Gold Standard
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TEMPLATE

MONITORING REPORT

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VERSION **v. 1.1**

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

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KEY PROJECT INFORMATION

Programme of Activity Information

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

Key Project Information

GS ID (s) of Project (s)	**GS11504**
Title of the project (s) covered by monitoring report	GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - CPA 05– GS11504
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	5
Version number of the monitoring report	2
Completion date of the monitoring report	21/09/2023
Date of project design certification	01/02/2023
Date of Last Annual Report	NA
Monitoring period number	1st Monitoring Period
Duration of this monitoring period	27/06/2020 to 31/12/2022 (inclusive of both days) Monitoring period falls under crediting period CP 2: 20/04/2020 to 19/04/2025
Project Representative	Micro Energy Credits Corporation Private Limited
Host Country	India
Activity Requirements applied	☒ Community Services Activities ☐ Renewable Energy Activities ☐ Land Use and Forestry Activities/Risks & Capacities ☐ N/A

Methodology (ies) applied and version number	AMS III A.R v 7.0 Emission Reductions from Safe Drinking Water Supply v1.0
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A

Table 1 - Sustainable Development Contributions Achieved

Year 1: 2020

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
13 Climate Action (mandatory)	Number of VERs (SLS)	VPA 5 –4694	tCO_2e VERs
13 Climate Action (mandatory)	Number of VERs (WPS)	VPA 5 – 12,300	tCO_2e VERs
1 End poverty in all its forms everywhere	Proportion of population living in households with access to basic services (only for water)	VPA 5 –53.61%%	Percentage
6 Clean Water and Sanitation	Number of households served with safely managed water services	VPA 5 – 13,068	Number
7 Affordable and Clean Energy	Number of households having operational WPS	VPA 5 – 13,800	Number
7 Affordable and Clean Energy	Number of households having operational SLS	VPA 5 – 75,505	Number
8 Decent Work and Economic Growth	Quantitative Employment and income generation	VPA 5 – 50	Number

Year 2: 2021

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products

13 Climate Action (mandatory)	Number of VERs (SLS)	VPA 5 – 8,188	tCO_2e VERs
13 Climate Action (mandatory)	Number of VERs (WPS)	VPA 5 – 23,240	tCO_2e VERs
1 End poverty in all its forms everywhere	Proportion of population living in households with access to basic services (only for water)	VPA 5 –51.98%	Percentage
6 Clean Water and Sanitation	Number of households served with safely managed water services	VPA 5 – 12,707	Number
7 Affordable and Clean Energy	Number of households having operational WPS	VPA 5 – 13,418	Number
7 Affordable and Clean Energy	Number of households having operational SLS	VPA 5 – 73,575	Number
8 Decent Work and Economic Growth	Quantitative Employment and income generation	VPA 5 – 50	Number

Year 3: 2022

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
13 Climate Action (mandatory)	Number of VERs (SLS)	VPA 5 – 6,792	tCO_2e VERs
13 Climate Action (mandatory)	Number of VERs (WPS)	VPA 5 – 21,176	tCO_2e VERs
1 End poverty in all its forms everywhere	Proportion of population living in households with access to basic services (only for water)	VPA 5 –48.56%	Percentage
6 Clean Water and Sanitation	Number of households served with safely managed water services	VPA 5 – 11,949	Number

7 Affordable and Clean Energy	Number of households having operational WPS	VPA 5 – 12,618	Number
7 Affordable and Clean Energy	Number of households having operational SLS	VPA 5 – 71,298	Number
8 Decent Work and Economic Growth	Quantitative Employment and income generation	VPA 5 – 50	Number

Table 2 – Product Vintages

		Amount Achieved
Start Dates	**End Dates**	**VERs**
27/06/2020	31/12/2020	WPS – 12,300 SLS –4,694 Total –16,994
01/01/2021	31/12/2021	WPS – 23,240 SLS – 8,188 Total – 31,428
01/01/2022	31/12/2022	WPS – 21,176 SLS – 6,792 Total – 27,969

SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

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In the rural areas of India, the predominant means of drinking water is by boiling using traditional cook stoves that use woody biomass as fuel. The smoke and fumes from these stoves contribute heavily to indoor air pollution. In rural areas of India, households are either not connected to the grid or in households even with grid connectivity, there are frequent power outages and low voltage so rural households must use kerosene for indoor lighting, which also contributes to indoor air pollution and GHG emissions.

The VPA involves marketing, education, distributing, and financing solar lighting systems, and water purification devices for low-income households and microentrepreneurs in India. Micro Energy Credits Corporation Private Limited is the Coordinating and Managing Entity of this PoA and coordinates efforts of VPA implementers to distribute Clean Energy Products in India.

These products provide clean drinking water and renewable energy for lighting. The water purification devices distributed under the proposed VPA replace traditional cookstoves thereby eliminating the use of fuelwood for boiling raw water in the baseline by households and thus reducing GHG emissions corresponding to the fuelwood saving by the project activity.

The program is a voluntary initiative coordinated by Micro Energy Credits Corporation Private Limited (MEC), the CME of the PoA, and implemented by MEC's Partner Organizations (PO). The water purification system is implemented by Evangelical Social Action Forum (ESAF). Solar lighting systems are implemented by Shri Kshetra Dharamsthala Rural Development Project (SKDRDP), Bandhan Microfinance, and Muthoot Microfin Ltd.

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

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

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

A.2. Location of project

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VPA 5 – GS 11504

a. Host Party (ies) - India

b. Region/State/Province – The state of Kerala is for Water purifiers and several regions within this state. For solar lighting systems, the states such as Assam (AS), Bihar (BH), Jharkhand (JK), Uttar Pradesh (UP), Gujarat (GJ), Madhya Pradesh (MP), Maharashtra

(MH), Kerala (KL), Karnataka (KA), Odisha (OD), Tamil Nadu (TN), 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.

The location of each clean energy installation as per a GPS location or verified address will be recorded in Micro Energy Credit's Credit Tracker Platform, which has been designed specifically for accelerating microfinance access to clean and efficient energy. These locations will define the more precise boundary of the project activities.

The Credit Tracker Platform is used to collect and store the information related to the unique identification number, location, installation date, and usage status of each clean energy product in the VPAs, making it easy to identify, locate and verify any or all the installations that pertain to the VPAs. The MEC Credit Tracker Platform is a hosted internet service, limiting the risk of loss of data.

Figure 1: Map of India

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[1]"

Water Purification System: Methodology for Emission Reductions from Safe Drinking Water Supply (Version 1.0)[2]

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

A.4. Crediting period of project

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VPA Reference Number	Crediting Start Date	Crediting End Date (CP-1)	Crediting Start Date (CP-2)	GS4GG Crediting End Date	GS4GG Eligible Crediting End Date[3]
GS11504	20/04/2015	19/04/2020	20/04/2020	19/04/2025	19/04/2030

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

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There is one VPA part of this batch.

VPA GS ID	VPA Title
GS11504	GS11450- MicroEnergy Credits -Microfinance for Clean Energy Product Lines – India – MicroEnergy Credits PoA – CPA 05 – GS11504

VPA5 - GS ID: GS11504

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 –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.

[1] AMS III.AR version 7.0
[2] Safe Water Meth v1.0
[3] As these are CDM Transitioned projects, GS4GG allows a total crediting period of 15-years from the CDM crediting start date.

Measures taken: The VPA involves marketing, distributing, financing solar lighting systems and water purification systems for low-income households and micro entrepreneurs in different states of India. These products provide renewable energy for lighting and safe drinking water. The total number of units implemented under this VPA till date is:

Solar Lighting systems – 91,245

Water purification systems – 23,425

Year	Water Purifiers	Solar Lamps
2013	38	1,570
2014	14863	3,704
2015	2548	2,693
2016	5976	32,019
2017	-	37,230
2018	-	718
2019	-	13,311
Total	**23,425**	**91,245**

No further sales have been added in the current monitoring period (27/06/2020 to 31/12/2022).

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

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

- HUL Pureit classic

This is a large size purifier with a 23-litre capacity. It includes an activated carbon trap that removes harmful pesticides and undesirable odor. It also has an auto shut-off feature that ensures water purity. In the absence of the project activity, the households would have continued to boil water for drinking purposes. The technical specifications[4] of the water purifier are as follows –

Size – 61 cm X 29 cm X 21 cm
Net weight: 4.1 kg
Warranty Period- 2 years
US EPA and National Standard Approved

[4] Manufacturer's certificate on specifications

Average life span under standard use conditions: The life span of the germ kill kit used by the purifier has a capacity of 1500 l after which it must be replaced. The life of the kit therefore depends on how much water is purified by the user every day.

Solar Lighting System

The solar lighting system models implemented under this VPA are

1. 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

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

3. Sunking HLS120

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. Sunking Pro400

The technical specifications of this product are –
Type and Solar Panel Wattage: Polycrystalline/5.2W
Lighting Wattage – 5.5
Luminous flux output (Lumens): 400
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/5Ah,3.7 V
Type of charge controller -Active
Solar Run time(SRT): 5-6hours
Warranty – 1 year

5. Selco Super Bright HLS (Model Number – SB4HLS):

The technical specifications of this product are –

Total Light system wattage: 30W

Luminous intensity (Lumens): 2350

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

6. Selco Shankara 3 Light (Model Number – SKD3L):

The technical specifications of this product are –

Total Light system wattage: 12W

Luminous intensity (Lumens): 680

Average Lifetime of product (in years) –

Module – 15 years

Battery – 8 years

Electronics – 5 years

c. Relevant dates for the VPA –

1. Construction/Implementation date – The water purifiers under this VPA are implemented from 13/08/2013 to 31/10/2016. The solar lighting systems are implemented from 03/01/2013 to 31/05/2019.
2. Commissioning –91,245 Solar Lighting Systems (i.e. 1,35,249 solar lamps) and 23,425 Water purification systems are distributed until the end of monitoring

period under this VPA. The exact commissioning/installation dates for all the CEPs are mentioned in the Emission Reduction Calculation sheet for this VPA.

3. Continued operation periods – All of the functional products were continuously operational during the course of this monitoring period. Non-functional products are discounted in emission reduction calculation. Details of the Usage rates are mentioned in the Section D.2

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

The total GHG emission reductions achieved in this monitoring period for the VPA is 76,390 tCO_2e.

e. Avoiding double counting –

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

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

Partner	**Unique Identification number for the households**	**Unique identification number for the CEP**
ESAF	Customer identification number	Loan Proposal Identification Number
SKDRDP	Group Identification number-Member ID	Branch ID-Loan account number
Muthoot	Customer identification number	Transaction identification number
Bandhan	Customer identification number	Transaction identification number

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

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

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

- MEC signs contracts with each microfinance institution documenting that the emissions reductions in a specific project activity are included in that project and that project alone

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

The MEC Credit Tracker Platform maintains data on all installations, including each CEP unique identifier number, the date of installation and the VPA/PoA with which they are associated. The platform's use of locations for each installation will ensure that each clean energy product is only included in a single VPA under a single PoA. The credit tracker platform also allocates a system generated number call "sysnum" to each installation under the PoA. No two CEP installations can have the same "sysnum".

B.1.1 Forward Action Requests

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NA

B.2. Post-Design Certification changes

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

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NA

B.2.2. Corrections

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NA

B.2.3. Changes to start date of crediting period

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NA

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

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NA

B.2.5. Changes to project design of approved project

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NA

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

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

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

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

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

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

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

- Unique identifier number for CEP

- Date of monitoring
- Usage status at time of monitoring

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

Summary:

1. Each PO keeps a record of all the CEPs it installs in the MEC Credit Tracker Platform. The record includes the name, date of installation, model of CEP and location of the product. All records are screened by the CME and cross-checked with the PO records to confirm the installation record is authentic and no double counting occurs.

2. The values of the emission reduction parameters required for ex-post ER calculation - usage rate of the water purifiers ($U_{p,y}$), usage time ($t_{p,y}$), household size ($HN_{p,y}$), volume of water consumed (QPW_p), number of devices in the premises ($DN_{p,y}$), proportion of end users that boil safe water in the project year ($X_{cleanboil,y}$), water quality (M_q), number of lamps distributed to end user ($N_{i,j}$), percentage of project lamp operational ($OF_{y,i,j}$), baseline lamp being replaced ($Lamp_{baseline}$) are found from sampling of CEP installations.

3. The records kept in the MEC Credit Tracker Platform relate to paper copies of title transfer agreements received from individual households.

Quality assurance

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

Generalities

The CME along with the PO coordinated all ex-post monitoring activities. The CME is ultimately responsible for implementing the monitoring plan, ensuring the quality of data obtained and the use of this data for emissions reduction calculations. However, the actual field measurements to be conducted during monitoring (e.g. water consumption test or water quality test) has been performed by enumerators trained by CME and PO field staff. Sampled households were visited for 4 days to collect the data on the quantity of water consumed per day by households. The water purification system was filled at the same time each day up to capacity. To get the household stock of water consumption responses were recorded to capture refilling of the water purifier done in the previous day. The enumerators measured the remaining capacity of the water using a volumetric jar. The data was collected directly in the Microsoft excel.

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

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

Usage survey shall be designed in line with the requirement of Usage Survey Guidelines outlined in Annex-1 of the applied methodology.

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

Technical Failure and Maintenance Protocol

POs have a robust aftersales mechanism in place which ensures customer complaints are registered and resolved in a timely manner. The mechanism involves various steps:

Step 1: Complain Registration

Step 2: Logging complaint

Step 3: Collection of products for repair

Step 4: Resolution of the complaint

Step 5: Feedback (optional)

Customers register complaints 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 the 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.

The 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.

For WPS, total repairs done were 1,221 for VPA 5. For SLS, 1,566 repairs were done for VPA 5. It can be confirmed through credit tracker output file where the data from the partner is stored. Sample tracker screenshots and sample service request forms have been submitted.

CME has put in place a system for annual and quarterly monitoring for water purifier and solar lighting systems respectively.

- Solar Lighting Systems

CME/PO have tracked the usage status of all solar lighting systems from each quarter of the year with results recorded in Credit Tracker.

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

POs conduct quarterly monitoring during the course of their regular interactions with Self-Help Groups (SHGs), which hold weekly meetings with MFI Field Officers. At the end of each quarterly monitoring period, MFI Field Officers survey clients as to the product usage status and information on presence of any other solar product.

This data is reported to MEC through and recorded in the Credit Tracker platform. Any solar lighting systems that are non-operational (due to failure or disuse by owner) are recorded as "failed" or "installed_damaged" lamps. For such solar lighting systems emission reduction are not claimed. CME doesn't remove the damaged products from the database due to two reasons:

1. Products which are damaged in one quarter or one monitoring period might get repaired or replaced, which means there is chance those might be working during subsequent monitoring.
2. Removing products from database especially where no new sales are getting added means change in the design of the programme. Therefore, CME retains the product in the database but do not claim credits for the same.

- Water Purification System

In addition to methodological requirement to calculate Usage Rate (which is used to discount the ERs), as part of QA/QC defined in the PoA-DD and VPA-DD, Annual monitoring is carried out to determine the servicing requirement of all the WPS in the PoA. Based on the results of this annual monitoring survey, individual WPS status is marked as installed_active and installed_damaged. The status ïnstalled_damaged" could reflect minor damage which does not affect the operational capability of the WPS, but to be conservative the VPA does not claim emission reductions for WPS marked "installed_damaged". The ERs are adjusted accordingly (by accounting ERs only for WPS that are "installed_active"). CME doesn't remove the damaged products from the database due to two reasons:

1. Products which are damaged in one monitoring period might get repaired or replaced which means there is chance those might be working during subsequent monitoring.
2. Removing products from database especially where no new sales are getting added means change in the design of the programme. Therefore, CME retains the product in the database but do not claim credits for the same.

SECTION D. DATA AND PARAMETERS

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

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SDG 13

Water Purification System

Parameter ID	**SDWS 2**
Data/parameter	Project Technology Description
Unit	N/A
Description	The following is the detailed description of the planned project technology: HWT and IWT: Manufacturer- Hindustan Unilever Limited (HUL) Technology type- gravity based purifier Product name- HUL Pureit Classic
Source of data	Manufacturer's specifications
Value(s) applied	Please refer to Section B.1
Choice of data or Measurement methods and procedures	-
Purpose of data	-
Additional comment	This parameter is fixed ex-ante & shall be updated at CP renewal

Parameter ID	**SDWS 4**
Data/parameter	Regulatory Framework for safe water supply
Unit	N/A
Description	Regulatory Framework for safe water supply
Source of data	BIS Standards for Drinking Water
Value(s) applied	The VPA contributes to: National Water Policy (2012) The policy states in paragraph 1.2 (v) that access to safe water for drinking still continues to be a problem and 1.3 (vi) that safe water for drinking and sanitation should be

	considered as pre-emptive needs followed by other needs. In addition, the importance of community sensitization and utilization of water as per local availability of waters before providing water through long distance transfer is highlighted (paragraph 3.6.). Jal Jeevan Mission JJM (2019-2024) The vision of the JJM is that every household has drinking water supply in adequate quantity of prescribed quality on regular and long-term basis at affordable service delivery charges leading to improvement in living standards of rural communities. JJM further stresses the importance of awareness raising and involvement of stakeholders (paragraph 3.3 viii.) and highlight the contribution of technological interventions for removal of contaminants where water quality is an issue (paragraph 3.4 ii.). The VPA contributes to three core aspects mentioned in the National Water Policy (2012) and the Jal Jeevan Mission (2019-2024): 1. Supply of rural communities with safe drinking water (point-of-use treatment) 2. Awareness raising on WASH aspects 3. Stakeholder participation in project activities. The water quality of the treated water is in line with the national drinking water standard of India: 0 CFU E.Coli/100ml (IS 10500 : 2012)
Choice of data or Measurement methods and procedures	The test reports from national accredited labs confirms that the filtered water from the purifier is in compliance with the above values.
Purpose of data	-
Additional comment	This parameter is fixed Ex-ante & shall be updated at CP renewal.

Parameter ID	**SDWS 5**
Data/parameter	Water sources in the project boundary
Unit	N/A
Description	The water sources in the project boundary are identified and if classified to be used for drinking water, then further classified as improved and unimproved water source.

Source of data	Baseline study /Credible published literature for project region/ Studies by academia, NGOs or multilateral institutions/ or Official government publications or statistics
Value(s) applied	Refer to Section B.4 of the VPA-DD
Choice of data or Measurement methods and procedures	Baseline Study
Purpose of data	-
Additional comment	This parameter is fixed Ex-ante & shall be updated at CP renewal.

Parameter ID	**SDWS 6**
Data/parameter	Stove technologies used in the project boundary
Unit	N/A
Description	The stove type/technology used in premises in the geographical area of the project is mainly traditional three stone fired cookstoves having an efficiency of 10%.
Source of data	Baseline survey and studies by academia, NGOs or multilateral institutions
Value(s) applied	**VPA** / **State** / **Three-stone fired** / **Gas Stove** VPA 5 / Kerala / 10% / 57%
Choice of data or Measurement methods and procedures	Baseline survey and studies by academia, NGOs or multilateral institutions.
Purpose of data	Calculation of baseline emissions
Additional comment	This parameter is fixed Ex-ante & shall be updated at CP renewal.

Parameter ID	**SDWS 7**
Data/parameter	Expected technical life of project technology
Unit	Volume or Years
Description	The expected technical life of an individual project technology is defined in section A.3 of the VPA-DD. The details include the life of different product types used.
Source of data	Manufacturer specifications
Value(s) applied	1500 litre (HUL Pureit)

Choice of data or Measurement methods and procedures	Manufacture specification
Purpose of data	Calculation of baseline emissions
Additional comment	The technical specification of the water purification systems, provided by the manufacturer, does not specify the life span of the water purification system unit/console rather it mentions only the life span (in terms of litres of purified water) of the Germ Kill Kit (GKK) and cartridges which is clearly specified in the VPA-DD. In cases where the life span of the water purifier technologies is shorter than the crediting period of the PoA, the project proponent shall ensure that the units are replaced in order to continue claiming emission reductions. There shall be measures in place to ensure that end users have access to replacement purification systems of comparable quality. The technology/equipment will be replaced prior to the life span so that end users can access the same level of water purification. If no replacement or retrofitting is provided, emission reduction claims are limited to the expected technical life.

Parameter ID	**SDWS 8**
Data/parameter	x_f
Unit	Percentage of fuel f use in target population
Description	The proportion of each different cooking fuel f used in the project boundary by end-users: - % among the target population if single fuel is used for water boiling. If the project covers different types of end-user premises (e.g. households, schools), then the fuels used in the geographical area of the project by the same types of end-users are to be determined for each end-user premises type.
Source of data	Baseline survey cross checked with credible published literature for project region/studies by academia/NGOs or multilateral institutions, or Official government publications or statistics
Value(s) applied	

VPA	State	Fuelwood	LPG
VPA 5	Kerala	92%	8%

Choice of data or Measurement methods and procedures	Baseline survey and studies by academia, NGOs or multilateral institutions.
Purpose of data	Calculation of baseline emissions
Additional comment	This parameter is fixed Ex-ante & shall be updated at CP renewal.

Parameter ID	**SDWS 9**
Data/parameter	$EF_{b,f,CO2}$
Unit	tCO_2/TJ
Description	CO_2 emission factor arising from use of fuels in baseline Scenario
Source of data	IPCC default CO_2 emission factor for wood and LPG
Value(s) applied	Firewood – 112 LPG – 63.1
Choice of data or Measurement methods and procedures	Default IPCC value for fuelwood/LPG is applied
Purpose of data	Calculation of baseline emissions
Additional comment	-

Parameter ID	**SDWS 10**
Data/parameter	$EF_{b,f,non\text{-}CO2}$
Unit	tCO_{2e}/TJ
Description	Non-CO_2 emission factor from use of fuels, in case the baseline fuel is biomass or charcoal
Source of data	IPCC defaults for wood
Value(s) applied	Wood: 9.46
Choice of data or Measurement methods and procedures	Default IPCC value for fuelwood and charcoal is applied
Purpose of data	Calculation of baseline emissions
Additional comment	-

Parameter ID	**SDWS 11**
Data/parameter	ηwb

Unit	%
Description	Weighted average efficiency of the baseline water boiling devices. Calculate the weighted average of the water boiling efficiency in the project boundary using the proportion of different stove types used and the stove efficiencies.
Source of data	As per methodology Emission Reductions from Safe drinking water supply version 1.0, the following default values may be applied to calculate the weighted average of the water boiling efficiency in the project boundary: - Three-stone fire or a conventional system for woody biomass lacking improved combustion air supply mechanism and flue gas ventilation system, that is without either a grate or a chimney: default efficiency 10%. – Other conventional systems using woody biomass: default efficiency 20%. - Improved cookstoves: manufacturer specification, or if not available, default efficiency 30%. For Gas Stove (LPG based) – Literature review
Value(s) applied	Three-stone fired - 10% Gas Stove –57%
Choice of data or Measurement methods and procedures	Default defined in "Methodology for Emission Reductions from Safe Drinking Water Supply" v1.0 for traditional stove. Literature review for gas stove efficiency.
Purpose of data	Calculation of Baseline emissions
Additional comment	-

Parameter ID	**SDWS 12**
Data/parameter	C_b
Unit	Percentage
Description	Proportion of project end-users who in the baseline were already using safe water, either from an improved water source, or from a water treatment method other than boiling.
Source of data	Baseline survey/Published literature for project region
Value(s) applied	**VPA** | **State** | **C_b** VPA 5 | Kerala | 5.30%

Choice of data or Measurement methods and procedures	Baseline Study and Official government publications or statistics.
Purpose of data	Calculation of baseline emissions
Additional comment	The safe water sources and percentages shall be consistent with the information reported for parameter Water sources in the project boundary (SWDS 5). Users who have access to a source of safe water in the baseline (either from an improved water source, or from a water treatment method other than boiling) may not be credited under the project, unless project demonstrates that the baseline source of water does not meet safe water quality criteria, by conducting water quality tests over a representative period of time of 6 months or by referring to credible published literature or other sources. This parameter is fixed Ex-ante & shall be updated at CP renewal.

Parameter ID	**SDWS 13**
Data/parameter	q_i
Unit	Litres per hour
Description	Capacity of the household or institutional water treatment technology
Source of data	Manufacturer specifications/ Design specifications
Value(s) applied	HUL Pureit – 9 L/h
Choice of data or Measurement methods and procedures	Manufacture specification
Purpose of data	Calculation of baseline emissions
Additional comment	This depends on water filtration device model and fixed for each model introduced. The capacity of the water treatment technology will help in calculating the amount of water treated. This parameter is fixed Ex-ante & shall be updated at CP renewal.

Parameter ID	**SDWS 21**
Data/parameter	$f_{NRB,b,i,y}$
Unit	Fractional non-renewability
Description	Fractional non-renewability status of woody biomass fuel during year y, in case the baseline fuel is biomass
Source of data	Assessment based on CDM Methodological tool 30: Calculation of the fraction of non-renewable biomass, Version 03.0
Value(s) applied	Kerala – 0.765
Choice of data or Measurement methods and procedures	A preliminary study has been conducted in accordance with the CDM Methodological tool 30: Calculation of the fraction of non-renewable biomass, Version 03.0
Purpose of data	For emission reduction calculations
Additional comment	-

For Solar Lighting Systems

Data/parameter	**DV**
Unit	tCO_2e 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_2e 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

>>

Water Purification System

SDG 13

VPA 5 GS11504

<table>
<tr><td>Parameter ID</td><td>SDWS 18</td></tr>
<tr><td>Data/parameter</td><td>$M_{q,y}$</td></tr>
<tr><td>Unit</td><td>Fraction</td></tr>
<tr><td>Description</td><td>Ongoing water quality indicated as the fraction of the samples that pass microbial quality standard requirements specified in relevant microbial quality standard for drinking water of the host country. In case a national standard is not available, the water quality shall comply with WHO Guideline values for verification of microbial quality i.e., all water directly intended for drinking must not have detectable E.Coli in any 100 ml sample i.e., less than 1 Colony Forming Unit (CFU) of E.Coli /100 ml</td></tr>
<tr><td>Source of data</td><td>Testing of water at the exits of the treatment technology for a representative sample of end-users</td></tr>
<tr><td>Value(s) applied</td><td>
<table>
<tr><th>VPA</th><th>Partner</th><th>State</th><th>Model</th><th>M_q</th></tr>
<tr><td rowspan="3">VPA 5</td><td rowspan="3">ESAF</td><td rowspan="3">Kerala</td><td rowspan="3">HUL Pureit</td><td>1 (Year-1)</td></tr>
<tr><td>1 (Year-2)</td></tr>
<tr><td>1 (Year-3)</td></tr>
</table>
</td></tr>
<tr><td>Measurement methods and procedures</td><td>Water samples are collected from selected sample households and tested for pathogens in line with the potable water quality norms of the host country. Table 6, page 4 of the Indian Standard drinking water specification (IS 10500:2012) prescribes that any pathogens in a 100 ml sample means that the water is not safe for drinking.</td></tr>
<tr><td>Monitoring Frequency</td><td>Annual</td></tr>
<tr><td>QA/QC Procedures</td><td>NABL accredited laboratories were contracted to carry out water quality testing.</td></tr>
<tr><td>Purpose of data</td><td>Related to water quality</td></tr>
<tr><td>Additional comment</td><td>For water purifiers monitored under VPA 5, this parameter has been calculated by accounting for the fact that if any water purifier is found to be "non-functional" during monitoring survey for “Usage" then value for “M_q” is also considered “0” as water sample cannot be collected from the household.</td></tr>
</table>

Parameter ID	**SDWS 20**
Data/parameter	Water hygiene education campaigns
Unit	-
Description	Hygiene campaigns carried out among project safe water end-users.
Source of data	Annual hygiene campaigns records
Value(s) applied	213, 233 and 233 households across Kerala states in VPA05 were selected for hygiene survey (combined survey with usage and project) were physically visited by enumerators and hygiene awareness was propagated to the households for year 2020, 2021 and 2022. The questionnaire used for survey had all the mandatory questions related hygiene. As per the survey, 93%, 94% and 95% households in VPA05 found to fulfill "basic" hygiene practices which means availability of a handwashing facility with soap and water at home. 53.05%, 50.64% and 48.5% of households in VPA05 found to fulfil "safely managed" requirement of drinking water which means drinking water from an improved water source that is accessible on premises, available when needed and free from fecal contamination Annual hygiene report with details have been submitted. Also, none of the households reported any increase in diarrhoea or any other water borne disease during the current monitoring period (year 2020, 2021 and 2022).
Measurement methods and procedures	A questionnaire-based survey has been used to assess hygienic handling of clean water as per CME knowledge and experience and WHO/UNICEF JMP core questions on drinking and hygiene.
Monitoring Frequency	Annual
QA/QC Procedures	The fraction of the households where Safe water and Hygiene practices are found to fulfill "safely managed" or "basic" requirements is expected to increase over time as a result of the hygiene campaigns.

Purpose of data	Monitoring of SDG 6
Additional comment	-

Parameter ID	**SDWS 22**
Data/parameter	$X_{cleanboil,y}$
Unit	Percentage
Description	Proportion of project end-users that boil safe (treated, or from safe supply) water after installation of project technology in year y.
Source of data	Project survey
Value(s) applied	

VPA	**Partner**	**State**	**$X_{cleanboil,y}$**
VPA 5	ESAF	Kerala	0% (Year-1)
			0% (Year-2)
			0% (Year-3)

Measurement methods and procedures	Sampling survey is carried out to determine the value
Monitoring Frequency	Annual
QA/QC Procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Parameter ID	**SDWS 24**
Data/parameter	QPW_p
Unit	Litres/person/day
Description	Volume of drinking water per person per day for premises type p
Source of data	Option 2: Water Consumption Field Tests. - In all cases, the value is capped at 5.5 L/person/day
Value(s) applied	

VPA	**Partner**	**State**	**QPW_p**
VPA 5	ESAF	Kerala	4.01(Year-1)
			4.01(Year-2)

	<table><tr><td></td><td></td><td></td><td>3.89(Year-3)</td></tr></table>
Measurement methods and procedures	The Pureit model water purifier has a capacity of 23 litres storage. At the time of surveying, the device is filled to its maximum capacity at the beginning of the day. At the end of the day, the leftover water is measured using a simple volumetric jar and the difference is taken as the water consumed per day. In case, the entire capacity of water purifier is consumed, it will be refilled for the second time to determine the actual water consumed. So, every time the filter is emptied it is again filled to its maximum capacity during the measurement day. This was done for 3 consecutive days. The average of 3 days was then divided by the total number of members in the household to get the value for the parameter. It is ensured that the survey is not done on a day when the water consumption is higher than normal days hence, weekends and festive days are avoided.
Monitoring Frequency	Annual
QA/QC Procedures	The equipment used is a simple volumetric jar with least count of 100ml which does not require any calibration nor does it have standard error values. The CME/PO conducts the survey with expert assistance. Training is provided to enumerators and testers.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Parameter ID	**SDWS 25**
Data/parameter	$HN_{p,y}$
Unit	
Description	Number of individuals per premises type p in the project boundary in year y
Source of data	Project survey/Official Government Statistics
Value(s) applied	<table><tr><th>VPA</th><th>Partner</th><th>State</th><th>Project Survey</th><th>Census</th></tr><tr><td rowspan="3">VPA 5</td><td rowspan="3">ESAF</td><td rowspan="3">Kerala</td><td>4.20 (Year-1)</td><td rowspan="3">4.2</td></tr><tr><td>4.20 (Year-2)</td></tr><tr><td>4.20 (Year-3)</td></tr></table>

Measurement methods and procedures	Project survey
Monitoring Frequency	Annual
QA/QC Procedures	CME/PO conducted surveys by training the enumerators and testers.
Purpose of data	Calculation of baseline emissions
Additional comment	According to the applied methodology, the percentages applied shall be cross-checked against at least one other source on the list. For cross-check purposes, sources applied may be up to 5 years old. In this project the cross-check document is Census data by Government of India. CME has done comparison of project survey data and census state-wise and conservative value has been used.

Parameter ID	**SDWS 28**
Data/parameter	$N_{p,y}$
Unit	Number
Description	Accumulated number of premises type p with at least one individual project technology in year y
Source of data	Sales or distribution records
Value(s) applied	<table><tr><th>VPA</th><th>Partner</th><th>State</th><th>Model</th><th>Sales</th></tr><tr><td rowspan="3">VPA 5</td><td rowspan="3">ESAF</td><td rowspan="3">Kerala</td><td rowspan="3">HUL Pureit</td><td>23,425 (Year-1)</td></tr><tr><td>23,425 (Year-2)</td></tr><tr><td>23,425 (Year-3)</td></tr></table>
Measurement methods and procedures	Sales database
Monitoring Frequency	Annual
QA/QC Procedures	Sales or distribution records to include

	i. Date of sale/distribution ii. Geographic area of sale iii. Model/type of project technology sold iv. Quantity of project technologies sold Name and telephone number, and address (if available) or other traceable indicator of premises identity and location for all end users.
Purpose of data	Calculation of baseline emissions
Additional comment	For water purifiers monitored under this VPA, this parameter has been conservatively calculated by assuming that if any water purifier is found to be "non-functional" during monitoring survey for "Usage" then value for number of members in the household is also considered "0". This has been done as a conservativeness measure in calculating emission reductions. For some of the water purifiers monitored, this monitoring parameter has been conservatively calculated by assuming that any water purifier with "installed_damaged" status as a result of the annual usage status monitoring (which is carried out annually for all CEPs in the PoA) is not working and that for these "installed_damaged" products the number of members in the household is taken as 0. This has been done despite providing monitoring results of this parameter for water purifiers with "installed_damaged" status (with minor repairable issues).

Parameter ID	**SDWS 29**
Data/parameter	$U_{p,y}$
Unit	Percentage
Description	Usage rate of the project technology by premises type p during year y
Source of data	Project Survey of the premises using a project technology to determine the usage rate of the project technology during the year.
Value(s) applied	

VPA	Partner	State	Model	Value
VPA 5	ESAF	Kerala	HUL Pureit	58.91% (Year-1)
				57.28% (Year-2)

					53.86% (Year-3)
Measurement methods and procedures	Option 1: In-person survey of project premises.				
Monitoring Frequency	Annual				
QA/QC Procedures	WCFT was used to cross check the usage percentage.				
Purpose of data	Calculation of baseline emissions				
Additional comment	-				

Parameter ID	**SDWS 30**
Data/parameter	$t_{p,y}$
Unit	Hours per day
Description	Usage time of the project technology by premises type p in year y
Source of data	Meth default
Value(s) applied	5
Measurement methods and procedures	Option 3. Default of 5 hours
Monitoring Frequency	Annual
QA/QC Procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Parameter ID	**SDWS 31**				
Data/parameter	$DP_{p,y}$				
Unit	Days				
Description	Average days the project technology is present for end-users in the premises p in year y				
Source of data	Sales or distribution records.				
Value(s) applied	**VPA**	**Partner**	**State**	**Model**	**Value**

	VPA 5	ESAF	Kerala	HUL Pureit	185 (Year-1)
					359 (Year-2)
					358 (Year-3)
Measurement methods and procedures	This is calculated as the total days from date of installation of the device to the date of end of monitoring period or entire monitoring period whichever is lesser				
Monitoring Frequency	Annual				
QA/QC Procedures	-				
Purpose of data	Calculation of baseline emissions				
Additional comment	-				

Parameter ID	**SDWS 32**
Data/parameter	$DN_{p,y}$
Unit	Number
Description	Average number of individual project technologies in each project premises type p in year y
Source of data	Sales or distribution records.
Value(s) applied	1
Measurement methods and procedures	Based on the sales or distribution records of "Quantity of project technologies sold" and identifying information of buyer/recipient, the average number of project devices per premises are calculated.
Monitoring Frequency	Annual
QA/QC Procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	-

Solar Lighting System

SDG 13

VPA05 GS11504

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	

Year	State	Total Lamps
2013	Karnataka	5517
2014	Karnataka	13052
2015	Karnataka	9683
2016	Karnataka	7981
2016	Kerala	8198
2016	Gujarat	1967
2016	Tamil Nadu	13049
2016	Odisha	973
2016	Uttar Pradesh	450
2016	Maharashtra	1826
2016	Madhya Pradesh	788
2017	Karnataka	4415
2017	Kerala	6975
2017	Gujrat	1277
2017	Tamil Nadu	9871
2017	Odisha	1929
2017	Uttar Pradesh	352
2017	Madhya Pradesh	441
2017	Assam	13384
2017	Bihar	8054
2017	Jharkhand	1005
2017	West Bengal	131
2018	Odisha	1
2018	Bihar	729
2018	Jharkhand	47
2018	Tripura	14
2018	Assam	171
2019	Odisha	1081
2019	Assam	12189
2019	Bihar	5190
2019	Jharkhand	1310
2019	Tripura	3125
2019	West Bengal	74

		Total	135249
Measurement methods and procedures	The data has been recorded in a web based tracker platform. The data consists of unique number, number of units sold, to whom and where		
Monitoring frequency	Annual		
QA/QC procedures	Each solar lighting system, and number of solar lamps in each system, has been recorded in the MEC Tracker System. Associated data resides in the MEC Tracker Database, allowing each installation to be monitored.		
Purpose of data	Calculation of project emissions		
Additional comment	-		

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

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

Additional comment	N/A

Data / Parameter	$OF_{y,i,j}$
Unit	Fraction
Description	The percentage of project lamps distributed to end users that are operating and in service
Source of data	-

Value(s) applied

Installation year	State	Value		
		Year 1	Year 2	Year 3
2013	Karnataka	83.00%	81%	79%
2014	Karnataka	83.00%	80%	77%
2015	Karnataka	84.00%	80%	78%
2016	Karnataka	84.00%	81%	79%
2016	Kerala	83.00%	81%	78%
2016	Gujarat	82.00%	80%	77%
2016	Tamil Nadu	84.00%	82%	80%
2016	Odisha	83.00%	82%	78%
2016	Uttar Pradesh	81.00%	77%	76%
2016	Maharashtra	83.00%	82%	80%
2016	Madhya Pradesh	83.00%	82%	80%
2017	Karnataka	84.00%	82%	79%
2017	Kerala	82.00%	80%	77%
2017	Gujrat	83.00%	79%	77%
2017	Tamil Nadu	81.00%	80%	77%
2017	Odisha	80.00%	81%	77%
2017	Uttar Pradesh	83.00%	80%	77%
2017	Madhya Pradesh	82.00%	81%	80%
2017	Assam	83.00%	81%	77%
2017	Bihar	82.00%	79%	77%

	2017	Jharkhand	84.00%	82%	79%
	2017	West Bengal	98.77%	96%	93%
	2018	Odisha	100.00 %	100%	100%
	2018	Bihar	83.00%	82%	81%
	2018	Jharkhand	96.77%	97%	97%
	2018	Tripura	100.00 %	100%	100%
	2018	Assam	91.95%	91%	90%
	2019	Odisha	80.00%	77%	75%
	2019	Assam	81.00%	79%	77%
	2019	Bihar	84.00%	81%	79%
	2019	Jharkhand	85.00%	83%	82%
	2019	Tripura	81.00%	80%	79%
	2019	West Bengal	97.06%	94%	91%

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	-

SDG 1

Data / Parameter	**$BSA_{Project}$**
Unit	Number
Description	Number of WPS distributed under the project as an indicator of providing basic service access to households
Source of data	Monitoring Survey Records
Value(s) applied	
Measurement methods and procedures	Monitoring and recording of number of WPS distributed under the project

VPA	WPS
VPA 05	53.61%(Year-1)
	51.98% (Year-2)
	48.56% (Year-3)

Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	SDG 1 contribution
Additional comment	-

SDG 6

Data / Parameter	**Number of beneficiaries**
Unit	Number
Description	Number of households served with safely managed water services
Source of data	Monitoring Survey Records
Value(s) applied	**VPA**: VPA05 — **WPS**: 13,068(Year-1); 12,707 (Year-2); 11,949 (Year-3)
Measurement methods and procedures	Monitoring and recording of number of WPS operational under the project
Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	SDG 6 contribution
Additional comment	-

SDG 7

Data / Parameter	$ACS_{Project}$
Unit	Number
Description	Access to affordable and clean energy (Number of operating WPS/SLS units under Project)
Source of data	WPS/SLS distribution records
Value(s) applied	**VPA**: VPA05 — **WPS**: 13,800(Year-1); 13,418(Year-2); 12,618 (Year-3) — **SLS**: 75,505(Year-1); 73,574 (Year-2); 71,297 (Year-3)
Measurement methods and procedures	Monitor the number of WPS/SLS distributed under the project as an indicator of providing reliable, clean and modern technology (relative to baseline).
Monitoring frequency	Continuous
QA/QC procedures	-
Purpose of data	SDG 7 contribution

Additional comment	-

SDG 8

Data / Parameter	**QE $IG_{project}$**
Unit	Number
Description	Quantitative Employment and income generation
Source of data	Employment records
Value(s) applied	**VPA**: VPA05 — **Net value**: 50(Year-1); 50 (Year-2); 50 (Year-3)
Measurement methods and procedures	Recording the number of employees (male / female) in the project under administrative, sales, production and management positions. Employment record with date of birth has been provided.
Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	SDG 8 contribution
Additional comment	-

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

NA. The monitoring period for the project is 27/06/2020-31/12/2020, which is the first monitoring period under GS4GG. Under CDM, CME used AMS III AV and AMS I A methodology for WPS and SLS. During transition to GS4GG, both solar and water methodologies are changed to AMS III AR and GS Safe drinking water meth version 1 respectively. Hence, for both SLS and WPS, the parameters are monitored for the first time, and there is no other data to compare. Furthermore, SDG 1, 6, 7 were not part of CDM hence there is no data to compare for monitoring period year 1. Therefore CME has compared only for monitoring period (year 2 and 3).

Data/Parameter	Value obtained in this monitoring period (2022)			Value obtained last monitoring period (2021)		
	VPA	**SLS**	**WPS**	**VPA**	**SLS**	**WPS**
SDG 13	VPA 5	6,792	21,176	VPA 5	8,188	23,240
	VPA05 – 48.56%			VPA05 – 51.98%		
SDG 1						

<table>
<tr><td>SDG 6</td><td>VPA05 – 11949</td><td>VPA05 - 12707</td></tr>
<tr><td>SDG 7</td><td><table><tr><th>VPA</th><th>SLS</th><th>WPS</th></tr><tr><td>VPA 5</td><td>71297</td><td>12618</td></tr></table></td><td><table><tr><th>VPA</th><th>SLS</th><th>WPS</th></tr><tr><td>VPA 5</td><td>73574</td><td>13418</td></tr></table></td></tr>
<tr><td>SDG 8</td><td>VPA05 - 50</td><td>VPA05 - 50</td></tr>
</table>

D.4. Implementation of sampling plan

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Sampling plan was applied to all the following VPAs included in this issuance request: VPA05 values considered.

Description of implemented sampling design

As per Section B.7.2 of the VPA-DD and the CDM standard on "Sampling and surveys for CDM project activities and programme of activities" version 9.0, the following sampling design was implemented for the VPA –

Solar Lighting System:

The following steps were taken as part of the sampling procedure for VPA5 -

1. 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).
2. 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.
3. 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.
4. Sample method – Simple random sampling has been used.
5. 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.
6. 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

Water Purification System:

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

The VPA is implemented in several state across the country. Population is homogenous within a state. Due to the homogeneity feature within the state, simple random sampling method was applied. The sample-based estimate (mean or proportion) is an unbiased estimate of the population parameter.

- **Usage/Project Survey**

For usage survey, the minimum sample size for HWT - for individual technology age group shall be minimum 30 household. The majority of interviews in a usage survey must be conducted in person. Thus, if technologies of age 1-5 are credited, the usage survey must include 30 representative samples from each age for total of 150 samples. The resulting usage parameter should be weighted based on the proportion of technologies in the total sales record of each age. For project survey, below mentioned guideline has been followed:

Group size	Minimum sample size
<300	30 or population size, whichever is smaller
300 to 1000	10% of group size
> 1000	100

CME has conducted common survey for usage and project taking into account both requirements. For e.g. VPA05, table below shows vintage split for WPS installations in Kerala (Year-3):

Vintage Year	**Total Sales**	**Required Samples**
2013	38	30
2014	14863	63
2015	2548	30
2016	5976	30
2017	38	-

- **Hygiene**

A combined usage/project and hygiene survey has been conducted for 380 households across 3 states in VPA05.

As per the survey, 94% households in VPA05 found to fulfill "basic" hygiene practices which means availability of a handwashing facility with soap and water at home. 71.35% of households in VPA05 found to fulfil "safely managed" requirement of drinking water which means drinking water from an improved water source that is accessible on premises, available when needed and free from fecal contamination Annual hygiene report with details have been submitted. Also, none of the households reported any increase in diarrhoea or any other water borne disease during the current monitoring period.

- **Water Quality**

The sample for water quality testing has been made following the 90/10 precision rule indicated by the applied methodology.

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

1. VPA05:

Parameter	**Monitoring Frequency**	**CEPs added during this MP (27/06/2020 to 31/12/2022)**	**Previous monitoring dates**	**New Monitoring for this MP**
Usage/Project Survey	Annual	No	01/07/2020 till 25/07/2020	Yes
Water testing	Annual	No	01/07/2020 till 25/07/2020	Yes

Solar Lighting System	Annual	No	28/06/2020 till 25/07/2020	Yes

Solar lighting systems: Monitoring field surveys for various parameters in this monitoring period were conducted for year 1 (26/06/2020-31/12/2020) from 28/06/2020 to 30/07//2020, year 2 (01/01/2021-31/12/2021) from 05/01/2021 to 15/02/2021 and year 3 (01/01/2022-31/12/2022) from 06/01/2022 to 15/02/2022 for solar lighting systems. Quarterly monitoring will be ongoing to determine the Lamp Failure Rate. For the next monitoring period fresh monitoring may be carried.

Water Purification System: Considering usage survey is done annually, monitoring usage surveys for various parameters in this monitoring period was conducted after end of year 1 (26/06/2020-31/12/2020) from 06/01/2021 to 15/02/2021, year 2 (01/01/2021-31/12/2021) from 05/01/2022 to 15/02/2022 and for year 3 (01/01/2022-31/12/2022) from 06/01/2023 to 15/02/2023. For next monitoring period, fresh monitoring will be carried out.

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

1. **VPA05**

Solar lighting systems (SKDRDP, Muthoot and Bandhan)

S.No.	Parameter	Sampling approach	Sample size	Comments
1	Total number of lamps checked for which a valid result was obtained	Simple random sampling for proportion-based parameter	For e.g.: **As per sample size calculation, sample size requirement for:** Assam (2019)-100	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

			Actual monitored samples for: Assam (2019)-100	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 Assam (2019), 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.

Water Purification System (Muthoot):

S.No.	Parameter	Sampling approach	Sample size
1	Cumulative usage rate for technologies in project scenario p in year y $U_{p,y}$	Simple random sampling	**ESAF** Kerala – 59
2	Modifier for the water quality in year y M_q	Simple random sampling	**ESAF** Kerala – 1
3	Volume of drinking water per person per day for premises type p (L) QPW_p	Simple random sampling	**ESAF** Kerala – 4.67

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. When the required confidence/precision is not met for any of the WPS monitored parameters, the upper or lower bound is conservatively applied to arrive at final values for the parameter as per Emission Reduction from Safe Drinking Water Supply Methodology v1.0. 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 Emission Reduction from Safe Drinking Water Supply Methodology v1.0 and CDM standard on "Sampling and surveys for CDM project activities and programme of activities version 9.0" using simple random sampling approaches.

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

SECTION E. CALCULATION OF SDG IMPACTS

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

>>

Calculations for Water Purification System and Solar Lighting Systems

SDG 13: Climate Action (WPS)

The Emission reductions are calculated as follows:

$$ERy = BEy - PEy - LEy$$

Where:

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

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

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

LEy = Leakage emissions in year y (t CO2e/yr)

The baseline emission shall be calculated as

$$BE_y = EF_b \times (1 - C_b - X_{cleanboil,y}) \times Q_y \times M_{q,y}$$

Where:

BE_y	=	Baseline emissions from the use of fuel to obtain safe water in the baseline (tCO_2e)
C_b	=	Proportion of project end-users who in the baseline were already using a safe water supply that did not require boiling (%)
$X_{cleanboil,y}$	=	Proportion of project end-users that boil safe water in the project year y (%)
Q_y	=	Quantity of safe drinking water provided by the project in year y (L)
$M_{q,y}$	=	Modifier for the water quality in year y

The baseline emission factor shall be calculated as

$$EFb = SEw,b,y * \Sigma(xf * (EFb,f,CO2 * fNRB,f,y + EFb,f,nonCO2)) \; f \div 10^9$$

Where:

EF_b	=	Emission factor for the use of fuel to obtain safe water in the baseline (tCO2e/L)
$SE_{w,b,y}$	=	Specific energy required to boil water (kJ/L), to be calculated as per the paragraph below
xf	=	Proportion of fuel f used in the baseline (fraction determined based on an energy basis)
$EF_{b,f,CO2}$	=	CO2 emission factor from use of fuel f (tCO2/TJ)
$EF_{b,f,nonCO2}$	=	Non-CO2 emission factor arising from use of fuel f, when the baseline fuel f is biomass or charcoal (tCO2e/TJ). This parameter is omitted when f is a fossil fuel.
$f_{NRB,f,y}$	=	Fractional non-renewability status of woody biomass fuel during year y (fraction). For biomass, it is the fraction of woody biomass that can be established as non-renewable. This parameter is omitted when f is a fossil fuel.

F	=	Index for baseline fuel types

The specific energy required to boil water using the baseline technology (SEw,b,y) is determined as follows, by calculating the energy input required to obtain 1 L of boiling water, including boiling and vaporization losses, taking into account default or measured stove efficiency.

$SE_{w,b,y}$ = 360.83/η_{wb}

Where:

360.83 = Default amount of energy required to obtain 1 L of water after 5 minutes of boiling from a first principles approach kJ/l

η_{wb} = Efficiency of the stoves for baseline water boiling (%). Weighted average of baseline stove types.

The quantity of safe drinking water provided by the project Qy is calculated using following method (for HWT and IWT)

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

Where:

$N_{p,y}$	=	Number of premises type p with at least one project technology in year y
$U_{p,y}$	=	Usage rate of the project technology by premises type p during year y (%)
$QPW_{hh,p,y}$	=	Volume of drinking water per premises p per day in year y (L)
$DP_{p,y}$	=	Days the project technology is present for end-users in the premises p in year y

The volume of drinking water per premises per day is determined by considering whether the capacity of the project device is sufficient to provide at least the default amount of drinking water, as follows:

$QPW_{hh,p,y}$ = min (($q_i \times t_{p,y} \times DN_{p,y}$), ($QPW_p \times HN_{p,y}$))

Where:

q_i	=	Capacity of the HWT or IWT individual project technology (L/h)
$t_{p,y}$	=	Usage time of the project technology by premises type p in year y (h/day)
$DN_{p,y}$	=	Average number of individual project technologies in each project premises type p in year y
$HN_{p,y}$	=	Number of individuals per premises type p (e.g. household, school) in year y
QPW_p	=	Volume of drinking water per person per day for premises type p (L). Apply the default value or monitored value

through water consumption field tests in the project scenario, capped at 5.5 L per person per day.

Total baseline estimates (tCO2e.) for WPS for VPA05:

Year 1	**12,300**
Year 2	**23,240**
Year 3	**21,176**

13: Climate Action: Solar Lighting Systems

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_2e	Emission reductions in year y
$N_{i,j}$	Number of project lamps	Number of project lamps distributed to end users of type *i* with charging method *j*
$BE_{y,i}$	tCO_2e	Baseline emissions per project lamp in year y
$PE_{y,i}$	tCO_2e	Project emissions per project lamp in year y
$OF_{y,i,j}$	%	Percentage of project lamps distributed to end users that are operating and in service in year *y*, for each lamp type *i* and charging method *j*. Assumed to be equal to 100 per cent for years 1, 2 and 3, and equal to the value determined in paragraph 36, for years 4, 5, 6 and 7

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

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

(Eq. 3)

Parameter	Unit	Value
BE_y	tCO_2e	Baseline emissions per project lamp in year y
DV	tCO_2e per project lamp	Lamp Emission Factor (default is 0.092

		tCO_2e per project lamp)
GF_y	-	Grid Factor in year y, • Equal to 1.0 when charging option defined in paragraph 3(a) is used; • Equal to 1.0 if the project activity is for off-grid households/communities (defined as no grid access or less than 12 hours grid availability per day on an annual average basis); • Otherwise it is equal to 1.0 minus (the fraction of time grid is available to the target households and communities/users in the region of project activity)
DB_y	-	Dynamic Baseline Factor (change in baseline fuel, fuel use rate, and/or utilization during crediting period) in year y. Calculated as either: • Option 1: default of 1.0 in the absence of relevant information; • Option 2: value of 1.0+FFg where FFg is the documented national growth rate of kerosene fuel use in lighting from the preceding years (use the most recent available data for a three or five years average fraction)

In line with paragraph 29 of the methodology, there are no project emissions as the project lamp charging mechanism utilizes a renewable energy system (solar photovoltaic panel) included as part of the project lamp. Thus,

$PE_{y,i} = 0$

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

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

(Eq. 2)

Parameter	Unit	Value
DV	tCO_2e per project lamp	Lamp Emission Factor (default is 0.092 tCO_2e per project lamp)
FUR	liters/hour	Fuel use rate (0.03 liters/hour)
O	hours/day	Utilization rate (3.5 hours/day)

U	days/year	Annual utilization (365 days/year)
EF	$kgCO_2$/liter	Fuel emissions factor (2.4 $kgCO_2$/liter)
LF	-	Leakage factor (1.0)
n	-	Number of fuel-based lamps replaced per project lamp (1.0)
NTG	-	Net-to-gross adjustment factor (1.0)

Total baseline estimates for SLS for VPA05:

Year 1	**4694**
Year 2	**8188**
Year 3	**6792**

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

SDG 1: No Poverty

$BSA_{Baseline}$ Access to basic services (safe water) for VPA05 = 5.30% (Year 2020)
5.30% (Year 2021)
5.30% (Year 2022)

SDG 6: Clean Water and Sanition

$HHTS_{Baseline}$ Number of households served with safely managed water services
= 0 (Year 2020)
0 (Year 2021)
0 (Year 2022)

SDG 7: Affordable and Clean Energy

$ACS_{Baseline}$ Access to affordable and clean energy (Number of operating WPS/SLS units under Baseline) = 0 (Year 2020)
0 (Year 2021)
0 (Year 2022)

SDG 8: Decent Work and Economic Growth

$QE\ IG_{Baseline}$ Quantitative Employment and income generation (Number of person (male and female) hired under Baseline) = 0 (Year 2020)
0 (Year 2021)
0 (Year 2022)

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

>>

SDG 13: Climate Action

As the project envisage implementation of solar lamp and gravity based water filter, thus eliminating the usage of kerosene and traditional stove for boiling water, project estimate/emissions are considered 0.

SDG 1: No Poverty

$BSA_{Project}$ Percentage of households having access to basic services in baseline for VPA05 = 58.91% (Year 2020)
VPA05 = 57.28% (Year 2021)
VPA05 = 53.86% (Year 2022)

SDG 6: Clean Water and Sanitation

Net Benefit (SDG 6) = $N_{p,y} * (1-C_b)*U_{p,y}*M_{q,y}$
Number of households served with satisfactory level of safe water for VPA05 =
13,068 (Year 2020)
12,707 (Year 2021)
11,949 (Year 2022)

SDG 7: Affordable and Clean Energy

VPA05
$ACS_{Project}$ Access to affordable and clean energy (Number of operating WPS units under Project) = 13,800 (Year 2020)
13,418 (Year 2021)
12,618 (Year 2022)

Access to affordable and clean energy (Number of operating SLS units under Project) = 75,505 (Year 2020)
73,574 (Year 2021)
71,297 (Year 2022)

SDG 8: Decent Work and Economic Growth

QE $IG_{Project}$ Quantitative Employment and income generation (Number of person (male and female) hired under Project) for VPA05 = 50 (Year 2020)
50 (Year 2021)
50 (Year 2022)

E.3. Calculation of leakage

>>

Leakage for solar in the VPA = 0

Leakage for water in the VPA = 5%

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

Year 1: 2020

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
13	Climate Action (SLS)	VPA05- 4,694	0	VPA05- 4,694
13	Climate Action (WPS)	VPA05- 12,300	0	VPA05- 12,300
1	No poverty (WPS)	VPA05-5.30%	VPA 05- 58.91%	VPA 05-53.61%
6	Clean Water and Sanitation (WPS)	0	VPA 05- 13,068	VPA 05- 13,068
7	Affordable and Clean Energy (WPS)	0	VPA 05- 13,800	VPA 05- 13,800
7	Affordable and Clean Energy (SLS)	0	VPA 05-75,505	VPA 05- 75,505
8	Decent Work and Economic Growth	0	VPA 05- 50	VPA 05- 50

Year 2: 2021

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
13	Climate Action (SLS)	VPA05- 8,188	0	VPA05- 8,188

13	Climate Action (WPS)	VPA05- 23,240	0	VPA05- 23,240
1	No poverty (WPS)	VPA05-5.30%	VPA 05-57.28%	VPA 05-51.98
6	Clean Water and Sanitation (WPS)	0	VPA 05- 12,707	VPA 05- 12,707
7	Affordable and Clean Energy (WPS)	0	VPA 05- 13,418	VPA 05- 13,418
7	Affordable and Clean Energy (SLS)	0	VPA 05-73,574	VPA 05- 73,574
8	Decent Work and Economic Growth	0	VPA 05- 50	VPA 05- 50

Year 3: 2022

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
13	Climate Action (SLS)	VPA05- 6,792	0	VPA05- 6,792
13	Climate Action (WPS)	VPA05- 21,176	0	VPA05- 21,176
1	No poverty (WPS)	VPA05-5.30%	VPA 05-53.86%	VPA 05-48.56%
6	Clean Water and Sanitation (WPS)	0	VPA 05- 11,949	VPA 05- 11,949
7	Affordable and Clean Energy (WPS)	0	VPA 05- 12,618	VPA 05- 12,618
7	Affordable and Clean Energy (SLS)	0	VPA 05- 71,297	VPA 05- 71,297

8	Decent Work and Economic Growth	0	VPA 05- 50	VPA 05- 50

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

Year 1: 2020

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values[5] achieved during this monitoring period
13 (SLS)	VPA 5- 6,409	VPA5- 4,694
13 (WPS)	VPA 5- 17,227	VPA 5- 12,300
1	VPA 5- 94.70%	VPA 5- 53.61%
6	VPA 5- 13,088	VPA 5- 13,068
7	**WPS** VPA 5- 23,425	VPA 5- 13,800
7	**SLS** VPA 5- 91,245	VPA 5- 75,505
8	VPA 5- 20	VPA 5- 50

Year 2: 2021

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values[6] achieved during this monitoring period

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

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

13 (SLS)	VPA 5- 62,215	VPA5- 8,188
13 (WPS)	VPA 5- 1,67,227	VPA 5- 23,240
1	VPA 5- 94.70%	VPA 5- 51.98%
6	VPA 5- 13,088	VPA 5- 12,707
7	**WPS** VPA 5- 23,425	VPA 5- 13,418
7	**SLS** VPA 5- 91,245	VPA 5- 73,574
8	VPA 5- 20	VPA 5- 50

Year 3: 2022

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values[7] achieved during this monitoring period
13 (SLS)	VPA 5- 62,215	VPA5- 6,792
13 (WPS)	VPA 5- 1,67,227	VPA 5- 21,176
1	VPA 5- 94.70%	VPA 5- 48.56%
6	VPA 5- 13,088	VPA 5- 11,949

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

7	**WPS** VPA 5- 23,425	VPA 5- 12,618
7	**SLS** VPA 5- 91,245	VPA 5- 71,297
8	VPA 5- 20	VPA 5- 50

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

>>

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

To achieve a comparable value of estimates for this monitoring period for VPA5, these are the factors/values considered:

Since both technologies (water purifier and solar lighting systems) are implemented in these VPAs are implemented total value ex ante emission reduction is used for estimation. The monitoring period is spanning across CP-2 (20/04/2020 to 19/04/2025). Total ex ante estimated value for Year-1 of CP-2 (27/06/2020 to 31/12/2020), Year-2(01/01/2021 to 31/12/2021) and Year-3 (01/01/2022 to 31/12/2022) of CP-2 of operation of the VPAs from start date of crediting period is considered. Current monitoring period (26/07/2020 to 31/12/2022) falls between CP-2 Year-1, Year-2 and Year-3 of the crediting period

- The estimation of ex ante value is made for 188 days (Year 1-CP2 i.e. 27/06/2020 to 31/12/2020), 365 days (Year 1-CP2 and Year 2 CP2 i.e. 01/01/2021 to 31/12/2021) and 365 days (Year 2 CP2 and Year 3 CP2 i.e.

01/01/2022 to 31/12/2022) totaling to 918 days (which is crediting days for this monitoring period[8].

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 ESAF, Muthoot, SKDRDP and Bandhan (Nakshi). 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 ESAF and Muthoot have been submitted to VVB.
Measurement methods and procedures	The employment contract is checked to ensure compliance with Principle 6.1
Monitoring frequency	Annual
QA/QC procedures	-
Purpose of data	For Safeguarding Principle 6.1

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

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 ESAF staffs, if any waste scrap disposal happened in the current monitoring. For the current monitoring period, ESAF 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 (27/06/2020 to 31/12/2022), no grievance was received.

Method	Include all details of Chosen Method (s) so that they may be understood and, where relevant, used by readers.
Continuous Input / Grievance Expression Process Book (mandatory)	Continuous input / Grievance Expression process book is available at the office at local partner offices. By maintaining feedback book at the local office, it is ensured that stakeholders that don't have access to electronic media for expressing concerns / grievances are also able to share their concerns / feedback. Additionally, the end users always have an option to contact the

	partner organization (representative of MFI/ manufacturers etc.) in case of any feedback / complaints with the product post distribution.
GS Contact (mandatory)	help@goldstandard.org
Other	Email: skdrdp@skdrdpindia.org; info@cedarretail.in; info@muthoot.com; customercare@bandhanbank.com

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 (27/06/2020 to 31/12/2022).

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

>>

There was no legal contest due to the project or against the project during the monitoring period. Project is in compliance with the Host Country's legal, environmental, ecological, and social regulation. Additionally, no dispute has arisen with any other party and has not reported any challenges related to the same in the current monitoring period (27/06/2020 to 31/12/2022).

Revision History

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