td>77%</td></tr><tr><td>2014</td><td>Tamil Nadu</td><td>75%</td><td>75%</td></tr><tr><td>2014</td><td>Maharashtra</td><td>76%</td><td>76%</td></tr><tr><td>2014</td><td>Chhattisgarh</td><td>75%</td><td>75%</td></tr><tr><td>2014</td><td>Madhya Pradesh</td><td>75%</td><td>75%</td></tr><tr><td>2015</td><td>Kerala</td><td>78%</td><td>78%</td></tr><tr><td>2015</td><td>Tamil Nadu</td><td>76%</td><td>76%</td></tr><tr><td>2015</td><td>Maharashtra</td><td>75%</td><td>75%</td></tr><tr><td>2015</td><td>Chhattisgarh</td><td>75%</td><td>75%</td></tr><tr><td>2015</td><td>Madhya Pradesh</td><td>75%</td><td>75%</td></tr><tr><td>2016</td><td>Kerala</td><td>80%</td><td>80%</td></tr><tr><td>2016</td><td>Tamil Nadu</td><td>77%</td><td>77%</td></tr><tr><td>2016</td><td>Madhya Pradesh</td><td>100%</td><td>100%</td></tr></table> |                    |        |  | Installation year | State | Crediting Period 2 |  |  |  | Year 2 | Year 3 | 2013 | Kerala | 75% | 75% | 2014 | Kerala | 77% | 77% | 2014 | Tamil Nadu | 75% | 75% | 2014 | Maharashtra | 76% | 76% | 2014 | Chhattisgarh | 75% | 75% | 2014 | Madhya Pradesh | 75% | 75% | 2015 | Kerala | 78% | 78% | 2015 | Tamil Nadu | 76% | 76% | 2015 | Maharashtra | 75% | 75% | 2015 | Chhattisgarh | 75% | 75% | 2015 | Madhya Pradesh | 75% | 75% | 2016 | Kerala | 80% | 80% | 2016 | Tamil Nadu | 77% | 77% | 2016 | Madhya Pradesh | 100% | 100% |
| Installation year                  | State  | Crediting Period 2 |        |  |                   |       |                    |  |  |  |        |        |      |        |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |                |      |      |
|                                    |  | Year 2             | Year 3 |  |                   |       |                    |  |  |  |        |        |      |        |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |                |      |      |
| 2013                               | Kerala   | 75%                | 75%    |  |                   |       |                    |  |  |  |        |        |      |        |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |                |      |      |
| 2014                               | Kerala   | 77%                | 77%    |  |                   |       |                    |  |  |  |        |        |      |        |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |                |      |      |
| 2014                               | Tamil Nadu   | 75%                | 75%    |  |                   |       |                    |  |  |  |        |        |      |        |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |                |      |      |
| 2014                               | Maharashtra  | 76%                | 76%    |  |                   |       |                    |  |  |  |        |        |      |        |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |                |      |      |
| 2014                               | Chhattisgarh   | 75%                | 75%    |  |                   |       |                    |  |  |  |        |        |      |        |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |                |      |      |
| 2014                               | Madhya Pradesh   | 75%                | 75%    |  |                   |       |                    |  |  |  |        |        |      |        |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |                |      |      |
| 2015                               | Kerala   | 78%                | 78%    |  |                   |       |                    |  |  |  |        |        |      |        |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |                |      |      |
| 2015                               | Tamil Nadu   | 76%                | 76%    |  |                   |       |                    |  |  |  |        |        |      |        |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |                |      |      |
| 2015                               | Maharashtra  | 75%                | 75%    |  |                   |       |                    |  |  |  |        |        |      |        |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |                |      |      |
| 2015                               | Chhattisgarh   | 75%                | 75%    |  |                   |       |                    |  |  |  |        |        |      |        |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |                |      |      |
| 2015                               | Madhya Pradesh   | 75%                | 75%    |  |                   |       |                    |  |  |  |        |        |      |        |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |                |      |      |
| 2016                               | Kerala   | 80%                | 80%    |  |                   |       |                    |  |  |  |        |        |      |        |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |                |      |      |
| 2016                               | Tamil Nadu   | 77%                | 77%    |  |                   |       |                    |  |  |  |        |        |      |        |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |                |      |      |
| 2016                               | Madhya Pradesh   | 100%               | 100%   |  |                   |       |                    |  |  |  |        |        |      |        |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |             |     |     |      |              |     |     |      |                |     |     |      |        |     |     |      |            |     |     |      |                |      |      |
| 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   | -   |

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**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 platform   |             |       |             |      |         |      |           |      |                |     |             |      |        |       |               |     |        |     |            |       |            |     |      |             |      |        |      |            |     |      |        |      |            |       |              |  |        |
| Value(s) applied                   | <table><tr><th>Year</th><th>State</th><th>Total Lamps</th></tr><tr><td rowspan="9">2016</td><td>Gujarat</td><td>2081</td></tr><tr><td>Karnataka</td><td>3707</td></tr><tr><td>Madhya Pradesh</td><td>482</td></tr><tr><td>Maharashtra</td><td>1529</td></tr><tr><td>Kerala</td><td>45028</td></tr><tr><td>Uttar Pradesh</td><td>133</td></tr><tr><td>Odisha</td><td>457</td></tr><tr><td>Tamil Nadu</td><td>32053</td></tr><tr><td>Puducherry</td><td>930</td></tr><tr><td rowspan="3">2017</td><td>Maharashtra</td><td>2081</td></tr><tr><td>Kerala</td><td>3707</td></tr><tr><td>Tamil Nadu</td><td>482</td></tr><tr><td rowspan="2">2018</td><td>Kerala</td><td>1529</td></tr><tr><td>Tamil Nadu</td><td>45028</td></tr><tr><td colspan="2"><i>Total</i></td><td>86,400</td></tr></table> | Year        | State | Total Lamps | 2016 | Gujarat | 2081 | Karnataka | 3707 | Madhya Pradesh | 482 | Maharashtra | 1529 | Kerala | 45028 | Uttar Pradesh | 133 | Odisha | 457 | Tamil Nadu | 32053 | Puducherry | 930 | 2017 | Maharashtra | 2081 | Kerala | 3707 | Tamil Nadu | 482 | 2018 | Kerala | 1529 | Tamil Nadu | 45028 | <i>Total</i> |  | 86,400 |
| Year                               | State  | Total Lamps |       |             |      |         |      |           |      |                |     |             |      |        |       |               |     |        |     |            |       |            |     |      |             |      |        |      |            |     |      |        |      |            |       |              |  |        |
| 2016                               | Gujarat  | 2081        |       |             |      |         |      |           |      |                |     |             |      |        |       |               |     |        |     |            |       |            |     |      |             |      |        |      |            |     |      |        |      |            |       |              |  |        |
|                                    | Karnataka  | 3707        |       |             |      |         |      |           |      |                |     |             |      |        |       |               |     |        |     |            |       |            |     |      |             |      |        |      |            |     |      |        |      |            |       |              |  |        |
|                                    | Madhya Pradesh   | 482         |       |             |      |         |      |           |      |                |     |             |      |        |       |               |     |        |     |            |       |            |     |      |             |      |        |      |            |     |      |        |      |            |       |              |  |        |
|                                    | Maharashtra  | 1529        |       |             |      |         |      |           |      |                |     |             |      |        |       |               |     |        |     |            |       |            |     |      |             |      |        |      |            |     |      |        |      |            |       |              |  |        |
|                                    | Kerala   | 45028       |       |             |      |         |      |           |      |                |     |             |      |        |       |               |     |        |     |            |       |            |     |      |             |      |        |      |            |     |      |        |      |            |       |              |  |        |
|                                    | Uttar Pradesh  | 133         |       |             |      |         |      |           |      |                |     |             |      |        |       |               |     |        |     |            |       |            |     |      |             |      |        |      |            |     |      |        |      |            |       |              |  |        |
|                                    | Odisha   | 457         |       |             |      |         |      |           |      |                |     |             |      |        |       |               |     |        |     |            |       |            |     |      |             |      |        |      |            |     |      |        |      |            |       |              |  |        |
|                                    | Tamil Nadu   | 32053       |       |             |      |         |      |           |      |                |     |             |      |        |       |               |     |        |     |            |       |            |     |      |             |      |        |      |            |     |      |        |      |            |       |              |  |        |
|                                    | Puducherry   | 930         |       |             |      |         |      |           |      |                |     |             |      |        |       |               |     |        |     |            |       |            |     |      |             |      |        |      |            |     |      |        |      |            |       |              |  |        |
| 2017                               | Maharashtra  | 2081        |       |             |      |         |      |           |      |                |     |             |      |        |       |               |     |        |     |            |       |            |     |      |             |      |        |      |            |     |      |        |      |            |       |              |  |        |
|                                    | Kerala   | 3707        |       |             |      |         |      |           |      |                |     |             |      |        |       |               |     |        |     |            |       |            |     |      |             |      |        |      |            |     |      |        |      |            |       |              |  |        |
|                                    | Tamil Nadu   | 482         |       |             |      |         |      |           |      |                |     |             |      |        |       |               |     |        |     |            |       |            |     |      |             |      |        |      |            |     |      |        |      |            |       |              |  |        |
| 2018                               | Kerala   | 1529        |       |             |      |         |      |           |      |                |     |             |      |        |       |               |     |        |     |            |       |            |     |      |             |      |        |      |            |     |      |        |      |            |       |              |  |        |
|                                    | Tamil Nadu   | 45028       |       |             |      |         |      |           |      |                |     |             |      |        |       |               |     |        |     |            |       |            |     |      |             |      |        |      |            |     |      |        |      |            |       |              |  |        |
| <i>Total</i>                       |  | 86,400      |       |             |      |         |      |           |      |                |     |             |      |        |       |               |     |        |     |            |       |            |     |      |             |      |        |      |            |     |      |        |      |            |       |              |  |        |
| 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 | -  |

|  |   |
|--|---|
| <b>Data/parameter</b>                                | <b>GF<sub>y</sub></b>                         |
| 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   |

|  |  |
|--|--|
| <b>Data/parameter</b>                                | <b>DB<sub>y</sub></b>  |
| 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  |

|                         |                           |
|-------------------------|---------------------------|
| <b>Data / Parameter</b> | <b>OF<sub>y,i,j</sub></b> |
|-------------------------|---------------------------|

| Unit                               | Fraction  |                    |        |  |                   |       |                    |  |  |  |        |        |      |         |     |     |      |           |     |     |      |                |     |     |      |             |     |     |      |        |     |     |      |               |     |     |      |        |     |     |      |            |     |     |      |            |     |     |      |             |      |      |      |        |     |     |      |            |     |     |      |        |     |     |      |            |     |     |
|------------------------------------|---|--------------------|--------|--|-------------------|-------|--------------------|--|--|--|--------|--------|------|---------|-----|-----|------|-----------|-----|-----|------|----------------|-----|-----|------|-------------|-----|-----|------|--------|-----|-----|------|---------------|-----|-----|------|--------|-----|-----|------|------------|-----|-----|------|------------|-----|-----|------|-------------|------|------|------|--------|-----|-----|------|------------|-----|-----|------|--------|-----|-----|------|------------|-----|-----|
| Description                        | The percentage of project lamps distributed to end users that are operating and in service  |                    |        |  |                   |       |                    |  |  |  |        |        |      |         |     |     |      |           |     |     |      |                |     |     |      |             |     |     |      |        |     |     |      |               |     |     |      |        |     |     |      |            |     |     |      |            |     |     |      |             |      |      |      |        |     |     |      |            |     |     |      |        |     |     |      |            |     |     |
| Source of data                     | -   |                    |        |  |                   |       |                    |  |  |  |        |        |      |         |     |     |      |           |     |     |      |                |     |     |      |             |     |     |      |        |     |     |      |               |     |     |      |        |     |     |      |            |     |     |      |            |     |     |      |             |      |      |      |        |     |     |      |            |     |     |      |        |     |     |      |            |     |     |
| Value(s) applied                   | <table><tr><th>Installation year</th><th>State</th><th colspan="2">Crediting Period 2</th></tr><tr><td></td><td></td><th>Year 1</th><th>Year 2</th></tr><tr><td>2016</td><td>Gujarat</td><td>80%</td><td>80%</td></tr><tr><td>2016</td><td>Karnataka</td><td>80%</td><td>80%</td></tr><tr><td>2016</td><td>Madhya Pradesh</td><td>80%</td><td>80%</td></tr><tr><td>2016</td><td>Maharashtra</td><td>80%</td><td>80%</td></tr><tr><td>2016</td><td>Kerala</td><td>79%</td><td>79%</td></tr><tr><td>2016</td><td>Uttar Pradesh</td><td>80%</td><td>80%</td></tr><tr><td>2016</td><td>Odisha</td><td>82%</td><td>82%</td></tr><tr><td>2016</td><td>Tamil Nadu</td><td>78%</td><td>78%</td></tr><tr><td>2016</td><td>Puducherry</td><td>77%</td><td>77%</td></tr><tr><td>2017</td><td>Maharashtra</td><td>100%</td><td>100%</td></tr><tr><td>2017</td><td>Kerala</td><td>84%</td><td>84%</td></tr><tr><td>2017</td><td>Tamil Nadu</td><td>77%</td><td>77%</td></tr><tr><td>2018</td><td>Kerala</td><td>84%</td><td>84%</td></tr><tr><td>2018</td><td>Tamil Nadu</td><td>82%</td><td>82%</td></tr></table> |                    |        |  | Installation year | State | Crediting Period 2 |  |  |  | Year 1 | Year 2 | 2016 | Gujarat | 80% | 80% | 2016 | Karnataka | 80% | 80% | 2016 | Madhya Pradesh | 80% | 80% | 2016 | Maharashtra | 80% | 80% | 2016 | Kerala | 79% | 79% | 2016 | Uttar Pradesh | 80% | 80% | 2016 | Odisha | 82% | 82% | 2016 | Tamil Nadu | 78% | 78% | 2016 | Puducherry | 77% | 77% | 2017 | Maharashtra | 100% | 100% | 2017 | Kerala | 84% | 84% | 2017 | Tamil Nadu | 77% | 77% | 2018 | Kerala | 84% | 84% | 2018 | Tamil Nadu | 82% | 82% |
| Installation year                  | State   | Crediting Period 2 |        |  |                   |       |                    |  |  |  |        |        |      |         |     |     |      |           |     |     |      |                |     |     |      |             |     |     |      |        |     |     |      |               |     |     |      |        |     |     |      |            |     |     |      |            |     |     |      |             |      |      |      |        |     |     |      |            |     |     |      |        |     |     |      |            |     |     |
|                                    |   | Year 1             | Year 2 |  |                   |       |                    |  |  |  |        |        |      |         |     |     |      |           |     |     |      |                |     |     |      |             |     |     |      |        |     |     |      |               |     |     |      |        |     |     |      |            |     |     |      |            |     |     |      |             |      |      |      |        |     |     |      |            |     |     |      |        |     |     |      |            |     |     |
| 2016                               | Gujarat   | 80%                | 80%    |  |                   |       |                    |  |  |  |        |        |      |         |     |     |      |           |     |     |      |                |     |     |      |             |     |     |      |        |     |     |      |               |     |     |      |        |     |     |      |            |     |     |      |            |     |     |      |             |      |      |      |        |     |     |      |            |     |     |      |        |     |     |      |            |     |     |
| 2016                               | Karnataka   | 80%                | 80%    |  |                   |       |                    |  |  |  |        |        |      |         |     |     |      |           |     |     |      |                |     |     |      |             |     |     |      |        |     |     |      |               |     |     |      |        |     |     |      |            |     |     |      |            |     |     |      |             |      |      |      |        |     |     |      |            |     |     |      |        |     |     |      |            |     |     |
| 2016                               | Madhya Pradesh  | 80%                | 80%    |  |                   |       |                    |  |  |  |        |        |      |         |     |     |      |           |     |     |      |                |     |     |      |             |     |     |      |        |     |     |      |               |     |     |      |        |     |     |      |            |     |     |      |            |     |     |      |             |      |      |      |        |     |     |      |            |     |     |      |        |     |     |      |            |     |     |
| 2016                               | Maharashtra   | 80%                | 80%    |  |                   |       |                    |  |  |  |        |        |      |         |     |     |      |           |     |     |      |                |     |     |      |             |     |     |      |        |     |     |      |               |     |     |      |        |     |     |      |            |     |     |      |            |     |     |      |             |      |      |      |        |     |     |      |            |     |     |      |        |     |     |      |            |     |     |
| 2016                               | Kerala  | 79%                | 79%    |  |                   |       |                    |  |  |  |        |        |      |         |     |     |      |           |     |     |      |                |     |     |      |             |     |     |      |        |     |     |      |               |     |     |      |        |     |     |      |            |     |     |      |            |     |     |      |             |      |      |      |        |     |     |      |            |     |     |      |        |     |     |      |            |     |     |
| 2016                               | Uttar Pradesh   | 80%                | 80%    |  |                   |       |                    |  |  |  |        |        |      |         |     |     |      |           |     |     |      |                |     |     |      |             |     |     |      |        |     |     |      |               |     |     |      |        |     |     |      |            |     |     |      |            |     |     |      |             |      |      |      |        |     |     |      |            |     |     |      |        |     |     |      |            |     |     |
| 2016                               | Odisha  | 82%                | 82%    |  |                   |       |                    |  |  |  |        |        |      |         |     |     |      |           |     |     |      |                |     |     |      |             |     |     |      |        |     |     |      |               |     |     |      |        |     |     |      |            |     |     |      |            |     |     |      |             |      |      |      |        |     |     |      |            |     |     |      |        |     |     |      |            |     |     |
| 2016                               | Tamil Nadu  | 78%                | 78%    |  |                   |       |                    |  |  |  |        |        |      |         |     |     |      |           |     |     |      |                |     |     |      |             |     |     |      |        |     |     |      |               |     |     |      |        |     |     |      |            |     |     |      |            |     |     |      |             |      |      |      |        |     |     |      |            |     |     |      |        |     |     |      |            |     |     |
| 2016                               | Puducherry  | 77%                | 77%    |  |                   |       |                    |  |  |  |        |        |      |         |     |     |      |           |     |     |      |                |     |     |      |             |     |     |      |        |     |     |      |               |     |     |      |        |     |     |      |            |     |     |      |            |     |     |      |             |      |      |      |        |     |     |      |            |     |     |      |        |     |     |      |            |     |     |
| 2017                               | Maharashtra   | 100%               | 100%   |  |                   |       |                    |  |  |  |        |        |      |         |     |     |      |           |     |     |      |                |     |     |      |             |     |     |      |        |     |     |      |               |     |     |      |        |     |     |      |            |     |     |      |            |     |     |      |             |      |      |      |        |     |     |      |            |     |     |      |        |     |     |      |            |     |     |
| 2017                               | Kerala  | 84%                | 84%    |  |                   |       |                    |  |  |  |        |        |      |         |     |     |      |           |     |     |      |                |     |     |      |             |     |     |      |        |     |     |      |               |     |     |      |        |     |     |      |            |     |     |      |            |     |     |      |             |      |      |      |        |     |     |      |            |     |     |      |        |     |     |      |            |     |     |
| 2017                               | Tamil Nadu  | 77%                | 77%    |  |                   |       |                    |  |  |  |        |        |      |         |     |     |      |           |     |     |      |                |     |     |      |             |     |     |      |        |     |     |      |               |     |     |      |        |     |     |      |            |     |     |      |            |     |     |      |             |      |      |      |        |     |     |      |            |     |     |      |        |     |     |      |            |     |     |
| 2018                               | Kerala  | 84%                | 84%    |  |                   |       |                    |  |  |  |        |        |      |         |     |     |      |           |     |     |      |                |     |     |      |             |     |     |      |        |     |     |      |               |     |     |      |        |     |     |      |            |     |     |      |            |     |     |      |             |      |      |      |        |     |     |      |            |     |     |      |        |     |     |      |            |     |     |
| 2018                               | Tamil Nadu  | 82%                | 82%    |  |                   |       |                    |  |  |  |        |        |      |         |     |     |      |           |     |     |      |                |     |     |      |             |     |     |      |        |     |     |      |               |     |     |      |        |     |     |      |            |     |     |      |            |     |     |      |             |      |      |      |        |     |     |      |            |     |     |      |        |     |     |      |            |     |     |
| 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                 | -   |                    |        |  |                   |       |                    |  |  |  |        |        |      |         |     |     |      |           |     |     |      |                |     |     |      |             |     |     |      |        |     |     |      |               |     |     |      |        |     |     |      |            |     |     |      |            |     |     |      |             |      |      |      |        |     |     |      |            |     |     |      |        |     |     |      |            |     |     |

**Solar Lighting System**  
**VPA 04-GS 11476**  
**SDG 13**

|                         |                        |
|-------------------------|------------------------|
| <b>Data / Parameter</b> | <b>N<sub>i,j</sub></b> |
|-------------------------|------------------------|

| Unit                               | Number   |             |  |      |       |             |      |           |       |      |           |        |      |           |        |      |           |        |       |  |        |
|------------------------------------|--|-------------|--|------|-------|-------------|------|-----------|-------|------|-----------|--------|------|-----------|--------|------|-----------|--------|-------|--|--------|
| Description                        | Number of project lamps distributed to end users of type i with charging method j  |             |  |      |       |             |      |           |       |      |           |        |      |           |        |      |           |        |       |  |        |
| Source of data                     | MEC tracker platform   |             |  |      |       |             |      |           |       |      |           |        |      |           |        |      |           |        |       |  |        |
| Value(s) applied                   | <table><tr><th>Year</th><th>State</th><th>Total Lamps</th></tr><tr><td>2013</td><td>Karnataka</td><td>7,342</td></tr><tr><td>2014</td><td>Karnataka</td><td>10,341</td></tr><tr><td>2015</td><td>Karnataka</td><td>24,660</td></tr><tr><td>2016</td><td>Karnataka</td><td>13,999</td></tr><tr><td colspan="2">Total</td><td>56,342</td></tr></table> |             |  | Year | State | Total Lamps | 2013 | Karnataka | 7,342 | 2014 | Karnataka | 10,341 | 2015 | Karnataka | 24,660 | 2016 | Karnataka | 13,999 | Total |  | 56,342 |
| Year                               | State  | Total Lamps |  |      |       |             |      |           |       |      |           |        |      |           |        |      |           |        |       |  |        |
| 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 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                 | -  |             |  |      |       |             |      |           |       |      |           |        |      |           |        |      |           |        |       |  |        |

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



| Data/parameter                                       | DB <sub>y</sub>  |
|--|--|
| 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 <sub>y,i,j</sub>   |        |  |                   |                    |  |  |        |        |      |    |    |      |    |    |      |     |     |      |     |     |
|------------------------------------|---|--------|--|-------------------|--------------------|--|--|--------|--------|------|----|----|------|----|----|------|-----|-----|------|-----|-----|
| Unit                               | Fraction  |        |  |                   |                    |  |  |        |        |      |    |    |      |    |    |      |     |     |      |     |     |
| Description                        | The percentage of project lamps distributed to end users that are operating and in service  |        |  |                   |                    |  |  |        |        |      |    |    |      |    |    |      |     |     |      |     |     |
| Source of data                     | -   |        |  |                   |                    |  |  |        |        |      |    |    |      |    |    |      |     |     |      |     |     |
| Value(s) applied                   | <table><tr><th>Installation year</th><th colspan="2">Crediting Period 2</th></tr><tr><td></td><th>Year 2</th><th>Year 3</th></tr><tr><td>2013</td><td>0%</td><td>0%</td></tr><tr><td>2014</td><td>0%</td><td>0%</td></tr><tr><td>2015</td><td>69%</td><td>69%</td></tr><tr><td>2016</td><td>72%</td><td>72%</td></tr></table> |        |  | Installation year | Crediting Period 2 |  |  | Year 2 | Year 3 | 2013 | 0% | 0% | 2014 | 0% | 0% | 2015 | 69% | 69% | 2016 | 72% | 72% |
| Installation year                  | Crediting Period 2  |        |  |                   |                    |  |  |        |        |      |    |    |      |    |    |      |     |     |      |     |     |
|                                    | Year 2  | Year 3 |  |                   |                    |  |  |        |        |      |    |    |      |    |    |      |     |     |      |     |     |
| 2013                               | 0%  | 0%     |  |                   |                    |  |  |        |        |      |    |    |      |    |    |      |     |     |      |     |     |
| 2014                               | 0%  | 0%     |  |                   |                    |  |  |        |        |      |    |    |      |    |    |      |     |     |      |     |     |
| 2015                               | 69%   | 69%    |  |                   |                    |  |  |        |        |      |    |    |      |    |    |      |     |     |      |     |     |
| 2016                               | 72%   | 72%    |  |                   |                    |  |  |        |        |      |    |    |      |    |    |      |     |     |      |     |     |
| 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 07-GS 11477**

| Data / Parameter                   | N <sub>i,j</sub>   |             |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
|------------------------------------|--|-------------|--|------|-------|-------------|------|-----------|-------|-------|------|-------|------|-----------|-----|--------|-----|-------------|----|---------------|-----|------|-----------|-------|-------|------|-------|------|-----------|-----|--------|-----|---------|-----|-------------|----|------|-----------|-------|-------|------|-------|------|-----------|-----|--------|-----|---------|-----|-------------|----|-------|--|---------|
| Unit                               | Number   |             |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
| Description                        | Number of project lamps distributed to end users of type i with charging method j  |             |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
| Source of data                     | MEC tracker platform   |             |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
| Value(s) applied                   | <table><tr><th>Year</th><th>State</th><th>Total Lamps</th></tr><tr><td rowspan="7">2017</td><td>Karnataka</td><td>26484</td></tr><tr><td>Assam</td><td>4106</td></tr><tr><td>Bihar</td><td>2553</td></tr><tr><td>Jharkhand</td><td>321</td></tr><tr><td>Odisha</td><td>394</td></tr><tr><td>West Bengal</td><td>48</td></tr><tr><td>Uttar Pradesh</td><td>103</td></tr><tr><td rowspan="7">2018</td><td>Karnataka</td><td>49763</td></tr><tr><td>Assam</td><td>4647</td></tr><tr><td>Bihar</td><td>2431</td></tr><tr><td>Jharkhand</td><td>585</td></tr><tr><td>Odisha</td><td>599</td></tr><tr><td>Tripura</td><td>867</td></tr><tr><td>West Bengal</td><td>20</td></tr><tr><td rowspan="7">2019</td><td>Karnataka</td><td>28691</td></tr><tr><td>Assam</td><td>2251</td></tr><tr><td>Bihar</td><td>1325</td></tr><tr><td>Jharkhand</td><td>238</td></tr><tr><td>Odisha</td><td>207</td></tr><tr><td>Tripura</td><td>481</td></tr><tr><td>West Bengal</td><td>26</td></tr><tr><td colspan="2">Total</td><td>126,504</td></tr></table> |             |  | Year | State | Total Lamps | 2017 | Karnataka | 26484 | Assam | 4106 | Bihar | 2553 | Jharkhand | 321 | Odisha | 394 | West Bengal | 48 | Uttar Pradesh | 103 | 2018 | Karnataka | 49763 | Assam | 4647 | Bihar | 2431 | Jharkhand | 585 | Odisha | 599 | Tripura | 867 | West Bengal | 20 | 2019 | Karnataka | 28691 | Assam | 2251 | Bihar | 1325 | Jharkhand | 238 | Odisha | 207 | Tripura | 481 | West Bengal | 26 | Total |  | 126,504 |
| Year                               | State  | Total Lamps |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
| 2017                               | Karnataka  | 26484       |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
|                                    | Assam  | 4106        |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
|                                    | Bihar  | 2553        |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
|                                    | Jharkhand  | 321         |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
|                                    | Odisha   | 394         |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
|                                    | West Bengal  | 48          |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
|                                    | Uttar Pradesh  | 103         |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
| 2018                               | Karnataka  | 49763       |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
|                                    | Assam  | 4647        |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
|                                    | Bihar  | 2431        |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
|                                    | Jharkhand  | 585         |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
|                                    | Odisha   | 599         |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
|                                    | Tripura  | 867         |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
|                                    | West Bengal  | 20          |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
| 2019                               | Karnataka  | 28691       |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
|                                    | Assam  | 2251        |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
|                                    | Bihar  | 1325        |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
|                                    | Jharkhand  | 238         |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
|                                    | Odisha   | 207         |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
|                                    | Tripura  | 481         |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
|                                    | West Bengal  | 26          |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
| Total                              |  | 126,504     |  |      |       |             |      |           |       |       |      |       |      |           |     |        |     |             |    |               |     |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |      |           |       |       |      |       |      |           |     |        |     |         |     |             |    |       |  |         |
| 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 | -  |

|  |   |
|--|---|
| <b>Data/parameter</b>                                | <b>GF<sub>y</sub></b>                         |
| 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   |

|  |  |
|--|--|
| <b>Data/parameter</b>                                | <b>DB<sub>y</sub></b>  |
| 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  |

|                         |                           |
|-------------------------|---------------------------|
| <b>Data / Parameter</b> | <b>OF<sub>y,i,j</sub></b> |
|-------------------------|---------------------------|

|                                    |  |               |                           |                  |
|------------------------------------|--|---------------|---------------------------|------------------|
| Unit                               | Fraction   |               |                           |                  |
| Description                        | The percentage of project lamps distributed to end users that are operating and in service   |               |                           |                  |
| Source of data                     | -  |               |                           |                  |
| Value(s) applied                   | <b>Installation year</b>   | <b>State</b>  | <b>Crediting Period 2</b> |                  |
|                                    |  |               | Operation Year 2          | Operation Year 3 |
|                                    | 2017   | Karnataka     | 70%                       | 70%              |
|                                    | 2017   | Assam         | 71%                       | 71%              |
|                                    | 2017   | Bihar         | 73%                       | 73%              |
|                                    | 2017   | Jharkhand     | 75%                       | 75%              |
|                                    | 2017   | Odisha        | 76%                       | 76%              |
|                                    | 2017   | West Bengal   | 75%                       | 75%              |
|                                    | 2017   | Uttar Pradesh | 82%                       | 82%              |
|                                    | 2018   | Karnataka     | 75%                       | 75%              |
|                                    | 2018   | Assam         | 74%                       | 74%              |
|                                    | 2018   | Bihar         | 80%                       | 80%              |
|                                    | 2018   | Jharkhand     | 83%                       | 83%              |
|                                    | 2018   | Odisha        | 80%                       | 80%              |
|                                    | 2018   | Tripura       | 81%                       | 81%              |
|                                    | 2018   | West Bengal   | 75%                       | 75%              |
|                                    | 2019   | Karnataka     | 77%                       | 77%              |
|                                    | 2019   | Assam         | 78%                       | 78%              |
|                                    | 2019   | Bihar         | 83%                       | 83%              |
|                                    | 2019   | Jharkhand     | 82%                       | 82%              |
|                                    | 2019   | Odisha        | 83%                       | 83%              |
|                                    | 2019   | Tripura       | 81%                       | 81%              |
| 2019                               | Uttar Pradesh  | 89%           | 89%                       |                  |
| 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                 | -  |               |                           |                  |

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| Data / Parameter                   | $N_{i,j}$   |             |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
|------------------------------------|---|-------------|-------|-------------|------|-----------|-------|--------|--------|-------------|-------|------------|--------|------|-----------|--------|--------|--------|---------|-------|----------------|-----|-------------|-------|--------|----|------------|--------|---------------|-----|------|-----------|-------|--------|--------|---------|-------|----------------|-----|-------------|----|--------|-------|------------|--------|-------|--|---------|
| Unit                               | Number  |             |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
| Description                        | Number of project lamps distributed to end users of type i with charging method j   |             |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
| Source of data                     | MEC tracker platform  |             |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
| Value(s) applied                   | <table><tr><th>Year</th><th>State</th><th>Total Lamps</th></tr><tr><td rowspan="4">2015</td><td>Karnataka</td><td>9,177</td></tr><tr><td>Kerala</td><td>50,375</td></tr><tr><td>Maharashtra</td><td>9,940</td></tr><tr><td>Tamil Nadu</td><td>26,883</td></tr><tr><td rowspan="8">2016</td><td>Karnataka</td><td>10,819</td></tr><tr><td>Kerala</td><td>39,162</td></tr><tr><td>Gujarat</td><td>3,246</td></tr><tr><td>Madhya Pradesh</td><td>293</td></tr><tr><td>Maharashtra</td><td>8,053</td></tr><tr><td>Odisha</td><td>15</td></tr><tr><td>Tamil Nadu</td><td>45,325</td></tr><tr><td>Uttar Pradesh</td><td>188</td></tr><tr><td rowspan="7">2017</td><td>Karnataka</td><td>5,598</td></tr><tr><td>Kerala</td><td>11,783</td></tr><tr><td>Gujarat</td><td>1,875</td></tr><tr><td>Madhya Pradesh</td><td>380</td></tr><tr><td>Maharashtra</td><td>19</td></tr><tr><td>Odisha</td><td>2,405</td></tr><tr><td>Tamil Nadu</td><td>17,052</td></tr><tr><td colspan="2">Total</td><td>242,588</td></tr></table> | Year        | State | Total Lamps | 2015 | Karnataka | 9,177 | Kerala | 50,375 | Maharashtra | 9,940 | Tamil Nadu | 26,883 | 2016 | Karnataka | 10,819 | Kerala | 39,162 | Gujarat | 3,246 | Madhya Pradesh | 293 | Maharashtra | 8,053 | Odisha | 15 | Tamil Nadu | 45,325 | Uttar Pradesh | 188 | 2017 | Karnataka | 5,598 | Kerala | 11,783 | Gujarat | 1,875 | Madhya Pradesh | 380 | Maharashtra | 19 | Odisha | 2,405 | Tamil Nadu | 17,052 | Total |  | 242,588 |
| Year                               | State   | Total Lamps |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
| 2015                               | Karnataka   | 9,177       |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
|                                    | Kerala  | 50,375      |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
|                                    | Maharashtra   | 9,940       |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
|                                    | Tamil Nadu  | 26,883      |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
| 2016                               | Karnataka   | 10,819      |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
|                                    | Kerala  | 39,162      |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
|                                    | Gujarat   | 3,246       |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
|                                    | Madhya Pradesh  | 293         |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
|                                    | Maharashtra   | 8,053       |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
|                                    | Odisha  | 15          |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
|                                    | Tamil Nadu  | 45,325      |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
|                                    | Uttar Pradesh   | 188         |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
| 2017                               | Karnataka   | 5,598       |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
|                                    | Kerala  | 11,783      |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
|                                    | Gujarat   | 1,875       |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
|                                    | Madhya Pradesh  | 380         |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
|                                    | Maharashtra   | 19          |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
|                                    | Odisha  | 2,405       |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
|                                    | Tamil Nadu  | 17,052      |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
| Total                              |   | 242,588     |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
| Measurement methods and procedures | The data has been recorded in a web based tracker platform. The data consists of unique number, number of units sold, to whom and where   |             |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
| Monitoring frequency               | Annual  |             |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
| QA/QC procedures                   | Each solar lighting system, and number of solar lamps in each system, has been recorded in the MEC Tracker System. Associated data resides in the MEC Tracker Database, allowing each installation to be monitored.   |             |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
| Purpose of data                    | Calculation of project emissions  |             |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |
| Additional comment                 | -   |             |       |             |      |           |       |        |        |             |       |            |        |      |           |        |        |        |         |       |                |     |             |       |        |    |            |        |               |     |      |           |       |        |        |         |       |                |     |             |    |        |       |            |        |       |  |         |

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

| Data/parameter                                       | DB <sub>y</sub>  |
|--|--|
| 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 <sub>y,i,j</sub>  |
|------------------|--|
| Unit             | Fraction   |
| Description      | The percentage of project lamps distributed to end users that are operating and in service |

|                                    |  |                |                           |                  |
|------------------------------------|--|----------------|---------------------------|------------------|
| Source of data                     | -  |                |                           |                  |
| Value(s) applied                   | <b>Installation year</b>   | <b>State</b>   | <b>Crediting Period 2</b> |                  |
|                                    |  |                | Operation Year 2          | Operation Year 3 |
|                                    | 2015   | Karnataka      | 70%                       | 70%              |
|                                    | 2016   | Karnataka      | 75%                       | 75%              |
|                                    | 2017   | Karnataka      | 78%                       | 78%              |
|                                    | 2015   | Kerala         | 72%                       | 72%              |
|                                    | 2016   | Kerala         | 72%                       | 72%              |
|                                    | 2017   | Kerala         | 74%                       | 74%              |
|                                    | 2016   | Gujarat        | 72%                       | 72%              |
|                                    | 2017   | Gujarat        | 73%                       | 73%              |
|                                    | 2016   | Madhya Pradesh | 76%                       | 76%              |
|                                    | 2017   | Madhya Pradesh | 75%                       | 75%              |
|                                    | 2015   | Maharashtra    | 75%                       | 75%              |
|                                    | 2016   | Maharashtra    | 77%                       | 77%              |
|                                    | 2017   | Maharashtra    | 79%                       | 79%              |
|                                    | 2016   | Odisha         | 80%                       | 80%              |
|                                    | 2017   | Odisha         | 80%                       | 80%              |
|                                    | 2015   | Tamil Nadu     | 70%                       | 70%              |
|                                    | 2016   | Tamil Nadu     | 78%                       | 78%              |
|                                    | 2017   | Tamil Nadu     | 78%                       | 78%              |
| 2016                               | Uttar Pradesh  | 66%            | 66%                       |                  |
| 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                 | -  |                |                           |                  |

**SDG 7**

|                  |            |
|------------------|------------|
| Data / Parameter | ACSProject |
|------------------|------------|

|                                    |   |            |            |
|------------------------------------|---|------------|------------|
| Unit                               | Number  |            |            |
| Description                        | Number of households having operational clean energy technology   |            |            |
| Source of data                     | ICS/SLS distribution records  |            |            |
| Value(s) applied                   | <b>VPA</b>  | <b>ICS</b> | <b>SLS</b> |
|                                    | VPA2  | 16,357     | 94273      |
|                                    | VPA 3   | 9600       | 63562      |
|                                    | VPA4  | 16,821     | 8376       |
|                                    | VPA 7   | 16008      | 35061      |
|                                    | VPA11   | 8,474      | 179952     |
| Measurement methods and procedures | Monitor the number of ICS/SLS distributed under the project as an indicator of providing reliable, clean and modern technology (relative to baseline stoves). |            |            |
| Monitoring frequency               | Continuous  |            |            |
| QA/QC procedures                   | -   |            |            |
| Purpose of data                    | SDG 7 contribution  |            |            |
| Additional comment                 | -   |            |            |

## SDG 8

| Data / Parameter                   | QE IGproject   |      |  |     |        |      |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |
|------------------------------------|--|------|--|-----|--------|------|-------|---|----|-------|---|----|-------|---|----|-------|---|----|-------|---|----|
| Unit                               | Number   |      |  |     |        |      |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |
| Description                        | Quantitative Employment and income generation  |      |  |     |        |      |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |
| Source of data                     | Employment records   |      |  |     |        |      |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |
| Value(s) applied                   | <table><tr><th>VPA</th><th>Female</th><th>Male</th></tr><tr><td>VPA 2</td><td>3</td><td>20</td></tr><tr><td>VPA 3</td><td>3</td><td>40</td></tr><tr><td>VPA 4</td><td>1</td><td>29</td></tr><tr><td>VPA 7</td><td>6</td><td>54</td></tr><tr><td>VPA11</td><td>3</td><td>45</td></tr></table> |      |  | VPA | Female | Male | VPA 2 | 3 | 20 | VPA 3 | 3 | 40 | VPA 4 | 1 | 29 | VPA 7 | 6 | 54 | VPA11 | 3 | 45 |
| VPA                                | Female   | Male |  |     |        |      |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |
| VPA 2                              | 3  | 20   |  |     |        |      |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |
| VPA 3                              | 3  | 40   |  |     |        |      |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |
| VPA 4                              | 1  | 29   |  |     |        |      |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |
| VPA 7                              | 6  | 54   |  |     |        |      |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |
| VPA11                              | 3  | 45   |  |     |        |      |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |
| Measurement methods and procedures | Recording the number of employees (male / female) in the project under administrative, sales, production and management positions. Employment record with date of birth has been provided.   |      |  |     |        |      |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |
| Monitoring frequency               | Annually   |      |  |     |        |      |       |   |    |       |   |    |       |   |    |       |   |    |       |   |    |



|                  |                    |
|------------------|--------------------|
| QA/QC procedures | -                  |
| Purpose of data  | SDG 8 contribution |

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

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

| SDG          | Value obtained in this monitoring period |            | Value obtained last monitoring period |            |
|--------------|--|------------|---------------------------------------|------------|
| SDG 13 (ICS) | <b>VPA</b>                               | <b>ICS</b> | <b>VPA</b>                            | <b>ICS</b> |
|              | VPA 2                                    | 31236      | VPA 2                                 | 37,711     |
|              | VPA 3                                    | 25745      | VPA 3                                 | 26,037     |
|              | VPA 4                                    | 41509      | VPA 4                                 | 44,184     |
|              | VPA 7                                    | 43,664     | VPA 7                                 | 44,142     |
|              | VPA 11                                   | 21,605     | VPA 11                                | 22,180     |
|              |  |            |                                       |            |
| SDG 13 (SLS) | <b>VPA</b>                               | <b>SLS</b> | <b>VPA</b>                            | <b>SLS</b> |
|              | VPA 2                                    | 5875       | VPA 2                                 | 10,530     |
|              | VPA 3                                    | 6278       | VPA 3                                 | 6,345      |
|              | VPA 4                                    | 1587       | VPA 4                                 | 3,673      |
|              | VPA 7                                    | 8534       | VPA 7                                 | 8,670      |
|              | VPA 11                                   | 12415      | VPA 11                                | 16,577     |
|              |  |            |                                       |            |
| SDG 7 (ICS)  | <b>VPA</b>                               | <b>ICS</b> | <b>VPA</b>                            | <b>ICS</b> |
|              | VPA2                                     | 16357      | VPA 2                                 | 17,033     |
|              | VPA 3                                    | 9600       | VPA 3                                 | 9,707      |
|              | VPA4                                     | 16821      | VPA 4                                 | 17127      |
|              | VPA 7                                    | 16008      | VPA 7                                 | 17036      |
|              | VPA11                                    | 8,474      | VPA 11                                | 8,714      |
|              |  |            |                                       |            |
| SDG 7 (SLS)  | <b>VPA</b>                               | <b>SLS</b> | <b>VPA</b>                            | <b>SLS</b> |
|              | VPA2                                     | 94273      | VPA 2                                 | 96,848     |
|              | VPA 3                                    | 63562      | VPA 3                                 | 64,717     |
|              | VPA4                                     | 8376       | VPA 4                                 | 14,375     |
|              | VPA 7                                    | 35061      | VPA 7                                 | 35522      |
|              | VPA11                                    | 179955     | VPA 11                                | 183085     |
|              |  | 2          |                                       |            |

SDG 8

| VPA   | Total |
|-------|-------|
| VPA2  | 23    |
| VPA 3 | 43    |
| VPA4  | 30    |
| VPA 7 | 60    |
| VPA11 | 48    |

| VPA   | Total |
|-------|-------|
| VPA2  | 23    |
| VPA 3 | 43    |
| VPA4  | 30    |
| VPA 7 | 60    |
| VPA11 | 48    |

#### D.4. Implementation of sampling plan

>>

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

Sampling plan was applied to all the following VPAs included in this issuance request: VPA2, VPA3, VPA4, VPA7, VPA11 values considered.

#### Description of implemented sampling design

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

Solar Lighting System:

#### AMS III AR

The following steps were taken as part of the sampling procedure for VPA2, VPA3, VPA4, VPA7 and VPA 11 -

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 registered VPA-DD and TPDDTEC v3.1, the following sampling design was implemented for the VPA-

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

- **Usage Survey/Project Survey**

1. As per the requirement TPDDTEC v3.1, a minimum total sample size for Usage Survey is 100 with at least 30 samples for project technologies of each age being credited. For VPAs where there are multiple POs, states and models sampling has been done PO, model and state-wise.

- **Project KPT**

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

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

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

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

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

## 1. VPA2 GSID 11474

| Parameter             | Monitoring Frequency | CEPs added during this MP (01/01/2022 to 31/12/2022) | Previous monitoring dates | New Monitoring for this MP |
|-----------------------|----------------------|--|---------------------------|----------------------------|
| Usage Survey          | Annual               | No   | 06/01/2021 to 15/02/2021  | Yes                        |
| Project KPT           | Biennial             | No   | -                         | Yes                        |
| Solar Lighting System | Annual               | No   | 06/01/2021 to 10/02/2021  | Yes                        |

Improved Cookstoves: Considering usage survey is done annually, monitoring usage surveys for various parameters in this monitoring period was conducted in 06/01/2023 to 10/02/2023. Project KPT was conducted in the month of January/February 2023. 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 06/01/2022 to 16/02/2022 for solar lighting systems. Quarterly monitoring will be ongoing to determine the Lamp Failure Rate. For the next monitoring period fresh monitoring may be carried.

## 2. VPA3 GSID 11475

| Parameter             | Monitoring Frequency | CEPs added during this MP (01/01/2022 to 31/12/2022) | Previous monitoring dates | New Monitoring for this MP |
|-----------------------|----------------------|--|---------------------------|----------------------------|
| Usage Survey          | Annual               | No   | 06/01/2021 to 15/02/2021  | Yes                        |
| Project KPT           | Biennial             | No   | -                         | Yes                        |
| Solar Lighting System | Annual               | No   | 06/01/2021 to 10/02/2021  | Yes                        |

Improved Cookstoves: Considering usage survey is done annually, monitoring usage surveys for various parameters in this monitoring period was conducted in 06/01/2023 10/02/2023. Project KPT was conducted in the month of January/February 2023. 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 06/01/2022 to 16/02/2022 for solar lighting systems. Quarterly monitoring will be ongoing to determine the Lamp Failure Rate. For the next monitoring period fresh monitoring may be carried.

### 3. VPA4 GSID 11476

| Parameter             | Monitoring Frequency | CEPs added during this MP (01/01/2022 to 31/12/2022) | Previous monitoring dates | New Monitoring for this MP |
|-----------------------|----------------------|--|---------------------------|----------------------------|
| Usage Survey          | Annual               | No   | 06/01/2021 to 15/02/2021  | Yes                        |
| Project KPT           | Biennial             | No   | -                         | Yes                        |
| Solar Lighting System | Annual               | No   | 06/01/2021 to 10/02/2021  | Yes                        |

Improved Cookstoves: Considering usage survey is done annually, monitoring usage surveys for various parameters in this monitoring period was conducted in 06/01/2023 10/02/2023. Project KPT was conducted in the month of January/February 2023. 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 06/01/2022 to 16/02/2022 for solar lighting systems. Quarterly monitoring will be ongoing to determine the Lamp Failure Rate. For the next monitoring period fresh monitoring may be carried.

### 4. VPA7 GSID 11477

| Parameter | Monitoring Frequency | CEPs added during this MP (01/01/2022 to 31/12/2022) | Previous monitoring dates | New Monitoring for this MP |
|-----------|----------------------|--|---------------------------|----------------------------|
|           |                      |  |                           |                            |

|                       |          |    |                          |     |
|-----------------------|----------|----|--------------------------|-----|
| Usage Survey          | Annual   | No | 06/01/2021 to 15/02/2021 | Yes |
| Project KPT           | Biennial | No | -                        | Yes |
| Solar Lighting System | Annual   | No | 06/01/2021 to 10/02/2021 | Yes |

Improved Cookstoves: Considering usage survey is done annually, monitoring usage surveys for various parameters in this monitoring period was conducted in 06/01/2023 10/02/2023. Project KPT was conducted in the month of January/February 2023. 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 06/01/2022 to 16/02/2022 for solar lighting systems. Quarterly monitoring will be ongoing to determine the Lamp Failure Rate. For the next monitoring period fresh monitoring may be carried.

## 5. VPA11 GSID 11481

| Parameter             | Monitoring Frequency | CEPs added during this MP (01/01/2022 to 31/12/2022) | Previous monitoring dates | New Monitoring for this MP |
|-----------------------|----------------------|--|---------------------------|----------------------------|
| Usage Survey          | Annual               | No   | 06/01/2021 to 15/02/2021  | Yes                        |
| Project KPT           | Biennial             | No   | -                         | Yes                        |
| Solar Lighting System | Annual               | No   | 06/01/2021 to 10/02/2021  | Yes                        |

Improved Cookstoves: Considering usage survey is done annually, monitoring usage surveys for various parameters in this monitoring period was conducted in 06/01/2023 10/02/2023. Project KPT was conducted in the month of January/February 2023. 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 06/01/2022 to 16/02/2022 for solar lighting systems. Quarterly monitoring will be ongoing to determine the Lamp Failure Rate. For the next monitoring period fresh monitoring may be carried.

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

### 1. VPA2 GSID 11474

#### Improved Cookstoves (ESAF)

| S.No | Parameter   | Sampling approach   | Sample size |     |
|------|---|---|-------------|-----|
| 1    | Usage rate in project scenario p during year y ( $U_{p,y}$ )                        | Simple random sampling for proportion-based parameter           | State       | Y-1 |
|      |   |   | Smart TN    | 100 |
|      |   |   | Smart KL    | 122 |
| 2    | Quantity of fuel that is consumed in project scenario p during year y ( $P_{p,y}$ ) | Carry out KPTs- Simple random sampling for mean based parameter | 90          |     |

#### Solar Lighting System (ESAF)

| S. No. | Parameter   | Sampling approach                                     | Sample size  | Comments   |
|--------|---|---|--|--|
| 1      | Total number of lamps checked for which a valid result was obtained | Simple random sampling for proportion-based parameter | For e.g.:<br><br><b>As per sample size calculation, sample size requirement for:</b><br>KL (2015)-116<br>MP (2016)-1<br><b>Actual monitored samples for:</b><br>KL (2015)-116<br>MP (2016)-1 | As per guidance given in section 6, 37 (a), page 14 of AMS III.AR version 7.0, The sampling size is determined by minimum 90 per cent confidence interval and the 10 per cent maximum error margin; the size of the sample shall be no less than 100; For e.g. if total sample size is less than 100, then minimum 100 samples are selected. For states, the total sale is less than 100, all units are sampled. For states MP (2016), the total sale is less than 100, all units (1) are sampled. Further, for some of the states KL (2015), the sample size is more than 100 therefore the required sample size is monitored. Detailed sample size for all other states and calculation is |

|  |  |  |  |   |
|--|--|--|--|---|
|  |  |  |  | provided in Emission reduction calculation sheet. |
|--|--|--|--|---|

## 2. VPA3 GSID 11475

### Improved Cookstoves (ESAF)

| S.No | Parameter   | Sampling approach   | Sample size |     |
|------|---|---|-------------|-----|
| 1    | Usage rate in project scenario p during year y ( $U_{p,y}$ )                        | Simple random sampling for proportion-based parameter           | State       | Y-1 |
|      |   |   | Smart KL    | 175 |
| 2    | Quantity of fuel that is consumed in project scenario p during year y ( $P_{p,y}$ ) | Carry out KPTs- Simple random sampling for mean based parameter | 90          |     |

### Solar Lighting System (ESAF and Muthoot)

| S. No. | Parameter   | Sampling approach                                     | Sample size  | Comments  |
|--------|---|---|--|---|
| 1      | Total number of lamps checked for which a valid result was obtained | Simple random sampling for proportion-based parameter | For e.g.:<br><br><b>As per sample size calculation, sample size requirement for:</b><br>TN (2016)-90<br>MH (2017)-5<br><b>Actual monitored samples for:</b><br>TN (2016)-90<br>MH (2017)-5 | As per guidance given in section 6, 37 (a), page 14 of AMS III.AR version 7.0, The sampling size is determined by minimum 90 per cent confidence interval and the 10 per cent maximum error margin; the size of the sample shall be no less than 100; For e.g. if total sample size is less than 100, then minimum 100 samples are selected. For states, the total sale is less than 100, all units are sampled. For states MH (2017), the total sale is less than 100, all units (5) are sampled. Detailed sample size for all other states and calculation is provided in Emission reduction calculation sheet. |

## 3. VPA4 GSID 11476

### Improved Cookstoves (SKDRDP)



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

#### Solar Lighting System (SKDRDP)

| S. No. | Parameter   | Sampling approach                                     | Sample size  | Comments   |
|--------|---|---|--|--|
| 1      | Total number of lamps checked for which a valid result was obtained | Simple random sampling for proportion-based parameter | For e.g.:<br><br><b>As per sample size calculation, sample size requirement for:</b><br>KA (2013)-171<br><b>Actual monitored samples for:</b><br>KA (2013)-171 | As per guidance given in section 6, 37 (a), page 14 of AMS III.AR version 7.0, The sampling size is determined by minimum 90 per cent confidence interval and the 10 per cent maximum error margin; the size of the sample shall be no less than 100; For e.g. if total sample size is less than 100, then minimum 100 samples are selected. For states, the total sale is less than 100, all units are sampled. Further, for some of the states KA (2013), the sample size is more than 100 therefore the required sample size is monitored. Oversampling is done for monitoring to account for situation if the required precision does not pass/meets. Detailed sample size for all other states and calculation is provided in Emission reduction calculation sheet. |

#### 4. VPA7 GSID 11477

#### Improved Cookstoves (SKDRDP)

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

|   |   |   |    |     |  |
|---|---|---|----|-----|--|
|   |   |   | KA | 101 |  |
| 2 | Quantity of fuel that is consumed in project scenario p during year y ( $P_{p,y}$ ) | Carry out KPTs- Simple random sampling for mean based parameter | 90 |     |  |

### Improved Cookstoves (ESAF)

| S.No | Parameter   | Sampling approach   | Sample size       |         |
|------|---|---|-------------------|---------|
| 1    | Usage rate in project scenario p during year y ( $U_{p,y}$ )                        | Simple random sampling for proportion-based parameter           | State             | Samples |
|      |   |   | CG                | 118     |
|      |   |   | MP                | 100     |
|      |   |   | TN                | 121     |
| 2    | Quantity of fuel that is consumed in project scenario p during year y ( $P_{p,y}$ ) | Carry out KPTs- Simple random sampling for mean based parameter | 90 for each state |         |

### Solar Lighting System (SKDRDP and Bandhan)

| S. No. | Parameter   | Sampling approach                                     | Sample size   | Comments  |
|--------|---|---|---|---|
| 1      | Total number of lamps checked for which a valid result was obtained | Simple random sampling for proportion-based parameter | <p>For e.g.:</p> <p><b>As per sample size calculation, sample size requirement for:</b></p> <p>WB (2018) - 7<br/>AS (2018) - 111</p> <p><b>Actual monitored samples for:</b></p> <p>WB (2018) - 8<br/>AS (2018) - 111</p> | <p>As per guidance given in section 6, 37 (a), page 14 of AMS III.AR version 7.0, The sampling size is determined by minimum 90 per cent confidence interval and the 10 per cent maximum error margin; the size of the sample shall be no less than 100; For e.g. if total sample size is less than 100, then minimum 100 samples are selected. For states, the total sale is less than 100, all units are sampled. For e.g. if total sample size is less than 100, then minimum 100 samples are selected. For states like WB (2018), the total sale is less than 100, all units are sampled. Further, for some of the states AS (2018), the sample size is more than</p> |

|  |  |  |  |   |
|--|--|--|--|---|
|  |  |  |  | 100 therefore the required sample size is monitored. Oversampling is done for monitoring to account for situation if the required precision does not pass/meets. Detailed sample size for all other states and calculation is provided in Emission reduction calculation sheet. |
|--|--|--|--|---|

## 5. VPA11 GSID 11481

### Improved Cookstoves(ESAF)

| S.No | Parameter   | Sampling approach   | Sample size                         |         |  |
|------|---|---|-------------------------------------|---------|--|
| 1    | Usage rate in project scenario p during year y ( $U_{p,y}$ )                        | Simple random sampling for proportion-based parameter           | State                               | Samples |  |
|      |   |   | Jumbo KA                            | 115     |  |
|      |   |   | Jumbo KL                            | 127     |  |
|      |   |   | Smart MH                            | 130     |  |
|      |   |   | Smart KA                            | 31      |  |
|      |   |   | PowerG TN                           | 100     |  |
| 2    | Quantity of fuel that is consumed in project scenario p during year y ( $P_{p,y}$ ) | Carry out KPTs- Simple random sampling for mean based parameter | 90 for each model state combination |         |  |

### Solar Lighting System (Muthoot)

| S. No. | Parameter   | Sampling approach                                     | Sample size  | Comments  |
|--------|---|---|--|---|
| 1      | Total number of lamps checked for which a valid result was obtained | Simple random sampling for proportion-based parameter | For e.g.:<br><br><b>As per sample size calculation, sample size requirement for:</b><br><br>OD - 100<br>KA - 114 | As per guidance given in section 6, 37 (a), page 14 of AMS III.AR version 7.0, The sampling size is determined by minimum 90 per cent confidence interval and the 10 per cent maximum error margin; the size of the sample shall be no less than 100; For e.g. if total |

|  |  |  |   |  |
|--|--|--|---|--|
|  |  |  | <p><b>Actual monitored samples for:</b></p> <p>OD - 15<br/>KA - 114</p> | <p>sample size is less than 100, then minimum 100 samples are selected. For states, the total sale is less than 100, all units are sampled. Further, for some of the states e.g. KA (2017), the sample size is more than 100 therefore the required sample size is monitored. Oversampling is done for monitoring to account for situation if the required precision does not pass/meets. Detailed sample size for all other states and calculation is provided in Emission reduction calculation sheet.</p> |
|--|--|--|---|--|

#### 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 III.AR version 7.0. The confidence/precision of 90/10 is met for all the parameters for ICS as per TPDDTEC v3.1. In case, the confidence/precision is not met for any parameter for improved cookstove, the upper or lower bound is conservatively applied to arrive at final values for the parameter as per TPDDTEC v3.1. 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 CDM project activities and programme of activities version 9.0" using simple random sampling approaches.

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

## SECTION E. CALCULATION OF SDG IMPACTS

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

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#### **Calculations for Improved Cookstoves and Solar Lighting Systems** **SDG 13: Climate Action (Improved Cookstoves)**

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

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

Where:

|                      |   |
|----------------------|---|
| $BE_{b,y}$           | Emissions for baseline scenario b during the year y in tCO <sub>2</sub> e   |
| $B_{b,y}$            | Quantity of fuel consumed in baseline scenario b during year y, in tons, as per by-default factors (cases with project performance field test only)   |
| $f_{NRB,y}$          | Fraction of biomass used during year y for the considered scenario that can be established as non-renewable biomass (drop this term from the equation when using a fossil fuel baseline scenario) |
| $NCV_{b,fuel}$       | Net calorific value of the fuel that is substituted or reduced (IPCC default for wood fuel, 0.015 TJ/ton)   |
| $EF_{b,fuel,CO2}$    | CO <sub>2</sub> emission factor of the fuel that is substituted or reduced. 112 tCO <sub>2</sub> /TJ for Wood/Wood Waste, or the IPCC default value of other relevant fuel                        |
| $EF_{b,fuel,nonCO2}$ | Non-CO <sub>2</sub> emission factor of the fuel that is substituted or reduced  |

EF can include a combination of emission factors from fuel production, transport, and use. CO<sub>2</sub> and non-CO<sub>2</sub> emissions factors for charcoal may be estimated from project specific monitoring or alternatively by researching a conservative wood to charcoal production ratio (from IPCC, credible published literature, project-relevant measurement reports, or project-specific monitoring) and multiplying this value by the pertinent EF for wood.

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

Where:

$N_{p,y}$  Project technology-days in the project database for project scenario p through year y

$P_{b,y}$  Specific fuel consumption for an individual technology in baseline scenario b during year y converted to tons/day

**Baseline Estimate for improved cookstove is shown below:**

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

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

| VPA Number | States   | Total BE <sub>y</sub>                                     |
|------------|--|---|
| VPA2       | Kerala<br>Tamil Nadu   | 101,767<br>37,877   |
| VPA 3      | Kerala   | 97,371  |
| VPA4       | Karnataka  | 83,138  |
| VPA7       | Karnataka<br>Tamil Nadu<br>Chhattisgarh<br>Madhya Pradesh  | 118591<br>4557<br>11602<br>8432                           |
| VPA11      | Jumbo<br>Karnataka<br><br>PowerGram<br>Tamil Nadu<br><br>Smart<br>Karnataka<br><br>Smart<br>Maharashtra<br><br>Jumbo<br>Kerala | 2152<br><br><br>6304<br><br>125<br><br>39350<br><br>23529 |

**13: Climate Action: Solar Lighting Systems**

AMS III.AR v7.0

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

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

| Parameter    | Unit                    | Value   |
|--------------|-------------------------|---|
| $ER_y$       | tCO <sub>2</sub> e      | Emission reductions in year y   |
| $N_{i,j}$    | Number of project lamps | Number of project lamps distributed to end users of type <i>i</i> with charging method <i>j</i>   |
| $BE_{y,i}$   | tCO <sub>2</sub> e      | Baseline emissions per project lamp in year y   |
| $PE_{y,i}$   | tCO <sub>2</sub> e      | Project emissions per project lamp in year y  |
| $OF_{y,i,j}$ | %                       | Percentage of project lamps distributed to end users that are operating and in service in year y, for each lamp type <i>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 <sub>2</sub> e                  | Baseline emissions per project lamp in year y  |
| DV        | tCO <sub>2</sub> e per project lamp | Lamp Emission Factor (default is 0.092 tCO <sub>2</sub> e per project lamp)  |
| $GF_y$    | -                                   | Grid Factor in year y, <ul style="list-style-type: none"> <li>• Equal to 1.0 when charging option defined in paragraph 3(a) is used;</li> <li>• 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);</li> <li>• Otherwise it is equal to 1.0 minus (the fraction of time grid is available</li> </ul> |

|                 |   |   |
|-----------------|---|---|
|                 |   | to the target households and communities/users in the region of project activity)   |
| DB <sub>y</sub> | - | Dynamic Baseline Factor (change in baseline fuel, fuel use rate, and/or utilization during crediting period) in year y. Calculated as either: <ul style="list-style-type: none"> <li>• Option 1: default of 1.0 in the absence of relevant information;</li> <li>• 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)</li> </ul> |

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 <sub>2</sub> e per project lamp | Lamp Emission Factor (default is 0.092 tCO <sub>2</sub> e per project lamp) |
| FUR       | liters/hour                         | Fuel use rate (0.03 liters/hour)  |
| O         | hours/day                           | Utilization rate (3.5 hours/day)  |
| U         | days/year                           | Annual utilization (365 days/year)  |
| EF        | kgCO <sub>2</sub> /liter            | Fuel emissions factor (2.4 kgCO <sub>2</sub> /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)  |

The baseline estimates are as follows:

| VPA Number | Total BE <sub>i,v</sub> |
|------------|-------------------------|
|------------|-------------------------|



|       |        |
|-------|--------|
| VPA 2 | 5875   |
| VPA 3 | 25,745 |
| VPA 4 | 41,509 |
| VPA 7 | 43,664 |
| VPA11 | 12415  |

## SDG 7: Affordable and Clean Energy

ACS<sub>Baseline</sub> Access to affordable and clean energy (Number of households with operating ICS/SLS units under Baseline) = 0

## SDG 8: Decent Work and Economic Growth

QE IG<sub>Baseline</sub> Quantitative Employment and income generation (Number of person (male and female) hired under Baseline) = 0

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

>>

### SDG 13: Climate Action

For SLS:

The project estimate for SLS = 0

### For Improved Cookstoves:

Project estimate/emission calculations are conducted as follows:

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

$$B_{p,y} = N_{p,y} * ((P_{p,y} * U_{p,y}) + (P_{b,y} * (1 - U_{p,y})))$$

Where:

PE<sub>p,y</sub> Emissions for project scenario p during year y in tCO<sub>2</sub>e

B<sub>p,y</sub> Quantity of fuel consumed in project scenario p during year y, in tons, and as derived from the statistical analysis conducted on the data collected during the project performance field tests (cases when no baseline performance field test are performed, e.g. by-default baseline factors)

|                      |  |
|----------------------|--|
| $U_{p,y}$            | 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)   |
| $f_{NRB, y}$         | Fraction of biomass used during year y that can be established as non-renewable biomass (drop this term from the equation when using a fossil fuel baseline scenario)  |
| $NCV_{p,fuel}$       | Net calorific value of the project fuel (IPCC default for wood fuel, 0.015 TJ/ton). This is equal to the baseline fuel NCV in projects which use the same fuel.  |
| $EF_{p,fuel,CO2}$    | CO <sub>2</sub> emission factor of the project fuel. This is equal to the baseline fuel EF in projects which use the same fuel, 112 tCO <sub>2</sub> /TJ for Wood/Wood Waste, or the IPCC default value of other relevant fuel |
| $EF_{p,fuel,nonCO2}$ | Non-CO <sub>2</sub> emission factor of the project fuel. This is equal to the baseline fuel EF in projects which use the same fuel.  |

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

$$B_{p,y} = N_{p,y} * ((P_{p,y} * U_{p,y}) + (P_{b,y} * (1 - U_{p,y})))$$

$$= N_{p,y} * ((P_{p,y} * U_{p,y}) + (P_{b,y} * (1 - U_{p,y}))) * ((f_{NRB, y} * EF_{p,fuel, CO2}) + EF_{p,fuel, nonCO2}) * NCV_{p, fuel}$$

| VPA Number   | States         | PE <sub>y</sub> |
|--------------|----------------|-----------------|
| VPA 2        | Kerala         | 79,262          |
| VPA2         | Tamil Nadu     | 29146           |
| <b>Total</b> |                | <b>108408</b>   |
| VPA Number   | States         | PE <sub>y</sub> |
| VPA 3        | Kerala         | 71626           |
| VPA Number   | States         | PE <sub>y</sub> |
| VPA 4        | Karnataka      | 41,629          |
| VPA Number   | States         | PE <sub>y</sub> |
| VPA 7        | Karnataka      | 81,687          |
| VPA 7        | Tamil Nadu     | 3,071           |
| VPA 7        | Chhattisgarh   | 8,834           |
| VPA 7        | Madhya Pradesh | 5,925           |
| <b>Total</b> |                | <b>99,518</b>   |

| VPA Number   | States               | PE <sub>y</sub> |
|--------------|----------------------|-----------------|
| VPA11        | Jumbo Karnataka      | 1,573           |
| VPA11        | PowerGram Tamil Nadu | 4339            |
| VPA11        | Smart Karnataka      | 79              |
| VPA11        | Smart Maharashtra    | 27273           |
| VPA11        | Jumbo Kerala         | 16591           |
| <b>Total</b> |                      | <b>49,855</b>   |

## SDG 7: Affordable and Clean Energy

Fr ICS

ACS<sub>Project</sub> Access to affordable and clean energy (Number of households with operating ICS units under Project)

| VPA   | ICS    |
|-------|--------|
| VPA2  | 16,357 |
| VPA 3 | 9600   |
| VPA4  | 16821  |
| VPA 7 | 16008  |
| VPA11 | 8,474  |

For SLS

ACS<sub>Project</sub> Access to affordable and clean energy (Number of households with operating SLS units under Project)

| VPA   | SLS    |
|-------|--------|
| VPA2  | 94273  |
| VPA 3 | 63562  |
| VPA4  | 8376   |
| VPA 7 | 35061  |
| VPA11 | 179952 |

## SDG 8: Decent Work and Economic Growth

QE IG<sub>Project</sub> Quantitative Employment and income generation (Number of person (male and female) hired under Project) =

| VPA   | Female | Male | QE IG <sub>Project</sub> |
|-------|--------|------|--------------------------|
| VPA 2 | 3      | 20   | 23                       |
| VPA 3 | 3      | 40   | 43                       |

|       |   |    |    |
|-------|---|----|----|
| VPA 4 | 1 | 29 | 30 |
| VPA 7 | 6 | 54 | 60 |
| VPA11 | 3 | 45 | 48 |

### 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

| SDG | SDG Impact                        | Baseline estimate | Project estimate | Net benefit   |           |        |
|-----|-----------------------------------|-------------------|------------------|---------------|-----------|--------|
| 13  | Climate Action (ICS)              | VPA 2- 139644     | VPA 2-108408     | VPA 2-31236   |           |        |
|     |                                   | VPA 3- 97371      | VPA 3-71626      | VPA 3-25745   |           |        |
|     |                                   | VPA 4- 83138      | VPA 4-41629      | VPA 4-41509   |           |        |
|     |                                   | VPA 7-143182      | VPA 7- 99518     | VPA 7-43,664  |           |        |
|     |                                   | VPA 11-71460      | VPA11-49,855     | VPA11-21,605  |           |        |
| 13  | Climate Action (SLS)              | VPA2- 5875        | VPA 2-0          | VPA 2- 5875   |           |        |
|     |                                   | VPA 3-6278        | VPA 3-0          | VPA 3-6278    |           |        |
|     |                                   | VPA 4-1587        | VPA 4-0          | VPA 4-1587    |           |        |
|     |                                   | VPA 7-8534        | VPA 7-0          | VPA 7-8534    |           |        |
|     |                                   | VPA 11-12415      | VPA 11-0         | VPA 11 -12415 |           |        |
| 7   | Affordable and Clean Energy (ICS) | 0                 | VPA 2            | 16357         | VPA 2     | 16357  |
|     |                                   |                   | VPA 3            | 9600          | VPA 3     | 9600   |
|     |                                   |                   | VPA 4            | 16821         | VPA 4     | 16821  |
|     |                                   |                   | VPA 7            | 16008         | VPA 7     | 16008  |
|     |                                   |                   | VPA11            | 8,474         | VPA11     | 8,474  |
| 7   | Affordable and Clean Energy (SLS) | 0                 | VPA 2            | 94273         | VPA 2     | 94273  |
|     |                                   |                   | VPA 3            | 63562         | VPA 3     | 63562  |
|     |                                   |                   | VPA 4            | 8376          | VPA 4     | 8376   |
|     |                                   |                   | VPA 7            | 35061         | VPA 7     | 35061  |
|     |                                   |                   | VPA11            | 1799520       | VPA11     | 179952 |
| 8   | Decent Work and Economic Growth   | 0                 | VPA 2-23         |               | VPA 2-23  |        |
|     |                                   |                   | VPA 3-43         |               | VPA 3-43  |        |
|     |                                   |                   | VPA 4-30         |               | VPA 4-30  |        |
|     |                                   |                   | VPA 7-60         |               | VPA 7-60  |        |
|     |                                   |                   | VPA 11-48        |               | VPA 11-48 |        |

# 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 <sup>6</sup> achieved during this monitoring period |        |
|--------|--|---------|---|--------|
| 13 ICS | VPA 2  | 96,840  | VPA 2   | 31,236 |
|        | VPA 3  | 42,625  | VPA 3   | 25745  |
|        | VPA 4  | 54,210  | VPA 4   | 41,509 |
|        | VPA 7  | 82,791  | VPA 7   | 43,664 |
|        | VPA 11   | 45,940  | VPA 11  | 21,605 |
| 13 SLS | VPA 2  | 13,376  | VPA 2   | 5,875  |
|        | VPA 3  | 7,948   | VPA 3   | 6278   |
|        | VPA 4  | 5,183   | VPA 4   | 1,587  |
|        | VPA 7  | 11,677  | VPA 7   | 8,534  |
|        | VPA 11   | 22,318  | VPA 11  | 12415  |
| 7 ICS  | VPA 2  | 29,678  | VPA 2   | 16,357 |
|        | VPA 3  | 16,048  | VPA 3   | 9600   |
|        | VPA 4  | 26,943  | VPA 4   | 16,821 |
|        | VPA 7  | 25,646  | VPA 7   | 16008  |
|        | VPA 11   | 12,798  | VPA 11  | 8,474  |
| 7 SLS  | VPA 2  | 121,676 | VPA 2   | 94273  |
|        | VPA 3  | 79,849  | VPA 3   | 63562  |
|        | VPA 4  | 19,794  | VPA 4   | 8376   |
|        | VPA 7  | 46,822  | VPA 7   | 35061  |
|        | VPA 11   | 242,588 | VPA 11  | 179952 |
| 8      | VPA 2–20   |         | VPA 2–23  |        |
|        | VPA 3–20   |         | VPA 3–43  |        |

<sup>6</sup> 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 4–20

VPA 4–30

VPA 7–20

VPA 7–60

VPA 11–20

VPA 11–48

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

>>

"Amount estimated ex ante for this monitoring period in the VPA-DD (tCO<sub>2</sub>e)" is calculated from the Total emission reduction estimated for year of operation of the VPA and number of crediting days in the current monitoring period.

To achieve a comparable value of estimates for this monitoring period for VPA2, 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 (27/02/2021 to 26/02/2022) and Year-3(27/02/2022 to 26/03/2023) of CP-2 of operation of the VPAs from start date of crediting period is considered.Current monitoring period (01/01/2022 to 31/12/2022) falls between Year-2 and Year-3 of the crediting period-2.
- 
- The estimation of ex ante value is made for 57 days (Year 2-CP2 I.e 01/01/2022 to 26/02/2022) and 308 days (Year 3-CP2 I.e 26/02/2022 to 31/12/2022) totaling to 365 days (which is crediting days for this monitoring period<sup>7</sup>.

To achieve a comparable value of estimates for this monitoring period for VPA3, 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( 20/03/2021 to 19/03/2022) and Year-3(20/03/2022 to 19/03/2023) of CP-2 of operation of the VPAs from start date of crediting period is considered. Current monitoring period (01/01/2022 to 31/12/2022) falls between Year-2 and Year-3 of the crediting period-2.

<sup>7</sup> For detailed calculation of "Amount estimated ex ante for this monitoring period in the VPA-DD (t CO<sub>2</sub>e)" of this VPA, please refer to the emission reduction calculation sheet.

The estimation of ex ante value is made for 78 days (Year 2-CP2 I.e 01/01/2022 to 19/03/2022) and 287 days (Year 3-CP2 I.e 20/03/2022 to 31/12/2022) totaling to 365 days (which is crediting days for this monitoring period<sup>8</sup>).

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-2( 20/03/2021 to 19/03/2022) and Year-3(20/03/2022 to 19/03/2023) of CP-2 of operation of the VPAs from start date of crediting period is considered. Current monitoring period (01/01/2022 to 31/12/2022) falls between Year-2 and Year-3 of the crediting period-2.
- The estimation of ex ante value is made for 78 days (Year 2 I.e 01/01/2022 to 19/03/2022) and 287 days (Year 3 I.e 20/03/2022 to 31/12/2022) totaling to 365 days (which is crediting days for this monitoring period<sup>9</sup>).

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-2(01/05/2021 to 30/04/2022) and Year-3(01/05/2022 to 30/04/2023) of CP-2 of operation of the VPAs from start date of crediting period is considered. Current monitoring period (01/01/2022 to 31/12/2022) falls between Year-2 and Year-3 of the crediting period-2.
- The estimation of ex ante value is made for 120 days (Year 2) I.e 01/01/2022 to 30/04/2022 and 245 days (Year 3) I.e 01/05/2022 to 31/12/2022 totaling to 365 days (which is crediting days for this monitoring period<sup>10</sup>).

To achieve a comparable value of estimates for this monitoring period for VPA11, these are the factors/values considered:

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<sup>8</sup> For detailed calculation of "Amount estimated ex ante for this monitoring period in the VPA-DD (t CO<sub>2</sub>e)" of this VPA, please refer to the emission reduction calculation sheet.

<sup>9</sup> For detailed calculation of "Amount estimated ex ante for this monitoring period in the VPA-DD (t CO<sub>2</sub>e)" of this VPA, please refer to the emission reduction calculation sheet.

<sup>10</sup> For detailed calculation of "Amount estimated ex ante for this monitoring period in the VPA-DD (t CO<sub>2</sub>e)" of this VPA, please refer to the emission reduction calculation sheet.

- 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 (07/12/2021 to 06/12/2022) and Year-3(07/12/2022 to 06/12/2023) 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 340 days (Year 2 i.e 01/01/2022 to 06/12/2022) and 25 days (Year 3 I.e 07/12/2022 to 31/12/2022) totaling to 365 days (which is crediting days for this monitoring period 11).

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

>>

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

## SECTION F. SAFEGUARDS REPORTING

>>

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

<sup>11</sup> For detailed calculation of "Amount estimated ex ante for this monitoring period in the VPA-DD (t CO<sub>2</sub>e)" of this VPA, please refer to the emission reduction calculation sheet.



|                                    |  |
|------------------------------------|--|
| Measurement methods and procedures | The employment contract is checked to ensure compliance with Principle 6.1 |
| Monitoring frequency               | Annual   |
| QA/QC procedures                   | -  |
| Purpose of data                    | For Safeguarding Principle 6.1   |
| Additional comment                 | -  |

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

## SECTION G. STAKEHOLDER INPUTS AND LEGAL DISPUTES

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

>>

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

|               |  |
|---------------|--|
| <b>Method</b> | <b>Include all details of Chosen Method (s) so that they may be understood and, where relevant, used by readers.</b> |
|---------------|--|

|  |   |
|--|---|
| Continuous Input / Grievance Expression Process Book (mandatory) | Continuous input / Grievance Expression process book is available at the office at local partner offices.<br><br>By maintaining feedback book at the local office, it is ensured that stakeholders that don't have access to electronic media for expressing concerns / grievances are also able to share their concerns / feedback. Additionally, the end users always have an option to contact the partner organization (representative of MFI/ manufacturers etc.) in case of any feedback / complaints with the product post distribution. |
| GS Contact (mandatory)   | <a href="mailto:help@goldstandard.org">help@goldstandard.org</a>  |
| Other  | Email: <a href="mailto:skdrdp@skdrdpindia.org">skdrdp@skdrdpindia.org</a> ; <a href="mailto:care@sunking.com">care@sunking.com</a>  |

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

>>

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

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

>>

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

## Revision History

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