Verification report form for GS4GG Programme of Activity (Gold Standard for the Global Goals)		
BASIC INFORMATION		
Title of the GS4GG Programme of Activity (PoA)	PoA GS ID: 11450 MicroEnergy Credits – Microfinance for Clean Energy Product Lines - India	
Reference number of the Programmes of Activity (PoA)	GS 11450	
Version number of the verification and certification report	1.0	
Completion date of the verification and certification report	05/10/2023	
GS ID (s) of VPAs under PoA	VPA Ref. no.	Title
	GS 11504	GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - CPA 05–GS11504
Version number of the monitoring report to which this report applies	2	
Completion date of the monitoring report to which this report applies	21/09/2023	
Monitoring period no. and duration	1st MP (VPA 5) 27/06/2020 to 31/12/2022 (inclusive of both the dates) Monitoring period falls under crediting period CP 2: 20/04/2020 to 19/04/2025	
Project Representative	Micro Energy Credits Corporation Private Limited	
Host Party	India	
Applied methodologies and standardized baselines	AMS III A.R "Substituting fossil fuel-based lighting with LED/CFL lighting systems" v 7.0 Emission reduction from safe drinking water supply-version 1.0	
Activity requirements applied	☒ Community Services Activities ☐ Renewable Energy Activities ☐ Land Use and Forestry Activities/Risks &	

	Capacities ☐ N/A
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A
Estimated amount of annual average GHG emission reductions	WPS: VPA 5 – 84,117 tCO_2e SLS: VPA 5 – 31,295 tCO_2e

Year 1: 2020

Sustainable Development Goals Targeted	SDG Impact	Total amount of certified SDG impact (as per approved methodology) achieved in this monitoring period (VPA-5)		Units/Products
		Estimated	Achieved	
SDG 13: Climate Action	Number of VER's (SLS)	6,409	4,694	tCO_2e VERs
	Number of VER's (WPS)	17,227	12,300	tCO_2e VERs
	Number of VER's (WPS+SLS)	32,186	16,994	tCO_2e VERs
SDG 1: No Poverty	Proportion of population living in households with access to basic services (only for water)	94.70%	53.61%	Percentage
SDG 6: Clean water and Sanitation	Number of households served with safely managed water services	13,088	13,068	Number
SDG 7: Affordable and Clean Energy	Number of households having operational WPS	23,425	13,800	Number of WPS
	Number of households having operational SLS	91,245	75,505	Number of SLS
SDG 8: Decent Work and Economic Growth	Quantitative Employment and income generation	20	50	Number

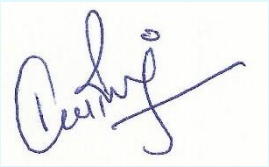
Year 2: 2021

Sustainable Development Goals Targeted	SDG Impact	Total amount of certified SDG impact (as per approved methodology) achieved in this monitoring period (VPA-5)		Units/Products
		Estimated	Achieved	
SDG 13: Climate Action	Number of VER's (SLS)	12,443	8,188	tCO_2e VERs
	Number of VER's (WPS)	33,445	23,240	tCO_2e VERs
	Number of VER's (WPS+SLS)	45,888	31,428	tCO_2e VERs
SDG 1: No Poverty	Proportion of population living in households with access to basic services (only for water)	94.70%	51.98%	Percentage
SDG 6: Clean water and Sanitation	Number of households served with safely managed water services	13,088	12,707	Number
SDG 7: Affordable and Clean Energy	Number of households having operational WPS	23,425	13,418	Number of WPS
	Number of households having operational SLS	91,245	73,574	Number of SLS
SDG 8: Decent Work and Economic Growth	Quantitative Employment and income generation	20	50	Number

Year 3: 2022

Sustainable Development Goals Targeted	SDG Impact	Total amount of certified SDG impact (as per approved methodology) achieved in this monitoring period (VPA-5)		Units/Products
		Estimated	Achieved	
SDG 13: Climate Action	Number of VER's (SLS)	12,443	6,792	tCO_2e VERs
	Number of VER's (WPS)	33,445	21,176	tCO_2e VERs
	Number of VER's (WPS+SLS)	45,888	27,969	tCO_2e VERs
SDG 1: No Poverty	Proportion of population living in households	94.70%	48.56%	Percentage

	with access to basic services (only for water)			
SDG 6: Clean water and Sanitation	Number of households served with safely managed water services	13,088	11,949	Number
SDG 7: Affordable and Clean Energy	Number of households having operational WPS	23,425	12,618	Number of WPS
	Number of households having operational SLS	91,245	71,297	Number of SLS
SDG 8: Decent Work and Economic Growth	Quantitative Employment and income generation	20	50	Number

Name and UNFCCC reference number of the VVB	Earthood Services Private Limited E-0066
Name, position and signature of the approver of the verification report	 Dr. Kaviraj Singh Managing Director

SECTION A. Executive summary

The GS programme of activity "MicroEnergy Credits – Microfinance for Clean Energy Product Lines - India" (PoA GS 11450) aims to replacement of fossil fuel consumption and the resultant GHG emission with a clear and sustainable technology which will lead to reduced GHG emissions. CME archives this through dissemination of Improved Cookstove (ICS), Solar lighting systems (SLS) and Water Purification System (WPS) in households/facilities of rural areas in various states of India. The PoA is using carbon finance to support local partners engaged in different activities like production, distribution, and maintenance of various product technologies like ICS, SLS and WPS. The VPAs main target is on reduction of greenhouse gas emissions from the burning of non-renewable woody biomass and/or charcoal for cooking and boiling of water for drinking purpose. Improved Cookstoves (ICS) improve heat transfer efficiency as compared to the baseline conventional there stone fired stoves, and thereby reducing GHG emissions, The water purification systems also reduce the dependency of boiling water using non-renewable woody biomass, thereby reducing the GHG emissions from the burning of non-renewable woody biomass and/or charcoal for treating the water, and solar lighting systems results in fulfilment of lighting needs through a renewable source (solar energy), thus replacing the baseline scenario with the project activity will lead to reduction in GHG emissions and fulfilling the requirements of the applied methodologies AMS-III. AR "Substituting fossil fuel-based lighting with LED/CFL lighting systems" version 7/08/, and Emission reduction from safe drinking water supply-version 1.0/09/ respectively.

The VPA's are being submitted to GS4GG for Verification are as follows:

Parameter	Validated information
GS ID of the VPAs to be included	GS 11504 (VPA 5)
Title of the VPAs	GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - CPA 05 - GS11504.
Methodology applied	• AMS-III AR "Substituting fossil fuel-based lighting with LED/CFL lighting systems" version 7. • Emission Reduction from safe drinking water supply v1.0
Crediting period	5 years, Renewable twice, total 15 years of crediting period. CP 1: 07/12/2016 to 06/12/2021, CP 2: 07/12/2021 to 06/12/2026

The VPAs aim at dissemination of water purification system and solar lighting system in various states of India and is being implemented by MicroEnergy Credits Corporation Private Limited's Partner Organizations (PO) and coordinated by Micro Energy Credits Corporation Private Limited (MEC). The VPA's aims at GHG emission reductions through displacement of fossil fuel use with water purification system and solar lighting systems (WPS and SLS) to meet the safe drinking water and electric demands of facility/household. The households in rural areas of India traditionally use fossil fuels which includes charcoal, kerosene, LPG, diesel, wood, and coal intensive grid for fulfilling their energy demands. The baseline scenario under the VPA's is the replacement of fossil fuel burning to meet the demand of safe drinking water with the water purification system thereby reducing the amount of fuelwood used for boiling purposes in the baseline. Also, the distribution of solar lighting systems replaces the kerosene-based lamps in households, which would have resulted in GHG emissions due to burning of kerosene.

The PoA has been registered under GS4GG (GSID 11450). The CME of the PoA is Micro Energy Credits Corporation Private Limited and the project is being implemented with the help of MEC's PO. Solar lighting systems are implemented by Shri Kshetra Dharamsthala Rural Development Project (SKDRDP), Bandhan Microfinance, and Muthoot Microfin Ltd. The water purification system is implemented by Evangelical Social Action Forum (ESAF).

The Monitoring period covered under this verification is 27/06/2020 to 31/12/2022 (inclusive of both the dates) for the VPA 5. The VPA 5 i.e., GS 11504 /02/ envisage an archived annual GHG emission reduction and other SDG impacts over the crediting period as given in the table below.

Year 1: 2020

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
13 Climate Action (mandatory)	Number of VERs	16,994	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)	53.61%	Percentage
6 Clean Water and Sanitation	Number of households served with safely managed water services	13,068	Number
7 Affordable and Clean Energy	Number of households having operational WPS	13,800	Number
7 Affordable and Clean Energy	Number of households having operational SLS	75,505	Number
8 Decent Work and Economic Growth	Quantitative Employment and income generation	50	Number

Year 2: 2021

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
13 Climate Action (mandatory)	Number of VERs	31,428	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)	51.98%	Percentage
6 Clean Water and Sanitation	Number of households served with safely managed water services	12,707	Number
7 Affordable and Clean Energy	Number of households having operational WPS	13,418	Number

7 Affordable and Clean Energy	Number of households having operational SLS	73,575	Number
8 Decent Work and Economic Growth	Quantitative Employment and income generation	50	Number

Year 3: 2022

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
13 Climate Action (mandatory)	Number of VERs	27,969	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)	48.56%	Percentage
6 Clean Water and Sanitation	Number of households served with safely managed water services	11,949	Number
7 Affordable and Clean Energy	Number of households having operational WPS	12,618	Number
7 Affordable and Clean Energy	Number of households having operational SLS	71,298	Number
8 Decent Work and Economic Growth	Quantitative Employment and income generation	50	Number

Scope of Verification

The verification is an independent and objective review for determination of the monitored reductions in GHG emissions by the VVB. The verification includes the implementation and operation of the PoA as set out in the registered PoA-DD/01/ & registered VPA-DD/02/ for VPA 05 in the monitoring period.

The verification tests the data and assertions set out in the monitoring report prepared for this monitoring period, and it is based on the review of the following:

(i) The approved methodology AMS-III.AR "Substituting fossil fuel based lighting with LED/ CFL lighting systems", version 7.0/08/ and Emission reduction from safe drinking water supply-version 1.0/09/
(ii) The registered PoA-DD/01/ & registered VPA-DDs/02/ and monitoring plan/02/
(iii) UNFCCC criteria referred to in the Kyoto Protocol criteria and the CDM modalities and procedures as agreed in the Bonn Agreement and the Marrakech Accords
(iv) GS4GG requirements
(v) The CDM Validation and Verification Standard (VVS) version 3.0/22/ and The CDM Project Standard (PS) version 3.0/21/
(vi) Relevant decisions, guidance, and clarifications of the CMP and CDM Executive Board and any other information and references relevant to the project activity's reported emission reductions
(vii) GS review of validation of PoA and VPAs

The verification has considered both the quantitative and qualitative aspects on stated/reported emission reductions. The monitoring report (all versions) and corresponding supporting documentation was assessed in accordance with the rules defined by UNFCCC and GS4GG, as appropriate to the PoA. The verification is not meant to provide any consulting or recommendations to the PP/others. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the monitoring activities.

Verification Process

The verification process is conducted as per internal GS4GG Requirements, which includes the following steps;

a) Contract with PP and appointment of verification team and technical review team (refer Section B.1 and B.2 of this report)
b) Desk review (refer Section D.1 of this report) of Monitoring Report and corresponding ER sheet by verification team and remote audit (including sampling approach (refer Section D.4 of this report) to be applied)
c) Onsite audit (refer Section D.2 of this report) by verification team consistent of Team Leader and all Technical Experts, as a minimum
d) Follow up activities e.g., interviews (refer Section D.3 of this report)
e) Reporting and closure of findings (CARs/CLs/FARs) and preparation of draft verification report (refer Section D.5 of this report)
f) Independent technical review (refer Section B.2 of this report) of the draft verification report and final/revised documentation (e.g., Monitoring Report, corresponding ER sheet and evidences)
g) Reporting and closure of TR comments/findings (refer Section D.5 of this report) (CARs/CLs/FARs) and final approval for the decision made (refer Section G and H of this report).
h) Issuance of final verification report to contracted PP (or authorized representatives) and submission of request for issuance, as appropriate.

Verification Conclusion

The review of the monitoring report, supporting documentation and subsequent follow up actions have provided ESPL with sufficient evidence to determine the fulfilment of stated criteria. Earthood is of the opinion that the PoA "MicroEnergy Credits – Microfinance for Clean Energy Product Lines - India" (GS ID: 11450) meets all the GS requirements and has correctly applied the GS approved methodologies AMS-III.AR "Substituting fossil fuel-based lighting with LED/ CFL lighting systems" version 7.0/08/ and Emission reduction from safe drinking water supply-version 1.0/09/ respectively.

The GHG emission reductions were calculated correctly based on the approved methodologies AMS-III.AR "Substituting fossil fuel-based lighting with LED/ CFL lighting systems" version 7.0/08/ and Emission reduction from safe drinking water supply-version 1.0/09/ and and the monitoring plan contained in the registered PoA-DD/01/ and VPA-DDs /02/.
Earthood Services Private Limited can certify that the emission reductions achieved in the monitoring period 27/06/2020 to 31/12/2022 (inclusive of both the dates) for the VPA 05 by GS PoA "MicroEnergy Credits – Microfinance for Clean Energy Product Lines - India" (GSID: 11450) amount to 76,390 (CP2 – year 1,2 and 3) tCO_2e for VPA 05. Therefore, this is being submitted for request for issuance, as per GS4GG and UNFCCC procedures.

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team member

No.	Role	FY	Last name	First name	Affiliation	Involvement in

					(e.g. name of central or other office of VVB or outsourced entity)	Desk/document review	On-site inspection*	Interview(s)	Verification findings
1.	Team Leader	IR	Phukan	Sukanya	Central Office	Y	Y	Y	Y
2.	GS approved auditor	IR	Varshney	Divij	Central Office	Y	Y	Y	Y
3.	Technical Expert (TA 1.2, 3.1)	IR	Phukan	Sukanya	Central Office	Y	Y	Y	Y
4.	Local Expert	IR	Phukan	Sukanya	Central Office	Y	Y	Y	Y
5.	Trainee (Verifier)	IR	Yadav	Vaishali	Central Office	Y	N	N	Y

*On – site interviews have been conducted for the current verification and the same has been discussed in detail in section D.2 of the report.

The team composition for the verification with their roles is included in table mentioned.

B.2. Technical reviewer and approver of the verification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of VVB or outsourced entity)
1.	Technical reviewer and TA expert (TA 3.1 & 1.2) to TR	IR	Garg	Shreya	Central Office
2.	Approver	IR	Singh	Kaviraj	Central Office

SECTION C. Application of materiality in conducting the verification

C.1. Consideration of materiality in planning the verification

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Erroneous transfer of information from documented records (sales receipt, carbon transfer form etc.) to credit tracker platform	Low	POs contracted by PP enters the details in credit tracker platform at the time of installation. POs also conduct an internal check to verify the accuracy of data entry.	On a sampling basis, the records are checked with the information from the credit tracker platform and substantiated by questions asked during the remote surveys of end-users. The familiarity of PO representatives with

				the tracker platform is also checked.
2.	Erroneous consideration of technical specifications of CEPs (especially for solar CEPs)	Low	The technical specifications are provided by the manufacturer.	Technical specifications of each CEP model are checked against the document issued by the manufacturer.
3.	Observational error by monitoring survey staff of PP/CPA implementer while recording the responses of users in relation to survey parameters	Low	Other than monitoring surveys, the CEP usage status-check surveys are also conducted regularly for distributed CEP. Therefore, risk of error is low. However, if there are discrepancies, they are to be dealt with as per the acceptance sampling approach.	If the aggregated materiality threshold stays within the prescribed materiality threshold, no additional effort is required. However, if the aggregated materiality threshold is above the prescribed threshold, additional samples are to be inspected. If additional sampling is not able to reduce the materiality threshold to a reasonable level of assurance, the monitoring result by the PP for that parameter is to be discarded.
4.	Calculation and referencing errors in ER sheet	Low	The ER calculations are cross-checked by using two different methods of calculation and comparing the results, therefore occurrence of error is less likely. However, referencing errors within the ER sheet may occur.	All calculations and referencing will be checked by verification team with respect to applicable requirements under various documents viz., methodology, PoA DD, CPA DD etc.

C.2. Consideration of materiality in conducting the verification

In accordance with CDM VVS for PoAs, Version 03.0/22/ the prescribed thresholds for materiality for CDM PoAs are as under:

The applicable materiality threshold is 2.0% as PoA comprises Large-scale VPAs

Particulars / Monitoring Report	**MR Version (Initial)**	**MR Version (Revised/Final)**
Emission Reductions Achieved (tCO_2e) in this monitoring period	2,19,016	80,890
Applicable Threshold (%) as per CDM VVS for PoAs Version 03.0	2.0%	2.0%

During the assessment all findings were closed and from the sample selected for verification, no systemic or systematic material errors were identified which would have an impact on total emission reductions from the entire population.

SECTION D. Means of verification

D.1. Desk/document review

The verification of the information of the PoA was performed through the document review including review of monitoring report /40/ version 2 dated 21/09/2023. Additionally, cross checks were performed for information provided in the monitoring report using other source of information, the verification team's sectoral or local expertise and, if necessary, independent background investigations.

The desk review involves:

- A review of the data and information presented to verify their completeness.
- A review of the monitoring plan, the monitoring methodologies including applicable tool(s) and, where applicable, the applied standardized baseline, paying attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures.
- A review of calculations and assumptions made in determining the GHG data and emission reductions.
- An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

The list of documents reviewed during the verification is provided under appendix 3 of this report.

D.2. On-site inspection

Duration of on-site inspection: 26/05/2023 – 29/05/2023				
No.	Activity performed on-site	Site location	Date	Team member
1.	Physical site visit: Households visited (Implementation of PoA)	India	26/05/2023 – 29/05/2023	Sukanya Phukan
2.	Review of information flows for generating, aggregating and reporting the monitoring parameters	India	26/05/2023 – 29/05/2023	
3.	Cross check between information provided in the monitoring report and data from other sources such as plant logbooks, inventories, purchase records or similar data sources;	India	26/05/2023 – 29/05/2023	
4.	A check of the monitoring equipment including calibration performance and observations of monitoring practices against the applicable requirements	India	26/05/2023 – 29/05/2023	
5.	Identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or	India	26/05/2023 – 29/05/2023	

	omissions in the reported monitoring parameters			

D.3. Interviews

D.3.1. Interviews with PP and VPA Implementers

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Singh	Darshna	MEC India	26/05/2023 – 29/05/2023	VPA DD description, Additionality, Baseline identification, Project boundary, Ex-ante and Ex-post parameters	Sukanya Phukan, Divij Varshney
2.	Ranjan	Shreejit	MEC India		VPA DD description, Additionality, Baseline identification, Project boundary, Ex-ante and Ex-post parameters	
WPS End-users for VPA 5*						
1	R	Rajisha	End User	26/05/2023 – 29/05/2023	VVB Project Survey	Sukanya Phukan
2	Devi N	Rema	End User	26/05/2023 – 29/05/2023	VVB Project Survey	Sukanya Phukan
3	Akbar	Haseena	End User	26/05/2023 – 29/05/2023	VVB Project Survey	Sukanya Phukan
4	P	Sunitha	End User	26/05/2023 – 29/05/2023	VVB Project Survey	Sukanya Phukan
5	V	Radha	End User	26/05/2023 – 29/05/2023	VVB Project Survey	Sukanya Phukan
6	Chandrasekharan	Saritha	End User	26/05/2023 – 29/05/2023	VVB Project Survey	Sukanya Phukan
7	Manikandan	Anitha	End User	26/05/2023 – 29/05/2023	VVB Project Survey	Sukanya Phukan
8	Narayanan	Nalini	End User	26/05/2023 – 29/05/2023	VVB Project Survey	Sukanya Phukan
9	Kajahussain	Fajeela	End User	26/05/2023 – 29/05/2023	VVB Project Survey	Sukanya Phukan
10	Balan	Saraswathi	End User	26/05/2023 –	VVB Project Survey	Sukanya Phukan

				29/05/2023		
11	M	Sreekala	End User	26/05/2023 – 29/05/2023	VVB Project Survey	Sukanya Phukan
SLS End-users for VPA 05						
1	-	Sajna	End User	26/05/2023 – 29/05/2023	VVB Project Survey	Divij Varshney
2	-	Ancy	End User	26/05/2023 – 29/05/2023	VVB Project Survey	Divij Varshney
3	D	Raji	End User	26/05/2023 – 29/05/2023	VVB Project Survey	Divij Varshney
4	D	Saranya	End User	26/05/2023 – 29/05/2023	VVB Project Survey	Divij Varshney
5	M.P	Arya Mohan	End User	26/05/2023 – 29/05/2023	VVB Project Survey	Divij Varshney
6	C.S	Aswathy	End User	26/05/2023 – 29/05/2023	VVB Project Survey	Divij Varshney
7	L	Santhi	End User	26/05/2023 – 29/05/2023	VVB Project Survey	Divij Varshney
8	L	Medona	End User	26/05/2023 – 29/05/2023	VVB Project Survey	Divij Varshney
9	-	Mikhelamma	End User	26/05/2023 – 29/05/2023	VVB Project Survey	Divij Varshney
10	-	Akhila	End User	26/05/2023 – 29/05/2023	VVB Project Survey	Divij Varshney
11	J	Jesil	End User	26/05/2023 – 29/05/2023	VVB Project Survey	Divij Varshney

*Sales of the CEPs are primarily made to females as females are primarily involved in kitchen handling and boiling water. The end users are mostly females an while carrying out the onsite audit random sampling method is used. Hence, the interviewed end users are all female.

Type of questions asked by VVB to VPA Implementers:

Following questions are asked by the end-users for the verification of samples:

No.	Questions asked by Team Leader to baseline users	Nature of Responses Received
Question asked for Water Purification System end user.		
1.	What is the Household Name?	Positively responded
2.	What is the Location/Address (Village name, Pin code)?	Positively responded
3.	What is the Branch, District, State?	Positively responded
4.	What is your Product Model?	Positively responded
5.	What is the Installation Date?	Positively responded
6.	What is the Unique ID of CEP?	Positively responded

7.	What is the Total Quantity of each Product Type?	Positively responded
8.	Is the product in use/operational?	Positively responded
9.	Is device using electricity/energy to operate?	Positively responded
10.	What was the baseline device in use?	Positively responded
11.	What is your source of water? (does PDN exist)?	Positively responded
12.	Is the source rendering SDW?	Positively responded
13.	How much time does it take to fetch the water and return home? (in Minutes)	Positively responded
14.	Who does usually fetch the water (Male/female/child)?	Positively responded
15.	How did you make your drinking water safe in baseline? (record baseline device)	Positively responded
16.	Do you know when to change/replace the filter element in the device?	Positively responded
17.	Quantity of water filled into the filter/ day. (Liters/ number of refills in a day)	Positively responded
18.	Number of Person in the HH?	Positively responded
19.	Any Water - borne disease reported by the filter water consumption?	Positively responded
20.	Does the household also include distributed ICS?	Positively responded
21.	Is your sampled HH also surveyed by PP?	Positively responded
Questions asked for Solar lighting system end users.		
1.	What is the Household Name?	Positively responded
2.	What is the Location/Address (Village name, Pin code)?	Positively responded
3.	What is the Branch, District, State?	Positively responded
4.	What is your Product Model?	Positively responded
5.	What is the Installation Date?	Positively responded
6.	What is the Unique ID of CEP?	Positively responded
7.	What is the Total Quantity of each Product Type?	Positively responded
8.	Is the product in use/operational?	Positively responded
9.	Is device using electricity/energy to operate?	Positively responded
10.	What was the baseline device in use?	Positively responded
11.	Lumen output	Positively responded
12.	Wattage	Positively responded
13.	How many lamps did you receive?	Positively responded
14.	How many lamps are operational?	Positively responded
15.	Does the household also include distributed ICS?	Positively responded
16.	Is your sampled HH also surveyed by PP?	Positively responded

All the end-users reported that the product is working satisfactorily, and they feel that there has been an improvement in the indoor air quality in case of SLS and WPS. All the end users also reported that they are aware of the grievance mechanism. No adverse or negative responses were received with regards the usage or convenience of use of WPS.

D.4. Sampling approach

VVB's sampling plan:
In order to meet the requirements of Standard for Sampling and surveys for CDM project activities and programmes of activities /23/, the verification team applied acceptance sampling in the verification (in accordance with para 28). The verification team selected random samples of PP's sampled records, checked the acceptability (or otherwise) of the data for each such record with PP's sample records, and then based on the number of records where there is an agreement, determined if the PP's sample records meet the requirements.

The verification team determined the sample size for acceptance sampling by evaluating the following, using its own professional judgment and guidance in the Standard 'Sampling and surveys for CDM project activities and programme of activities' /24/:

- The proportion of discrepancies between the PP's data and verification team's (field or onsite inspection results) data that can be considered acceptable. This is referred to as the AQL (Acceptable Quality Level): 0.5% was considered in this verification.
- The proportion of discrepancies between the PP's data and verification team's (field or onsite inspection results) data that would be considered unacceptable. This is the UQL (Unacceptable Quality Level): 20% was considered in this verification.
- The producer risk: 10% was considered.
- The consumer risk: 10% was considered.

Considering the above input values, a sample size of 11 was required as per Table (Sample size and acceptance number based on AQL, UQL, and producer and consumer risks) in the referred Standard /23/. Accordingly, the acceptance number (c) thus determined for the sample size is 0. A sample size of 11 for each technology of each VPA meets the criteria. The samples to be surveyed by assessment team were randomly selected from the list of monitored samples using the random sample generator on Microsoft excel. The audit plan and list of samples thus obtained to be surveyed by assessment team was communicated to PP via email.

The current verification is for GS 11450 (VPA 5). In this monitoring period, following was observed:

GS Ref. VPA	Measure/Technology	Unique CEPs at the end of current MP[1]	Incremental CEPs distribution ?	Fresh/New Monitoring by PP in the MP?
GS11504	Water Purification System	23,425	No	Yes
	Solar Lighting System	91,245	No	Yes

No further sales have been added in the current monitoring period.

Accordingly, the verification team together has verified 22 samples collectively (11 samples for each technology distributed under this VPA) during the on - site survey and observed that the sampling survey results of the PP for all the CEPs checked were consistent with VVB's survey results. The sampling method used is in line with Standard: Sampling and surveys for CDM project activities and programme of activities /23/ and Guideline: Sampling and surveys for CDM project activities and programme of activities /24/. In all, the verification team conducted onsite surveys for 22 households.

D.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Area of verification findings	No. of CL	No. of CAR	No. of FAR
General	-	-	-
Compliance of the monitoring report with the GS4GG monitoring report form	-		-
Remaining forward action requests from validation and/or previous verifications	-	-	-
VPAs considered for verification and covered under this report	-	-	-
Programme of activities	-	-	-
Compliance of the programme implementation with the registered PoA-DD	-	-	-

Implementation and operation of the management system	-	-	-
VPA Implementation	-	-	-
Compliance of the VPA implementation with the included VPA design document	-	-	-
Post-design certification changes	-	-	-
Compliance of the monitoring activities with the registered monitoring plan	-	-	-
Data and parameters fixed ex ante or at renewal of crediting period	-	-	-
Data and parameters monitored	-	-	-
Comparison of monitored parameters with last monitoring period	-	-	-
Implementation of the sampling plan	-	-	-
Assessment of data and calculations of net emission reductions or removals	-	-	-
Calculations of baseline value of each SDG Impact	-	-	-
Calculations of project value of each SDG Impact	-	-	-
Calculations of leakage GHG emissions	-	-	-
Calculations of net benefits for each SDG Impact	-	-	-
Comparison of actual GHG ER value achieved during this monitoring period with estimated value	-	-	-
Safeguarding principles	-	-	-
Stakeholder Inputs and Legal Disputes	-	-	-
Continuous input and grievance mechanism	-	-	-
Internal quality control	-	-	-
Others (editorial/ consistency)	-	-	-
Total	00	00	00

SECTION E. Verification findings

E.1. Compliance of the monitoring report with the GS4GG monitoring report form

Means of verification	The monitoring report form used is GS4GG Monitoring report template version 1.1 /04/, which is a valid version available at the time of verification. All the sections of the aforesaid form were filled as per the Monitoring report template guide version 1.1 /04/ and all the relevant details were provided in the form.
Findings	No findings were raised.
Conclusion	The monitoring report version 1.0/40/ has been found to be completed using the valid version of the monitoring report form. The information provided in the monitoring report has been assessed in accordance with the GS4GG principles & requirements version 1.2/25/ and monitoring report template guide /04/.

Remaining forward action requests from validation and/or previous verifications

This is the second verification of VPA 5 under GS. The validation and verification of the VPA were submitted simultaneously for GS design and performance review, and no FAR's were raised during the last verification.

E.2. VPAs considered for verification and covered under this report

Title and GS reference number of the VPA included in the PoA as of the end of this monitoring period	Is the VPA considered for this verification? (yes/no)	Version of the VPA-DD/ PoA-DD
GS11450 - MicroEnergy Credits –	Yes	Version 5.0

Microfinance for Clean Energy Product Lines – India - CPA 05 - GS11504		

E.3. Programme of Activities

E.3.1. Compliance of the programme implementation with the registered PoA-DD

Means of verification	The PoA involves the promotion, distribution and sale of improved cook stoves (ICS), Solar lighting systems and water purifiers in India. CME has implemented the VPA's through coordination with the partner organizations (POs) and further with local/channel sellers/distributors. The overall responsibility of implementation and operation is with CME (MEC), which was evident from the interviews conducted with CME. This is consistent with PoA DD /01/. The current verification considers VPA 05 - GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - CPA 05 - GS11504) that was put together by CME. This VPA has implemented WPS and SLS technology. No ICS were distributed under these VPA, which has been confirmed through the sales database. The implementation of the VPA, as referenced above, is within the geographical boundary of the PoA-DD/01/, which constitutes the physical boundary as well. The type of CEP (Clean Energy Product) models deployed under the VPA is verified by the following: **VPA 05 – GS11504:** Solar lighting systems implemented under the PoA are renewable energy-based LED/CFL lighting systems. Through the introduction of LED/CFL-based lighting systems the project activity is replacing portable fossil fuel-based lamps. Water purification system disseminated under the PoA include various models. The water purifiers remove harmful virus, bacteria, parasites, pesticides and physical impurities, giving the water which is as safe as boiled water. The water purification systems disseminated in this PoA do not require electricity or continuous tap water and hence, there is no plumbing required. The Improved Cook stove model implemented under the PoA include Grameen Greenway Smart Stove (GSSV3) and Grameen Greenway Jumbo Stove (GJS), among other models. These ICS are high efficiency cook stoves designed as an eco-friendly and modern replacement for traditional mud & stone stoves and delivers convenient cooking without

Type of CEP	Model	PO/ Implementer
Water Purification System	PureIt Classic (HUL-PureIt)	Evangelical Social Action Forum (ESAF)
Solar Lighting System	There are various models of Solar lighting systems distributed in VPA 05, which were all reviewed and found acceptable under the applied methodology	Shri Kshetra Dharmasthala Rural Development Project (SKDRDP) Muthoot Microfin Ltd. Bandhan Creations Pvt. Ltd. (Bandhan)

any requirement of fuel processing or change in cooking habits thus solving the health, environment and fuel collection effort required for operating traditional stoves. **However, it is to be noted that no improved cookstoves are disseminated under verified VPAs.**

Technical specification of each type of CEP models are verified with the details provided by respective CEP suppliers and found to be consistently reported in the monitoring report.

As per the PoA DD/1/ maximum 2 types of CEPs shall be deployed under any VPA in any combination except ICS and Water Purifier being together. The numbers of CEPs deployed under the VPA has been confirmed by the monitoring database i.e., Credit Tracker Platform /43/.

The verification team has confirmed that the number of CEPs deployed under the VPA and the actual emission reduction/year (for type III) for both SLS and WPS were found as follows:

VPA title and GS ID	Technology	Savings/Capacity/Emission Reduction
GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - CPA 05 - GS11504	WPS	Year 1 2020: 14,319 Year 2 2021: 27,054 Year 3 2022: 25,395
	Solar Lightning System	Year 1 2020: 3,150 Year 2 2021: 5,789 Year 3 2022: 5,183

The verification team was able to confirm that the quantity, specification, and target group of the CEPs is consistent with the PoA DD /1/ and VPA DDs/2/. Further, based on the review of Credit Tracker Platform /43/, physical observations from on-site visit conducted during current monitoring period:

- The VPA(s) are implemented within the boundary of the PoA as described in the PoA-DD/1/.
- The PP is same as that mentioned in the PoA-DD/1/.
- The implementation and operation of the project activity has been conducted in accordance with the description contained in the PoA-DD/1/ and VPA-DDs/2/.
- All physical features of the VPA proposed in the included VPA-DDs are in place.
- The project participants/VPA implementer has operated the VPAs as per the included VPA-DDs.

The verification team has conducted surveys via on-site visits with 22 households. It was observed that each CEP was assigned a unique household identification number. The unique identification number on each CEP, personal information of CEP owners and commissioning date of CEP was cross checked with the MIS system of POs and further checked with Credit Tracker Platform available with the PP. The operation of the CEPs was confirmed through remote surveys of owners/representatives (of CEPs). The households were asked various questions to confirm identity of the end user, operational status of the CEPs, presence and usage of baseline technologies, among others.

The emission reductions being claimed during this monitoring period are lesser than the estimated emission reductions in the VPA-DDs, as given in the table below for comparable estimated ERs in the VPA-DDs for the corresponding period:

	<table><tr><th>As in CPA-DD</th><th colspan="2">Estimated ERs (tCO_2)</th><th colspan="2">Actual ERs (tCO_2)</th></tr><tr><td rowspan="2">GS11450 - MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India - CPA 05 - GS11504,</td><td>WPS</td><td>SLS</td><td>WPS</td><td>SLS</td></tr><tr><td>Year 1: 17,227 Year 2: 33,445 Year 3: 33,445</td><td>Year 1: 6,409 Year 2: 12,443 Year 3: 12,443</td><td>Year 1: 14,319 Year 2: 27,054 Year 3: 25,395</td><td>Year 1: 3,150 Year 2: 5,789 Year 3: 5,183</td></tr></table> The verification team considers the programme description as contained in the PoA-DD/1/ is complete and accurate. The PoA-DD/1/ complies with the applied methodologies, tools, and forms. The monitoring report was compared and verified against the description provided in the PoA-DD/1/ and found to be correct. **Grievance Mechanism** The grievance mechanism involves recording the complaints from the beneficiaries by the field staffs to the household on a regular basis in a logbook/36/ which is maintained at the registered office. During the current monitoring period, no grievances were received which was verified upon checking the logbook/36/.
Findings	
Conclusion	The verification team can confirm that all physical features (technology, project equipment, and monitoring and metering equipment) of the VPAs were in place and that the PP operated the project activity in accordance with the registered VPA-DDs/2/ and VPA-Inclusion Report/3/ during the current monitoring period and based on the information verified through the on-site audit and interviews.

E.3.2. Implementation and operation of the management system

Means of verification	Based on the interview of CME representatives, representatives of different POs (VPA implementer's) and monitoring team, it is confirmed that the CME has organized an appropriate management and operational system for monitoring and reporting. The CME co-ordinates with respective POs to establish a marketing and lending program for CEPs. POs staff, local distributors, technicians, and other service providers involved in marketing of CEPs to concerned households. The monitoring plan and procedures to identify each CEP sold have been followed by POs. MEC (Micro Energy Credits Corporation Private Limited) is CME for the PoA and responsible for inclusion of VPAs in the PoA. The Carbon Operation Manager of MEC is responsible for completion of the inclusion process. The Carbon Operation Manager directly reports to CEO of CME and gets the carbon expert assistance during the VPA inclusion process, if required. The information about the type of CEP installed under each VPA is stored

	in Credit Tracker Platform/43/ that is maintained by MEC (CME). The Credit Tracker Platform/43/ records the unique identification number, location, installation date, and usage status of each clean energy product (CEP) in each VPA, helps to identify, locate and verify any or all of the CEP installations in particular VPA. CME has provided the tracker output file/46/ that is used to ensure that unique identification of CEPs can be tracked. This file has been verified to also ensure that no household receives more than 1 solar lighting system. The Carbon Operation Manager at the CME is responsible for QA/QC of the data, analysis, and reporting into the monitoring report. For survey data, a monitoring team has been organized by the CME consisting of trained monitoring staff, who conducted the surveys/ field tests. The staff was interviewed, and training records/32/ were checked to ensure that they were trained for conducting the surveys/ field tests. The monitoring manager at the CME is responsible for QA/QC of the data, analysis, and reporting into the monitoring report. In line with the registered monitoring plan, CME conducts an annual survey to ascertain the status of equipment and classify them as installed active, installed damaged and installed inactive. This process is to initiate a repair/post-sales service. All the products which were found to be damaged or inactive are discounted from emission reduction calculation as verified from emission reduction spreadsheet/5/6/. There are no CEPs with installed inactive status in the database for the VPA included in batch requesting issuance. VPA Implementer/PO field staff annually visit households included in the database to cross-check the information on the database with the factual evidence in the field. Any inconsistencies found (e.g., change in the address of a user) are updated on the database, and in the case, CEPs are found to be no longer in use, they will be clearly marked as such and excluded from emission reduction calculations. Original copies of sales receipts/13/, completed survey forms/39/ and carbon title transfer forms/12/ are retained by the respective POs/VPA implementers. The organizational structure and roles and responsibilities for monitoring were in line with the information provided in the VPA-DDs/02/, which was confirmed through interviewing PD representatives and the situation on the ground as observed during the onsite visit conducted during current monitoring period, and the structure was considered appropriate. The CEP users sign a title transfer/12/ with the PO while purchasing the product. The title transfer affirms the legal rights of the carbon credits generated by the CEP to the POs. The verification team cross-checked that that carbon title forms/12/ were duly signed by the end-users. Further, a signed contractual agreement between the PO and the CME/37/ guides the transfer of the emission reduction rights to the PP. It has been checked and verified from sample carbon title transfer forms/12/ and agreement between POs and CME/37/ that for the VPA's covered in current verification, the carbon credits generated from the VPA belong to the POs and are later transferred to the CME (MEC). The verification team confirms that the process pertaining to the transfer of emission reduction rights to CME is valid and appropriate for all VPAs under this batch which are requesting issuance.
Findings	No finding was raised.
Conclusion	The verification team assessed the management systems in place to

	implement the monitoring of the PoA. This included the roles and responsibilities, data collection, transfer and aggregation procedures, data storage and archiving for the monitoring system. The roles and responsibilities data collection transfer and aggregation procedures, data storage and archiving for the monitoring system have been provided in the MR /40/. The verification team confirms that the monitoring management system of the VPA and by extension PoA is in place with the responsibilities properly identified and established as per the PoA-DD/01/.

E.3.3. Post-design certification changes

E.3.3.1. Temporary deviations from the approved Monitoring & Reporting Plan, methodology or standardized baseline

Not Applicable

E.3.3.2. Corrections

Not Applicable

E.3.3.3. Inclusion of a monitoring plan

Not Applicable

E.3.3.4. Permanent changes from the Design Certified monitoring plan, applied methodology or applied standardized baseline

Not Applicable

E.3.3.5. Changes to the programme design

Not Applicable

E.3.3.6. Addition of CPA inclusion template

Not Applicable

E.3.3.7. Change of coordination/managing entity

Not Applicable

E.3.3.8. Change specific to afforestation and reforestation activities

Not Applicable

E.4. Voluntary project activity

E.4.1. Compliance of the VPA implementation with the included VPA design document

Means of verification	**This section includes the implementation of WPS:** The reporting for this issuance has been done technology-wise, thus section E.5 shall be dealing with distribution of WPS and its compliance with PoA-DD/01/ and applicable standard. VPAs described in this section target the promotion, distribution and sale of WPS (Water Purification System) i.e., PureIt Classic (HUL-PureIt). Their specifications have been checked against the manufacturer specifications/38/ Micro Energy Credits Corporation Private Limited is the Coordinating and

Managing Entity (CME) for the implementation of VPA's. The CME coordinates and manages each Partner Organization (PO)/ VPA Implementer and assists them in implementing each element of the monitoring plan, which was confirmed to be the case by interviewing the CME and PO staff.

Water Purification System:

VPA Ref. #	GS 11504 (VPA 05)
Location / State	Kerala (KL)
CEP Type	WPS
CEP Model	PureIt Classic (HUL-PureIt)
VPA Implementer / PO	ESAF
Total Quantity Sold / Disseminated	23,425
Maximum Estimated Qty CEPs in CPA (for comparable year of distribution)	23,425
Estimated ERs (comparable period) (tCO2e)	84,117
Actual ERs from the CEP Type (tCO2e)	56,716

VPA 05 – GS11504:

WPS were distributed in Kerela (KL) in India, which is consistent with the description given in the included VPA-DD/2/. By the end of the current monitoring period requesting issuance, a total of 23,425 WPS were disseminated under this VPAs, which is within the estimated quantity of 23,425 WPS of the VPA-DD/2/ for comparable year of distribution. It's a small scale VPA. The distributed model is that WPS are distributed by PO, managed by CME. The WPS are sold to end users and the sales data is collected by means of sales receipts/22/ at the end of sale to the end-user.

PO has a mechanism of allocating a unique ID to each CEP and the end user so that there is no inter and/or intra-VPA double counting. It was found that PO involved in implementation of VPA's are involved in this issuance has allocated unique identification numbers to the CEPs sold by them. This information was checked against sample end-user documentation, PP database, and was found to be appropriate. The WPS are sold to end users and the sales data is collected by means of sales receipts/13/ at the time of sale to the end user.

This verification report covers the monitoring period from 27/06/2020 to 31/12/2022 (inclusive of both the dates).

Findings	No findings were raised.
Conclusion	• The verification team is of the opinion that physical features of the VPA have been implemented in accordance with the VPA-DDs/02/. • It is also confirmed, through the review of the supporting documentation, that physical features of the component VPA have been implemented in accordance with the VPA-DDs /02/. • The VPA's was also found to be completely operational in line with the VPA-DDs /02/. • The information provided in the relevant sections of the monitoring report are appropriately describe the implementation and operational status of the PoA.

E.4.2. Post-design Certification Changes

E.4.2.1. Temporary deviations from the approved Monitoring & Reporting Plan, methodology or standardized baseline

Not Applicable

E.4.2.2. Corrections

Not Applicable

E.4.2.3. Changes to the start – date of the crediting period.

Not Applicable

E.4.2.4. Change to project design of approved project

Not Applicable

E.4.3. Compliance of the registered monitoring plan with applied methodologies and standardized baselines

Means of verification	The monitoring plan contained in the VPA-DD/02/ was reviewed in relation to the monitoring requirements of the applied methodology, Emission reduction from safe drinking water supply-version 1.0 /09/, as well as the PoA DD /01/, bearing in mind the technology involved. In light of the review conducted, it was found that the monitoring plan in the VPA-DD/02/ contains all the required parameters to be monitored in the context of the VPA design and description and allows determination of emission reductions according to the PoA DD/01/ and applied methodology/09/. That is included in the VPA-DDs/02/.
Findings	No findings raised.
Conclusion	The monitoring plan is in line with the approved methodology Emission reduction from safe drinking water supply-version 1.0/09/, that is included in the registered PoA DD/1/ and VPA-DD/02/. The monitoring plan is in accordance with the applied methodology /09/ that is included in the VPA-DD/02/.

E.4.4. Compliance of monitoring activities with the registered monitoring plan

E.4.4.1. Data and parameters fixed ex ante or at renewal of crediting period

SDG13: SDWS 2; Project Technology Description

Means of verification	Parameter ID: SDWS 2; Project Technology Description The description of this parameter considered is mentioned as per VPA-DDs. The details were cross checked with the manufacturer's specification. The WPS models distributed in VPA 05 and their technical specifications are mentioned in the table below: Product Model: HUL Pureit Classic; Dimensions: 61 cm" x 29 cm" x 21 cm; Average unit weight, kg: 4.1 Kg; Cartridge Capacity to filter/ Lifetime, Liters: 1500 L All the distributed models under VPA 05 meet international criteria defined for microbiologically safe drinking water as defined by the Environmental Protection Agency (EPA), US and National Standards/48/.
Findings	No findings were raised.
Conclusion	The parameter is consistent with the registered VPA-DDs wherein it is recommended to establish baseline fuel usage for VPAs at the time of verification/02/. Hence the applied parameter is correct and justified.

SDG13: SDWS 4; Regulatory Framework for safe water supply

Means of verification	Parameter ID: SDWS 4; Regulatory Framework for safe water supply. The data has been confirmed from the respective VPA-DDs/02/ and crosschecked with the National Water Policy (2012) and the Jal Jeevan Mission (2019-2024)/48/ provided by the CME. The VPAs meet host country's potable water specifications set by BIS standards; the project is found in conformance and not conflicting with national regulatory frameworks and policies.
Findings	No findings were raised.
Conclusion	The value mentioned in the Monitoring Report /40/ and Emission Reduction Spreadsheet /05/06/ are consistent with the registered VPA-DDs/02/. The applied value is correct and justified.

SDG13: SDWS 5; Water sources in the project boundary

Means of verification	The data provided is verified from the respective VPA-DDs and cross checked with the applied methodology/09/.
Findings	No findings were raised.
Conclusion	The value mentioned in the Monitoring Report /40/ and Emission Reduction Spreadsheet /05//06/ are consistent with the registered VPA-DD/2/. The applied value is correct and justified.

SDG13: SWDS 6; Stove technologies used in the project boundary

Means of verification	The value of the parameter was confirmed and checked against the baseline survey and studies carried by various institutions at the time of validation. The values of the parameter are mentioned in the table below:

VPA	State	Three-stone fired	Gas Stove
VPA05	Kerala	10%	57%

Findings	No findings were raised
Conclusion	The value mentioned in the Monitoring Report /40/ and Emission Reduction Spreadsheet /05/06/ are consistent with the registered VPA-DDs/2/. The applied value is correct and justified.

SDG13: SDWS 7; Expected technical life of project activity; volume of years

Means of verification	The value applied for the parameter is verified from the VPA-DD/02/ and cross checked with Manufacturer's specification of the project technology/38/. The operation lifetime of the device filter/ cartridge in terms of litres is 1500L (HUL Pureit). Same values were reflected in the Monitoring Report dated 21/09/2023 version 02. The values have been cross checked with the manufacturers' specification/38/ and lifespan of the devices is mentioned in terms of capacity of the Germ Kill Kit.
Findings	No finding was raised.
Conclusion	The value mentioned in the Monitoring Report /40/ and Emission Reduction Spreadsheet /05/06/ are consistent with the registered VPA-DD/2/. The applied value is correct and justified.

SDG13: SDWS 8; Percentage of fuel f used in target population; x_f

Means of verification	The value applied for the parameter is verified from the VPA-DD/02/ and cross checked against the baseline survey and studies carried by various institutions at the time of validation. The value of this parameter considered is mentioned below as per VPA-DD: VPA: VPA05 | State: Kerala | Fuelwood: 92% | LPG: 8% The raw data from baseline study and baseline survey results was crossed-checked and was found to be consistently reported in the monitoring report.
Findings	No findings were raised.
Conclusion	The value mentioned in the Monitoring Report /40/ and Emission Reduction Spreadsheet /05/06/ are consistent with the registered VPA-DDs/2/. The applied value is correct and justified.

SDG13: SDWS 9; $EF_{b,f,CO2}$, CO2 emission factor arising from use of fuels in baseline Scenario; tCO_2/TJ

Means of verification	The value applied for the parameter was found to be the default IPCC value sourced from 2006 IPCC Guidelines for National Greenhouse Gas Inventories 2.1, Volume 2: Energy at the time of validation. The values are confirmed from the VPA-DD/02/. This value is used for the determination of baseline emissions. The value of this parameter considered as mentioned in the VPA-DDs is 112 tCO_2/TJ for Firewood and 63.1 tCO_2/TJ for LPG. The value was also cross checked with applied methodology Emission Reductions from Safe Drinking Water Supply" v1/09/.
Findings	No findings were raised.
Conclusion	The value mentioned in the Monitoring Report /40/ and Emission Reduction Spreadsheet /05/ are consistent with the registered VPA-DDs/2/. The applied value is correct and justified.

SDG13: SDWS 10; $EF_{b,f,non-CO2}$, Non-CO2 emission factor from use of fuels, in case the baseline fuel is biomass or charcoal; tCO_{2e}/TJ

Means of verification	The value applied for the parameter was found to be consistent with the respective VPA-DDs/02/ and cross checked with the the default IPCC value sourced from 2006 IPCC Guidelines for National Greenhouse Gas Inventories 2.1, Volume 2: Energy/30/. The value of this parameter considered as mentioned in the VPA-DDs is 9.46 tCO_2e/TJ for wood. The value was also cross checked with applied methodology Emission Reductions from Safe Drinking Water Supply" v1/09/.
Findings	No findings were raised.
Conclusion	The value mentioned in the Monitoring Report /40/ and Emission Reduction Spreadsheet /05//06/ are consistent with the registered VPA-

	DDs/2/. The applied value is correct and justified.

SDG13: SDWS 11; ηwb, 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; %

Means of verification	The values were verified through VPA DDs and are correctly reported in the monitoring report. The value of this parameter considered as mentioned in the VPA-DDs is 10% for three stone fired stove and 57% for gas stove. The value was also cross checked with applied methodology Emission Reductions from Safe Drinking Water Supply" v1/09/.
Findings	No findings were raised.
Conclusion	The value mentioned in the Monitoring Report /40/ and Emission Reduction Spreadsheet /5//6/ are consistent with the registered VPA-DDs/2/. The applied value is correct and justified.

SDG13: SDWS 12; C_b, 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; %

Means of verification	The value mentioned in the parameter is found to be consistent with the values mentioned in respective VPA-DDs/02/. The value of the parameter is based on baseline survey carried out by PP and verified at the time of validation. This value is used for the determination of baseline emissions. The value of this parameter considered as mentioned in the VPA-DDs are as follows:

VPA	State	C_b
VPA05	Kerala	5.30%

Findings	No findings were raised.
Conclusion	The value mentioned in the Monitoring Report /40/ and Emission Reduction Spreadsheet /5//6/ are consistent with the registered VPA-DDs/2/. The applied value is correct and justified.

SDG13: SDWS 13; q_i, Capacity of the household or institutional water treatment technology; Litres per hour

Means of verification	The values were verified from the VPA-DD/02/ and cross-checked with the manufacturer specification of the technology/38/. This value is used for the determination of baseline emissions. The value of this parameter considered as mentioned in the VPA-DD are as follows: HUL pureit – 9 L/h
Findings	No findings were raised.
Conclusion	The value mentioned in the Monitoring Report /40/ and Emission Reduction Spreadsheet /5//6/ are consistent with the registered VPA-DD/2/. The applied value is correct and justified.

SDG13: SDWS 21; $f_{NRB,b,I,y}$, Fractional non-renewability status of woody biomass fuel during year y, in case the baseline fuel is biomass

Means of verification	The values mentioned in the parameter are consistent with the values mentioned in the VPA-DD/02/ and cross-checked with CDM Methodological tool 30: Calculation of the fraction of non-renewable biomass, Version 03.0/45/ and is found to be correctly reported in the monitoring report. The values considered in this parameter is: Kerala-0.987
Findings	No findings were raised.
Conclusion	The value mentioned in the Monitoring Report /40/ and Emission Reduction Spreadsheet /5//6/ are consistent with the registered VPA-DD/2/. The applied value is correct and justified.

E.4.4.2. Data and parameters monitored (Carbon & SDG)

SDG13: SDWS 18; Fraction; $M_{q,y}$

<table>
<tr><td>Relevant SDG Indicator</td><td colspan="2">SDG13: Climate Action</td></tr>
<tr><td>Means of verification</td><td>Criteria/Requirements</td><td>Assessment/Observation</td></tr>
<tr><td></td><td>Measuring /Reading /Recording frequency</td><td>The parameter is measured and recorded annually.</td></tr>
<tr><td></td><td>Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)</td><td>Yes. The frequency is in line with the PoA-DD/1/ and VPA-DDs/2/</td></tr>
<tr><td></td><td>Monitoring equipment</td><td>Not Applicable</td></tr>
<tr><td></td><td>Calibration frequency /interval:</td><td>NA</td></tr>
<tr><td></td><td>How were the values in the monitoring report verified?</td><td>The value of this parameter is derived based on water quality tests conducted by various NABL accredited laboratories/49/.
For the monitoring period, the value of the parameter is 1.
The values obtained for this parameter are:
<table>
<tr><th>VPA</th><th>Partner</th><th>State</th><th>Model</th><th>M_q</th></tr>
<tr><td>VPA 5</td><td>ESAF</td><td>Kerala</td><td>HUL Pureit</td><td>1</td></tr>
</table>
For all devices non-operational during monitoring, value of parameter “$M_{q,y}$” is also “0”, since no water quality test can be</td></tr>
</table>

		conducted. If there are cases where the device was functional during monitoring survey but had status 'installed_damaged' as per annual usage survey, the $M_{q,y}$ parameter is still considered '0' conservatively i.e. that WPS is not considered in compliance with water quality requirements of the methodology, irrespective of the actual water quality test result of these devices. This has been checked from in ER sheet/5//6/ and the approach is found to be conservative, thus acceptable
	If applicable, has the reported data been cross-checked with other available data?	The data has been cross-checked with the onsite visit carried out by the VVB/47/ where the end-users were asked whether they found the water from the CEP safe or not and was there any difference observed. The end users responded positively and reported that water quality was believed to be safe and visibly cleaner from the previous source. Furthermore, sample water quality test reports/51/ have been verified by the VVB for VPA 5 (Kerala) during the Site visit.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. The QA/QC procedure are in place, internal checks have been done by the VPA implementer and established through on-site interviews.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable
Findings	No findings were raised.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/2/ (as per measurement methods and procedures to be applied) and applied methodology/9/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.	

SDG13: Water hygiene education campaigns

Relevant SDG Indicator	SDG13: Climate Action	
Means of verification	**Criteria/Requirements**	**Assessment/Observation**
	Measuring /Reading /Recording frequency	Annually

	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the PoA-DD/1/ and VPA-DDs/2/.
	Monitoring equipment	Not applicable as this parameter is ascertained through campaigns
	Calibration frequency /interval:	Not Applicable
	How were the values in the monitoring report verified?	The value of this parameter is based on annual hygiene campaign records/07/ where 213, 233 and 233 households across Kerala state of India in VPA 05 were presented with a questionnaire-based survey for year 2020, 2021 and 2022. The resulting values were: Percentage of households with basic hygiene practices = 93%, 94% and 95% in VPA 05, Percentage of households with safely managed drinking water = 53.05%, 50.64% and 48.5% in VPA 05 as reported in the Monitoring Report/40/ provided by the CME. The survey results and records /39/were checked by the verification team and were found acceptable. The results are reproducible in the corresponding ER sheet of final Monitoring Report. The responses from randomly selected samples from VPAs for WPS under this batch issuance for VVB survey were cross-checked with PP monitoring survey forms which were provided by the CME, and all end users responses were consistent with monitoring results.
	If applicable, has the reported data been cross-checked with other available data?	Not Applicable.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. The QA/QC procedure are in place, internal checks have been done by the VPA implementer and established through on-site interviews.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable
Findings	No findings were raised.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/2/ (as per measurement methods and procedures to be applied) and applied methodology/9/. The monitoring results were recorded	

	consistently as per the approved frequency in the monitoring plan/2/.

SDG13: SDWS 22; Proportion of project end-users that boil safe (treated, or from safe supply) water after installation of project technology in year y; Percentage; $X_{Cleanboil,y}$

Relevant SDG Indicator	SDG13: Climate Action	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	Annually
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the PoA-DD/1/ and VPA-DDs/2/
	Monitoring equipment	Not Applicable
	Calibration frequency /interval:	Not Applicable
	How were the values in the monitoring report verified?	The value applied for this parameter is 0% and was verified against the onsite interview/47/, during which households were questioned if they continued practice of boiling water after installation of water purification system. All surveyed households confirmed that the water dispensed from project device is perceived safe for drinking and is not boiled or treated since installation of the project device.
	If applicable, has the reported data been cross-checked with other available data?	The values are cross-checked with sample survey records/39/ provided by the CME where the end-users confirmed that they did not boil water from the WPS as they considered it to be safe.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	The QA/QC processes were deemed to be appropriate and trustworthy.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable
Findings	No findings were raised.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/2/ (as per measurement methods and procedures to be applied) and applied methodology /9/. The monitoring results were recorded	

	consistently as per the approved frequency in the monitoring plan/2/.

SDG13: SDWS 24; Volume of drinking water per person per day for premises type p; Litres/person/day; QPW_p

Relevant SDG Indicator	SDG13: Climate Action	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	This parameter is measured annually.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the registered PoA-DD/1/ and VPA-DD/2/.
	Monitoring equipment	Volumetric Jar Least Count = 100 ml
	Calibration frequency /interval:	Not Applicable
	How were the values in the monitoring report verified?	The verification team randomly selected 11 samples for VVB's remote survey/47/ and via these surveys found out an approximate amount of water consumed per person per day, which was comparable with the CME's sample survey result /39/. The value of the parameter as per VPAs are:
	If applicable, has the reported data been cross-checked with other available data?	The survey results and assumptions were checked by the verification team and were found acceptable. The results are reproducible in the corresponding ER sheet of final Monitoring Report/40/.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. The QA/QC procedure are in place, internal checks have been done by the CPA implementer and established using information received during remote surveys and interviews. QA/QC procedures were also assessed during the MP and were found to be in place.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM	Not Applicable

VPA	Partner	State	QPW_p
VPA 5	ESAF	Kerala	4.01(Year-1)
			4.01(Year-2)
			3.89(Year-3)

	Project Standard?	
Findings	No findings were raised.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/2/ (as per measurement methods and procedures to be applied) and applied methodology /9/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.	

SDG13: SDWS 25; Number of individuals per premises type p in the project boundary in year y; H$N_{p,y}$

Relevant SDG Indicator	SDG13: Climate Action	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	Annually
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the registered PoA-DD/1/ and VPA-DD/2/
	Monitoring equipment	Not Applicable
	Calibration frequency /interval:	Not Applicable
	How were the values in the monitoring report verified?	The verified value in this monitoring period was assessed to be:
	If applicable, has the reported data been cross-checked with other available data?	These values were cross-checked with the Census records/14/ shared by the PP in line with the applied methodology/09/. PP has applied conservative values for the parameter and the lowest value amongst the project survey and census was considered for the emission reduction calculation.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	The QA/QC processes were deemed to be appropriate and trustworthy.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been	Not Applicable

VPA	Partner	State	Project Survey
VPA 5	ESAF	Kerala	4.20 (Year-1)
			4.20 (Year-2)
			4.20 (Year-3)

	approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	
Findings	No findings were raised.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/2/ (as per measurement methods and procedures to be applied) and applied methodology /9/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.	

SDG13: SDWS 28; Accumulated number of premises type p with at least one individual project technology in year y; Number; $N_{p,y}$

Relevant SDG Indicator	SDG 13: Climate Change	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	Annually
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the registered PoA-DD/1/ and VPA-DD/2/
	Monitoring equipment	Not Applicable
	Calibration frequency /interval:	Not Applicable
	How were the values in the monitoring report verified?	The verified value for this parameter are: VPA: VPA 5; Partner: ESAF; State: Kerala; Model: HUL Pureit; Sales: 23,425 (Year-1); 23,425 (Year-2); 23,425 (Year-3) The records of number of WPS distributed in monitoring database, ex-post ER sheets/05 were used for verification.
	If applicable, has the reported data been cross-checked with other available data?	The values were cross-checked with the sales database/13/ and Credit Tracker Records/43/ provided by the CME.

	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	The QA/QC processes were deemed to be appropriate and trustworthy.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable
Findings	No findings were raised.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/2/ (as per measurement methods and procedures to be applied) and applied methodology /9/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.	

SDG 13:SDWS 29, Usage rate of the project technology by premises type p during year y,%, $U_{p,y}$

Relevant SDG Indicator	SDG 13: Climate Change	
Means of verification	Criteria/Requirements	VVB Assessment
	Measuring /Reading /Recording frequency	Annually
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes, the frequency in line to the PoA-DD/1/ and VPA-DD/2/.
	How were the values in the monitoring report verified?	The data was verified during onsite visit/47/ conducted by the VVB where the end-users were asked about the operationality/functionality and usage of the CEP distributed. The end-users responded positively that the product was functional and was used daily. The end users were also questioned about the number of times they filled water in the WPS, to which the end users replied that during summers the number was greater than that of winters. The value of the parameter as per VPA is:

		<table><tr><th>VPA</th><th>Partner</th><th>State</th><th>Model</th><th>Value</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>58.91% (Year-1)</td></tr><tr><td>57.28% (Year-2)</td></tr><tr><td>53.86% (Year-3)</td></tr></table>
	If applicable, has the reported data been cross-checked with other available data?	The value was cross-checked with the survey carried out by CME/39/ and was found to be consistent.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	The QA/QC processes were deemed to be appropriate and trustworthy.
Findings	No findings was raised.	
Conclusion	Sustainability criteria was found to be fulfilled. The monitoring and reporting is as per the GS PoA-DD /1/, and registered VPA-DD/2/. The representation of the monitored value was found to be accurate which was easily verifiable. No discrepancy in data monitoring, data management, transfer of data or QA/QC procedures was found.	

SDG 13: SDWS 30, Usage time of the project technology by premises type p in year y,Hours per day, $t_{p,y}$

Relevant SDG Indicator	SDG 13: Climate Change	
Means of verification	Criteria/Requirements	VVB Assessment
	Measuring /Reading /Recording frequency	Annually
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes, the frequency is in line to the PoA-DD/1/ and VPA-DD/2/.
	How were the values in the monitoring report verified?	The value of the parameter is a default value taken from the applied methodology – Emission Reduction from Safe Drinking Water Supply version 1/09/, option 3. The value is taken to be 5 hours per day.
	If applicable, has the reported data been cross-checked with other available data?	Not Applicable
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes	The QA/QC processes were deemed to”be appropriate and trustworthy.

	in place?	
Findings	No findings were raised.	
Conclusion	Sustainability criteria was found to be fulfilled. The monitoring and reporting is as per the GS PoA-DD/1/ and VPA-DDs/2/. The representation of the monitored value was found to be accurate which was easily verifiable. No discrepancy in data monitoring, data management, transfer of data or QA/QC procedures was found.	

SDG 13: SDWS 31; Average days the project technology is present for end-users in the premises p in year y, Days, $DP_{p,y}$

<table>
<tr><td>Relevant SDG Indicator</td><td colspan="2">SDG13: Climate Change</td></tr>
<tr><td rowspan="5">Means of verification</td><td>Criteria/Requirements</td><td>VVB Assessment</td></tr>
<tr><td>Measuring /Reading /Recording frequency</td><td>Continuously</td></tr>
<tr><td>Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)</td><td>Yes, the frequency is in line to the PoA-DD/1/ and VPA-DD/2/.</td></tr>
<tr><td>How were the values in the monitoring report verified?</td><td>This was verified during the onsite visit/47/ conducted by the VVB where end users were questioned as to how long the product has been there at their household from the time of installation. The answer obtained by the end users was on an average 1 year. The values applied in the parameter are mentioned in the table below:
<table>
<tr><th>VPA</th><th>Partner</th><th>State</th><th>Model</th><th>Value</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>185 (Year-1)</td></tr>
<tr><td>359 (Year-2)</td></tr>
<tr><td>358 (Year-3)</td></tr>
</table></td></tr>
<tr><td>If applicable, has the reported data been cross-checked with other available data?</td><td>The value was cross checked with the survey records of the CME/39/ and was to be consistent.</td></tr>
<tr><td>Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?</td><td>The QA/QC processes were deemed to be appropriate and trustworthy.</td></tr>
<tr><td>Findings</td><td colspan="2">No findings were raised</td></tr>
</table>

Conclusion	Sustainability criteria was found to be fulfilled. The monitoring and reporting is as per the GS PoA-DD/1/, and registered VPA-DD/2/. The representation of the monitored value was found to be accurate which was easily verifiable. No discrepancy in data monitoring, data management, transfer of data or QA/QC procedures was found.

SDG 13: SDWS 32: Average number of individual project technologies in each project premises type p in year y, Number, $DN_{p,y}$

Relevant SDG Indicator	SDG 13: Climate Change	
Means of verification	Criteria/Requirements	VVB Assessment
	Measuring /Reading /Recording frequency	Annually
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes, the frequency is in line to the PoA-DD/1/ and VPA-DD/2/.
	How were the values in the monitoring report verified?	Based on the onsite visit/47/ conducted by the VVB where the end users were asked about the total number of the product received and sales database/13/ provided by the CME, this value was verified and accepted. The verified value was 1 i.e., each household received only 1 WPS during this verification period.
	If applicable, has the reported data been cross-checked with other available data?	Not Applicable
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	The QA/QC processes were deemed to be appropriate and trustworthy.
Findings	No findings were raised	
Conclusion	Sustainability criteria was found to be fulfilled. The monitoring and reporting is as per the GS PoA-DD/1/ and VPA-DD/2/. The representation of the monitored value was found to be accurate which was easily verifiable. No discrepancy in data monitoring, data management, transfer of data or QA/QC procedures was found.	

SDG1: Percentage of households having access to basic services (WPS distributed) in Project, $BSA_{Project}$, Percentage

Relevant SDG Indicator	SDG 1: No poverty	
Means of verification	Criteria/Requirements	Assessment/Observation

	Measuring /Reading /Recording frequency	This parameter is measured on annual basis
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the registered PoA-DD/1/ and VPA-DD/2/
	Monitoring equipment	Not Applicable
	Calibration frequency /interval:	Not Applicable
	How were the values in the monitoring report verified?	The verified value for this parameter as per VPAs are: **VPA** / **WPS** VPA05 / 53.61%(Year-1) 51.98% (Year-2) 48.56% (Year-3) The records of number of VPA for WPS distributed in monitoring database, ex-post monitoring survey records were cross checked. Since the database is a primary source of data collection and the QA/QC were found to be robust as described below, the values were accepted.
	If applicable, has the reported data been cross-checked with other available data?	Not Applicable
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	The QA/QC processes were deemed to be appropriate and trustworthy.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable
Findings	None	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology /08/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.	

SDG 6: Number of households served with safely managed water services

Relevant SDG	SDG 6: Clean Water and Sanitation

Indicator	
Means of verification	

Criteria/Requirements	Assessment/Observation
Measuring /Reading /Recording frequency	This parameter is measured on annual basis
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the registered PoA-DD/1/ and VPA-DD/2/.
Monitoring equipment	Not Applicable
Calibration frequency /interval:	Not Applicable
How were the values in the monitoring report verified?	The verified value for this parameter as per VPA are: **VPA** / **WPS** VPA05 / 13,068(Year-1) 12,707 (Year-2) 11,949 (Year-3) The ex-post monitoring records /7/18/ were checked to identify as a part of the assessment as well as during the interviews conducted with the 11 selected beneficiaries during the site visit. Since the usage survey determines the usage rate of WPS, the value of the parameter based in the usage survey was accepted.
If applicable, has the reported data been cross-checked with other available data?	Not Applicable
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	The QA/QC processes were deemed to be appropriate and trustworthy.
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable

Findings	None
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology /08/. The monitoring results were

	recorded consistently as per the approved frequency in the monitoring plan.

SDG 7: Access to affordable and clean energy (Number of operating WPS units under Project), $ACS_{Project}$, Number

<table>
<tr><td>Relevant SDG Indicator</td><td colspan="2">SDG7: Affordable and Clean Energy</td></tr>
<tr><td>Means of verification</td><td>Criteria/Requirements</td><td>VVB Assessment</td></tr>
<tr><td></td><td>Measuring /Reading /Recording frequency</td><td>Continuously</td></tr>
<tr><td></td><td>Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)</td><td>Yes, the frequency is in line to the PoA-DD/1/ and VPA-DD/2/.</td></tr>
<tr><td></td><td>How were the values in the monitoring report verified?</td><td>The post monitoring records were checked to identify as part of the assessment as well as during the interviews conducted with the 11 across the VPA selected beneficiaries during on site visit the intended beneficiaries who are having access to affordable, reliable and modern energy services.

The value of the parameter considered to be as mentioned below, which was found to be acceptable.
<table>
<tr><th>VPA</th><th>WPS</th><th>SLS</th></tr>
<tr><td rowspan="3">VPA 05</td><td>13,800(Year-1)</td><td>75,500(Year-1)</td></tr>
<tr><td>13,418(Year-2)</td><td>73,570 (Year-2)</td></tr>
<tr><td>12,618 (Year-3)</td><td>71,293 (Year-3)</td></tr>
</table></td></tr>
<tr><td></td><td>If applicable, has the reported data been cross-checked with other available data?</td><td>Not Applicable</td></tr>
<tr><td></td><td>Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?</td><td>The QA/QC processes were deemed to be appropriate and trustworthy.</td></tr>
<tr><td>Findings</td><td colspan="2">None</td></tr>
<tr><td>Conclusion</td><td colspan="2">Sustainability criteria was found to be fulfilled. The monitoring and reporting is as per the GS PoA-DD /1/ and registered VPA-DD/2/. The representation of the monitored value was found to be accurate which was easily verifiable. No discrepancy in data monitoring, data management, transfer of data or QA/QC procedures was found.</td></tr>
</table>

SDG 8: Quantitative Employment and income generation, QE $IG_{project}$, Number

<table>
<tr><td>Relevant SDG Indicator</td><td colspan="2">SDG 8: Decent Work and Economic Growth</td></tr>
<tr><td>Means of verification</td><td>Criteria/Requirements</td><td>VVB Assessment</td></tr>
<tr><td></td><td>Measuring /Reading /Recording frequency</td><td>Continuously</td></tr>
<tr><td></td><td>Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)</td><td>Yes, the frequency is in line to the PoA-DD/1/ and VPA-DD/2/.</td></tr>
<tr><td></td><td>How were the values in the monitoring report verified?</td><td>The employment contract /29/ were cross checked for all contracted employees /29/. Based on the documentary evidence provided by the CME, this value was verified and accepted.
The verified values are thus:
<table>
<tr><th>VPA</th><th>Net Value</th></tr>
<tr><td rowspan="3">VPA05</td><td>50(Year-1)</td></tr>
<tr><td>50 (Year-2)</td></tr>
<tr><td>50 (Year-3)</td></tr>
</table></td></tr>
<tr><td></td><td>If applicable, has the reported data been cross-checked with other available data?</td><td>Not Applicable</td></tr>
<tr><td></td><td>Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?</td><td>The QA/QC processes were deemed to be appropriate and trustworthy.</td></tr>
<tr><td>Findings</td><td colspan="2">None</td></tr>
<tr><td>Conclusion</td><td colspan="2">Sustainability criteria was found to be fulfilled. The monitoring and reporting is as per the GS PoA-DD /1/ and registered VPA-DD/2/. The representation of the monitored value was found to be accurate which was easily verifiable. No discrepancy in data monitoring, data management, transfer of data or QA/QC procedures was found.</td></tr>
</table>

E.4.5. Implementation of sampling plan

Means of verification	The sampling plan was implemented by the CME in accordance with the Gold Standard methodology Emission Reduction from safe drinking water supply v1.0/09/, and the CDM EB 110, Annex 1, Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities/23/. Since the VPA covers Kerala state and various model of WPS are distributed in the population, the sampling has been conducted for each state separately. Population with each state is reasonably considered homogenous. Therefore, the approach of simple random sampling for every sampling frame is acceptable. Parameters to be covered through monitoring surveys of sampled

households:
The project developer has conducted combined usage, project and hygiene survey during which 233 households in Kerelain VPA 05 have been surveyed in which WPS distributions occurred. From all these households, water quality tests were also conducted. Thus, following parameters are covered through monitoring surveys:

1. Mq,y
2. Xcleanboil,y
3. Up,y
4. Qpwp
5. HNp,y

Monitoring survey (by CME) duration:
The monitoring survey (field survey / tests) was carried out by PP representatives between the following duration for the current monitoring period.

For Monitoring Period: 27/06/2020 to 31/12/2022:

Survey Type	Monitoring Dates	Monitoring frequency	Monitoring survey applicable for this MP?
Usage /Project Survey	06/01/2021 to 1/02/2021 (year 1) 05/01/2022 to 15/02/2022 (year 2) 06/01/2023 to 15/02/2023 (year 3)	Annual	Yes
Water Testing	06/01/2021 to 1/02/2021 (year 1) 05/01/2022 to 15/02/2022 (year 2) 06/01/2023 to 15/02/2023 (year 3)	Annual	Yes

Sample size calculation for different tests

All monitored parameters were evaluated using simple random sampling with the requisite precision/confidence. The combined Usage/ Project and hygiene survey /42/ was done to determine usage and changes in circumstances experienced following the WPS project's deployment. The sample size was determined using the applied methodology guideline/08/. The representation of different age groups of distribution was also considered with 30 samples from each vintage picked in accordance with methodological sampling requirements. To ensure accurate representation of the entire population, the usage surveys were conducted on randomly chosen water purifiers dispersed across the project distribution boundary.

It is noted that the average lifetime of WPS model distributed in the VPAs, according to its technical specifications, is based on the Germ Kill Kit capacity. However, the lifetime may vary from individual product to

	product depending on usage handling and other physical factors. Parameter Usage Rate ensures that non-operationality rate of project devices found in representative sample is accounted for in ER calculations. All parameters of interest are included in the ER spreadsheet for the VPA. These were checked for the input values as well as formula applied and were found consistent. The reliability (demonstration of precision achieved after the survey results) is depicted in the ER calculation sheets corresponding to final Monitoring Report, which were also found correct.
Findings	No findings were raised.
Conclusion	The verification team confirmed that the sampling plan and the parameter values are in accordance with the monitoring plan provided in PoA DD/1/ and the VPA DD/2/.

E.4.6. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	No monitoring equipment required to monitor the parameters, as verified through the registered monitoring plan as outline in the VPA-DDs/2/ and PoA-DD/1/.
Findings	No findings were raised.
Conclusion	The verification team has determined that no monitoring equipment has been used by the PP. Therefore, there was no requirement of calibration. This was in accordance with the accepted monitoring plan and the applied monitoring methodology.

E.4.7. Assessment of data and calculation of emission reductions or net removals

E.4.7.1. Calculation of baseline value or estimation of baseline situation of each SDG Impact

Means of verification	**1-** SDG-13: Climate Action The equations used were found consistent with the PoA DD/1/, VPA DDs/2/ and the applied methodology Emission reduction from safe drinking water supply v1.0/9/ For calculation of emission reduction, the following formula has been used $ERy = BEy - PEy - LEy$ Where: ERy = Emission reductions in year y (Tco_2e/yr) BEy = Baseline emissions in year y (Tco_2e/yr) PEy = Project emissions in year y (Tco_2e/yr) LEy = Leakage emissions in year y (Tco_2e/yr) The baseline emission was 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

And

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

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

Also,

$SE_{w,b,y}$ = 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

ηwb = Efficiency of the stoves for baseline water boiling (%). Weighted average of baseline stove types.

Again,

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

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

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

Year 1	**12,300**

Year 2	**23,240**
Year 3	**21,176**

SDG 1: No Poverty (CP-2)

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

SDG 6: Clean Water and Sanitation (CP-2)

$HHTS_{Baseline}$ = Number of households served with safely managed water services = 0

SDG 7: Affordable and Clean Energy (CP-2)

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

SDG 8: Decent Work and Economic Growth (CP-2)

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

The calculation provided as a sample for one of the Partner-Model-State combination in MR/40/ has been reviewed and is found consistent with actual calculations applied in ER calculation sheet/5//6/ for that specific combination. It is noted that the sample calculation provided in MR is only one example of a specific group, which in no case reflects total baseline emissions from the technology i.e., from WPS distribution.
The calculations presented in the Monitoring Report /40/ and the corresponding ER sheet /05/06/ were found appropriate and complying with provisions prescribed in the registered monitoring plan/2/ of the respective VPA-DDs/2/, PoA-DD/1/ and applied methodology/8/.

Findings	No findings were raised
Conclusion	The verification team verified that a) A complete set of data for the monitoring period was available and the verification of each monitoring parameter is elaborated under Section E.5.4.2 of this report. The complete monitoring data is also presented in the corresponding ER calculations sheet/05//06/ of final Monitoring Report/40/. b) The information provided in the monitoring report was cross checked with other sources, wherever appropriate and available, and such information is also included under Section E.5.4.2 of this report. c) The calculations of baseline emissions as presented in the corresponding ER calculations sheet/5/6/ of final Monitoring Report/40/ were checked and found to be consistent with the formulae and methods described in the registered monitoring plan of VPA-DD/2/, registered PoA-DD/1/ and the applied methodology/08/. d) All assumptions used in the emission calculations were found appropriate and therefore justified. e) Appropriate emission factors, IPCC default factors/30/ and other reference values have been correctly applied. This has also been elaborated under Section E.5.4.1 of this report. f) No standardized baseline was prescribed in the registered PoA-DD/1/.

E.4.7.2. Calculation of project value or estimation of project situation of each SDG Impact

Means of verification	**SDG 13: Climate Action** For WPS, the project estimate is 0. This is because the devices are gravity based non-electric hence, no project emissions. **SDG 1: No Poverty** $BSA_{project}$ = Access to basic services (safe water) for VPA05 58.91% (Year 2020) 57.28% (Year 2021) 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** $ACS_{Project}$ Access to affordable and clean energy for VPA 05 (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 IGProject = 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)
Findings	No findings were raised
Conclusion	The verification team verified that a) A complete set of data for the monitoring period was available and the verification of each monitoring parameter is elaborated under Section E.5.4.2 of this report. The complete monitoring data is also presented in the corresponding ER calculations sheet/05//06/ of final Monitoring Report /40/. b) The information provided in the monitoring report was cross checked with other sources, wherever appropriate and available, and such information is also included under Section E.5.4.2 of this report.

E.4.7.3. Calculation of leakage

Means of verification	in case of WPS, the PoA-DD/1/, VPA-DD/2/ and applied monitoring methodology/08/ has applied a leakage factor of 5%, which is found

	appropriate. The onsite visit conducted, and project design also did not reveal any potential source to be considered in this regard.
Findings	No findings were raised.
Conclusion	A complete set of data for the monitoring period was available and the verification of each monitoring parameter is elaborated under Section E.5.4.2 of this report. The complete monitoring data is also presented in the corresponding ER calculations sheet/5//06/ of final Monitoring Report /40/. The Information provided in the monitoring report was cross checked with other sources, wherever appropriate and available, and such information is also included under Section E.5.4.2 of this report.

E.4.7.4. Calculation of net benefits or direct calculation for each SDG Impact

Means of verification

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

The calculation methods applied for all the SDG impacts were checked with PoA-DD/1/ and VPA-DDs/2/. The verification team confirms that the stated figures were checked and found acceptable.

Findings	No findings were raised.
Conclusion	The verification team confirms that: a) The complete data was available and is duly reported. b) As indicated above, the description with regard to cross-check of reported data is included under respective parameter (refer Section E.5.4 of this report); c) Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals, project emissions and leakage emissions were followed; d) Appropriate emission factors, IPCC default factors and other reference values were correctly applied.

E.5. Voluntary project activity

E.5.1. Compliance of the VPA implementation with the included VPA design document

Means of verification

This section includes the implementation of SLS

The reporting for this issuance has been done technology-wise, thus section E.6 shall be dealing with distribution of solar CEPs and its compliance with registered PoA-DD/1/, VPA-DD/2/ and applicable standard.
VPA 5 (GS11450) described in this section targets the promotion, distribution and sale of different models of solar lighting systems implemented in this PoA.
Micro Energy Credits Corporation Private Limited is the Coordinating and Managing Entity (CME) for the implementation of VPAs. The CME coordinates and manages each Partner Organization (PO)/VPA Implementer and assists them in implementing each element of the monitoring plan.

Solar Lighting systems (SLS):

VPA Ref. #	GS 11504 (VPA 05)
Location / State	Kerala Gujarat Tamil Nadu Karnataka Odisha Uttar Pradesh Maharashtra Madhya Pradesh Assam Bihar Jharkhand Tripura West Bengal
CEP Type	SLS
CEP Model	Multiple Models
VPA Implementer / PO	Multiple implementers
Total Quantity Sold / Disseminated	91,245
Maximum Estimated Qty CEPs in CPA ((for comparable year of distribution)	91,245
Estimated ERs (comparable period) (tCO2e)	31,295
Actual ERs from the CEP Type (tCO2e)	19,674

The solar lighting systems are sold to end users and the sales data is collected by means of sales receipts /13/ at the time of sale to the end user. The technical specifications of SLS model were verified through the specifications provided by technology suppliers /19/ and found to be consistent with the monitoring report. The PO has a mechanism of allocating a unique ID to each CEP and the end user so that there is no inter and/or intra-VPAs double counting. Total SLS distributed under VPA 5 are 91,245.

<table>
<tr><td></td><td>During onsite surveys, the end users were asked if we could see the product installed to confirm the model in use. It has been checked by the verification team that the verified VPAs are way below the threshold /5/ for their respective methodologies:
<table>
<tr><th>VPA</th><th>Capacity (MW)/ eRs (tCO2e)</th><th>Threshold (MW)/ (tCO2e)</th></tr>
<tr><td>GS11504 (VPA 05)</td><td>19,674 tCO_2e</td><td>60,000 tCO_2e</td></tr>
</table>
All technical specifications/19/ were reviewed and SLS models were found to be meeting the applied methodology requirements and PoA eligibility criteria of PoA and therefore, found acceptable by the verification team, as provisioned in section A.3 of VPA-DDs/2/.</td></tr>
<tr><td>Findings</td><td>No Findings were raised.</td></tr>
<tr><td>Conclusion</td><td>• The verification team is of the opinion that physical features of the VPAs have been implemented in accordance with the VPA-DDs/2/.
• It is also confirmed, through the review of the supporting documentation, that physical features of the component VPAs have been implemented in accordance with the VPA-DDs/2/.
• The VPAs was also found to be completely operational in line with the VPA-DDs/2/.
• The information provided in the relevant sections of the monitoring report are appropriately describe the implementation and operational status of the PoA.</td></tr>
</table>

E.5.2. Post-Design Certification changes

E.5.2.1. Temporary deviations from the approved Monitoring & Reporting Plan, methodology or standardized baseline

Not Applicable

E.5.2.2. Corrections

Not Applicable

E.5.2.3. Changes to the start-date of the crediting period

Not Applicable

E.5.2.4. Permanent changes from the Design Certified monitoring plan, applied methodology or applied standardized baseline

Not Applicable

E.5.2.5. Changes to project design of approved project

There are no changes made during this monitoring period.

E.5.3. Compliance of the registered monitoring plan with applied methodologies and standardized baselines

<table>
<tr><td>Means of verification</td><td>The monitoring plan contained in the VPA-DD/2/ was reviewed in relation to the monitoring requirements of the applied methodologies AMS III.AR version 7.0/8/ as well as the PoA DD/1/, bearing in mind the technology involved. In light of the review conducted, it was found that the monitoring plan in the VPA-DD/2/ contains all the required parameters to be monitored in the context of the VPAs design and description and allows determination of emission reductions according to the PoA DD/1/ and applied methodology/08/.
<table>
<tr><th>VPA-5</th><th>AMS III AR</th></tr>
<tr><td>Total Sales</td><td>91245</td></tr>
<tr><td>Monitoring Period Start Date</td><td>27-06-2020</td></tr>
<tr><td>Monitoring Period End Date</td><td>31-12-2022</td></tr>
<tr><td>Number of Days</td><td>918</td></tr>
<tr><td>Emission Reductions</td><td>19,674</td></tr>
</table></td></tr>
<tr><td>Findings</td><td>No findings were raised.</td></tr>
<tr><td>Conclusion</td><td>The monitoring plan is in line with the approved methodology, AMS III.AR Version 7.0/08/, that is included in the registered PoA DD/1/ and VPA-DD/2/. The monitoring plan is in accordance with the applied methodology /08/ that is included in the VPA-DD/2/.</td></tr>
</table>

E.5.4. Compliance of monitoring activities with the registered monitoring plan.

E.5.4.1. Data and parameters fixed ex ante or at renewal of crediting period

SDG13: The Lamp Emission factor, DV

Means of verification	The value of the parameter was sourced from default value prescribed in AMS-III.AR. (v.7)/8/. The value of this parameter considered is mentioned below as per VPA-DD. VPA Number: VPA 05 — Value: 0.092 Lumens/ W
Findings	No findings were raised.
Conclusion	The value mentioned in the Monitoring Report /40/ and Emission Reduction Spreadsheet/05/06/ are consistent with the approach given in VPA-DDs/2/. Hence the applied value is correct and justified.

E.5.4.2. Data and parameters monitored (Carbon & SDG)

SDG13: Number of project lamps distributed to end-users of type i with charging method j, $N_{i,j}$

Relevant SDG Indicator	SDG13: Climate Action	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	Annual
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the PoA-DD/1/ and VPA-DDs/2/
	Monitoring equipment	Not applicable
	Calibration frequency /interval:	Not applicable
	How were the values in the monitoring report verified?	The values reported in the final MR/40/ and ER sheet were verified through the output files of MEC credit tracker platform provided by the CME. During the current monitoring period, ERs from the total of devices distributed have been calculated. Each device, and lamps therein, are considered operational for the first three years of its crediting period after which monitoring is required, which is found to be in line with VPA-DD and applied methodology AMS-III.AR version 07. The verified value for the number of total

		solar lighting systems in this monitoring period is provided in table below: **VPA** | **Total lamps** VPA 5 | 1,35,249 It was noted that any point during the monitoring period, the small-scale threshold for Emission reduction was not exceeded by the VPAs. The verification team has verified the SLS models distributed in the current monitoring period and found those to be consistent with the technical specifications provided by respective product suppliers/19/ and the PoA-DD requirements/26/ During the on-site audit, end-users were surveyed to verify the models installed. The information thus obtained was cross-checked against technical specifications of the device and it was confirmed if it matched with those. Each household was found to be given a specific unique number. These unique identifiers are used to establish that double counting doesn't occur, and all devices are traceable to the households those were distributed to. The verification team checked the uniqueness of solar CEPs across the VPA from the database using Microsoft Excel based tools (eg. Conditional formatting to identify duplicate entries). All entries were found to be unique
	If applicable, has the reported data been cross-checked with other available data?	Yes. The information provided in the VPA credit tracker Database was verified randomly with the sales receipt and loan document. The data was found consistently recorded.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Solar light systems installation information was verified as maintained in the MEC tracker system that records the address of the households. It can be confirmed that management is ensuring the correct transfer of data and reporting of emission reductions and the necessary QA/QC processes are in place.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable
Findings	No findings were raised.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/2/ (as per measurement methods and procedures to be applied)	

	and applied methodology/08/.

SDG 13: Grid factor in year y (GFy), Fraction

Relevant SDG Indicator	SDG13: Climate Action		
Means of verification	Criteria/Requirements	Assessment/Observation	
	Measuring /Reading /Recording frequency	Not applicable (Default value used)	
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Not applicable (Default value used)	
	Monitoring equipment	Not applicable.	
	Calibration frequency /interval:	Not Applicable	
	How were the values in the monitoring report verified?	The values reported in the final MR were verified from the methodology AMS-III.AR. As per the applied methodology AMS-III.AR para 21, Grid Factor in year y is equal to 1.0 when charging option defined in paragraph 3(a) is used. Para 3(a) of methodology is applicable to the VPA i.e., the distributed project lamps are charged by a renewable energy system (photovoltaic system). It is also demonstrated at the time of VPA-inclusion and is cross checked during current verification from project database and on-site audit that the replaced lamps were kerosene lamps in line with para 8(a) of applied methodology and therefore it is assumed that all baseline emissions are from the consumption of fossil fuel (in this case, kerosene) for lighting. Therefore, for the current monitoring period default value 1.0 is considered for this parameter.	
	If applicable, has the reported data been cross-checked with other available data?	Not applicable	
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	It can be confirmed that management is ensuring the correct transfer of data and reporting of emission reductions and the necessary QA/QC processes are in place.	
Findings	No findings were raised		
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/2/ (as per measurement methods and		

	procedures to be applied) and applied methodology/08/.

SDG 13: Dynamic baseline factor in year y (DBy), Fraction

Relevant SDG Indicator	SDG13: Climate Action	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	Not applicable (Default value used)
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Not applicable (Default value used)
	Monitoring equipment	Not Applicable
	Calibration frequency /interval:	Not Applicable
	How were the values in the monitoring report verified?	The values reported in the final MR were verified through the methodology AMS-III.AR. According to applied methodology AMS-III.AR, under para 21 and parameter table 5, dynamic baseline factor can be calculated as "default of 1.0 in the absence of relevant information" This methodological choice is confirmed at the time of inclusion of VPA as the applicable approach to determine parameter DBy. Therefore, for the current monitoring period default value 1.0 is considered for this parameter.
	If applicable, has the reported data been cross-checked with other available data?	Not applicable
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	It can be confirmed that management is ensuring the correct transfer of data and reporting of emission reductions and the necessary QA/QC processes are in place.
Findings	No findings were raised	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/2/ (as per measurement methods and procedures to be applied) and applied methodology/08/.	

SDF 13: The percentage of project lamps distributed to end users that are operating and in service (OFy,i,j), Fraction

Relevant SDG Indicator	SDG13: Climate Action	
Means of verification	Criteria/Requirements	Assessment/Observation

	Measuring /Reading /Recording frequency	Default value for the first three years. Determined based on survey conducted in for years 4 – 7.	
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the registered PoA-DD/1/ and VPA-DD/2/	
	Monitoring equipment	Not Applicable	
	Calibration frequency /interval:	Not Applicable	
	How were the values in the monitoring report verified?	According to applied methodology, if option-2 (para 18) is applied, all project lamps are assumed to operate for first three years from installation, This is also cross-verified from applied methodology according to which, percentage of project lamps distributed to end users that are operating and in service are assumed to be equal to 100 per cent for years 1, 2 and 3. Therefore, since CME has chosen option-2 from AMS-III.AR para 18 in CPA-DD, the percentage of project lamps distributed to end users that are operating and in service is acceptable as 100% for lamps installed less than 3 years ago. However, in the case of the VPA under this verification, the monitoring has been conducted based on sampling for all years of distribution, i.e. ex-post monitoring has been conducted irrespective of the year of installation. Since the approach is more proactive than the minimum requirements of the applied methodology and will not lead to any overestimation of the emission reductions, the approach is found acceptable. The calculation for determining the sample size were checked by the verification team and found to be appropriate and consistent with monitoring plan, as well as with Standard: Sampling and surveys for CDM project activities and programme of activities v.9.0.	
	If applicable, has the reported data been cross-checked with other available data?	Not applicable	
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	It can be confirmed that management is ensuring the correct transfer of data and reporting of emission reductions and the necessary QA/QC processes are in place.	

Findings	None
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1//2/ (as per measurement methods and procedures to be applied) and applied methodology /08/.

Other SDGs

SDG 7: Access to affordable and clean energy (Number of operating SLS units under Project), $ACS_{Project}$, Number

Relevant SDG Indicator	SDG7: Affordable and Clean Energy	
Means of verification	Criteria/Requirements	VVB Assessment
	Measuring /Reading /Recording frequency	Continuously
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes, the frequency is in line to the PoA-DD/1/ and VPA-DD/2/.
	How were the values in the monitoring report verified?	The post monitoring records/40/ were checked to identify as part of the assessment as well as during the interviews conducted with the 11 across the VPA selected beneficiaries during on site visit the intended beneficiaries who are having access to affordable, reliable and modern energy services. The value of the parameter considered was found to be acceptable.
	If applicable, has the reported data been cross-checked with other available data?	Not Applicable
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	The QA/QC processes were deemed to be appropriate and trustworthy.
Findings	No findings were raised.	
Conclusion	Sustainability criteria was found to be fulfilled. The monitoring and reporting is as per the GS PoA-DD /1/ and registered VPA-DD/2/. The representation of the monitored value was found to be accurate which was easily verifiable. No discrepancy in data monitoring, data management, transfer of data or QA/QC procedures was found.	

VPA#	Value (Number)
VPA 05	75,505(Year-1)
	73,574 (Year-2)
	71,297 (Year-3)

E.5.5. Implementation of sampling plan

Means of verification	The monitoring has been carried out in accordance with the monitoring plan contained in the PoA-DD/1/ and respective VPA-DD/2/. **Sampling Design/Target Population/Sampling Frame/Reliability:** In this sampling design, the VPA that are covered under the current monitoring period GS11450 (VPA 05) are the subject. The sampling frame considered confidence level and precision as 90/10 considering the requirement of Standard for sampling and surveys for CDM pAs and PoAs/23/. The Credit Tracker Platform that records the contact details of the solar lighting systems end users, serves as the basis from which sampling frame is developed. **Sampling Method (AMS-III.AR):** The sampling is applied to the proportion-based parameter OFy,i,j for the monitoring period requesting issuance. The samples for monitoring are randomly picked from each sample set. The sampling frame considered confidence level and precision as 90/10 considering the requirement of Standard for sampling and surveys for CDM PoAs for the monitored parameter requiring sampling. The Credit Tracker Platform that records the contact details of all end users serve as the basis from which sampling frame is developed. Differently aged CEPs are divided into separate sample frames and samples are picked from each of these of these sets separately by applying the sampling plan on each of these batches. In conclusion, VVB reviewed all the evidence submitted by PP related to GHG emission reduction calculations and confirmed that all the parameters are correctly applied. Default values used in the calculation were identified correctly. The emission reduction calculation has been done in line with the applied methodology. **Sample selection:** The samples were randomly selected using a computerized randomizer tool in Microsoft excel, and the verification team has reviewed the calculation. The samples were drawn from the complete sales databases (irrespective of their usage status determined during usage survey) for each relevant VPA-DD/2/. The sample can be confirmed to be representative of the total population in the context of the consideration of vintage of implementation of solar CEPs. **Implementation of survey:** Based on interviews with the CME and surveyors during the onsite surveys, in addition to simply asking this question to the end users, the surveyors were also trained to visually inspect the solar lighting system to corroborate the responses received. Therefore, the implementation of survey was considered reliable. **Monitoring survey (by CME) duration:** The monitoring survey (field survey / tests) was carried out by CME representatives between following duration for the current monitoring period:

VPA Ref. No.	Technology	Survey dates for current monitoring period
GS 11504	SLS	28/06/2020 to 30/07/2020

			(year 1) 05/01/2021 to 15/02/2021 (year 2) 06/01/2022 to 15/02/2022 (year 3)

Therefore, it was concluded that the monitoring survey results obtained are applicable for the entire monitoring period.

Reliability and precision calculation:
The verification team has verified the ER calculation spreadsheets/05//06/ with the monitored data, where the actual achieved precision is calculated against the Guidelines outlined under "Standard for sampling and surveys for CDM project activities and programme of activities"/23/ and can confirm that the calculation of achieved reliability was done correctly.
Reliability and precision checks are carried out for each monitored sample group under the VPA. The parameters reported in ER spreadsheet were checked for the input values as well as formula applied and were found consistent. The reliability (demonstration of precision achieved after the survey results) is depicted in the ER calculation sheets /5//06/ corresponding to final Monitoring Report /40/, which were also found appropriate.
Based on the verified results the verification team found that the required precision is met in all the cases and therefore the survey results were directly used in the calculation of ERs.

Findings	No findings were raised.
Conclusion	The verification team confirmed that the sampling plan and the parameter values are in accordance with the monitoring plan provided in PoA DD/1/ and the VPA DDs/2/.

E.5.6. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	No monitoring equipment required to monitor the parameters, as verified through the registered monitoring plan as outline in the VPA-DDs/2/ and PoA-DD/1/.
Findings	No findings were raised.
Conclusion	The verification team has determined that no monitoring equipment has been used by the CME. Therefore, there was no requirement of calibration. This was in accordance with the accepted monitoring plan and the applied monitoring methodology.

E.5.7. Assessment of data and calculation of emission reductions or net removals

E.5.7.1. Calculation of baseline value or estimation of baseline situation of each SDG Impact

Means of verification	**SDG-13: Climate Action** The verification team verified that: a) A complete set of data for the monitoring period was available for the monitoring period and the verification of each monitoring parameter is elaborated under Section E.6.4 of this report. The complete monitoring data is also presented in the corresponding ER calculations sheets /5/ of final Monitoring Report /40/. b) The information provided in the monitoring report was cross checked with other sources, wherever appropriate and available, and such information is also included under Section E.6.4 of this report.

c) The calculations of baseline emissions as presented in the corresponding ER calculations sheet of final Monitoring Report were checked and found to be consistent with the formulae and methods described in the registered monitoring plan of each relevant VPA-DDs/2/, PoA-DD/1/ and the applied methodology/08/.
d) All assumptions used in the emission calculations were found appropriate and therefore justified
e) Appropriate emission factors, IPCC default factors/30/ and other reference values have been correctly applied. This has also been elaborated under Section E.6.4 of this report.
f) No standardized baseline was prescribed in the PoA-DD and therefore it has not been applied.
g) There is no pro-rata approach applied in the current monitoring period as entire monitoring period falls into period that is after the end of first commitment period of Kyoto Protocol.

The following equations were used to determine the baseline emissions as provided in the monitoring report /40/ and applied in the corresponding ER calculations sheets /05/. The equations used were found consistent with the revised accepted PoA-DD/1/, VPA-DDs/2/ and the applied methodology.

AMS-III.AR., Version 07/8/:

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

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

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:

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

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)

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

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

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** **SDG 7: Affordable and Clean Energy (CP-2)** $ACS_{Baseline}$ Access to affordable and clean energy (Number of operating WPS/SLS units under Baseline) = 0
Findings	No findings were raised.
Conclusion	The verification team verified that g) A complete set of data for the monitoring period was available and the verification of each monitoring parameter is elaborated under Section E.6.4.2 of this report. The complete monitoring data is also presented in the corresponding ER calculations sheet /5/ of final Monitoring Report /40/. h) The information provided in the monitoring report was cross checked with other sources, wherever appropriate and available, and such information is also included under Section E.6.4.2 of this report. i) The calculations of baseline emissions as presented in the corresponding ER calculations sheet /5/ of final Monitoring Report /40/ were checked and found to be consistent with the formulae and methods described in the registered monitoring plan of VPA-DDs /2/, registered PoA-DD /1/ and the applied methodology/08/. j) All assumptions used in the emission calculations were found appropriate and therefore justified. k) Appropriate emission factors, IPCC default factors/30/ and other reference values have been correctly applied. This has also been elaborated under Section E.6.4.1 of this report. l) No standardized baseline was prescribed in the registered PoA-DD/1/.

E.5.7.2. Calculation of project value or estimation of project situation of each SDG Impact

Means of verification	**SDG 13: Climate Action (CP-2)** The PoA-DD/1/, VPA-DDs/2/ and applied monitoring methodology/08/ does not prescribe any project emissions to be considered. The onsite visit conducted, and project design also did not reveal any potential source to be considered in this regard. **SDG 7: Affordable and Clean Energy (CP-2)** $ACS_{Project}$ = Access to affordable and clean energy for VPA 05 (Number of operating SLS units under Project). = 75,505 (Year 2020) = 73,574 (Year 2021) = 71,297 (Year 2022)
Findings	No findings were raised.
Conclusion	No project emissions are required to be calculated.

E.5.7.3. Calculation of leakage

Means of verification	The PoA-DD/1/, VPA-DDs/2/ and applied monitoring methodology/08/ does not prescribe any leakage emissions to be considered. The onsite visit conducted, and project design also did not reveal any potential source to be considered in this regard.
Findings	No findings were raised.

Conclusion	No additional leakage emissions (other than what is already considered in baseline calculations) were required in accordance with the methodology AMS III A.R v 7.0/08/

E.5.7.4. Calculation of net benefits or direct calculation for each SDG Impact

Means of verification

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

The calculation methods applied for all the SDG impacts were checked with PoA-DD/1/ and VPA-DDs/2/. The verification team confirms that the stated figures were checked and found acceptable.

Findings	No finding was raised.
Conclusion	The verification team confirms that e) The complete data was available and is duly reported; f) As indicated above, the description with regard to cross-check of reported data is included under respective parameter (refer Section E.5.4 and section E.6.4 of this report); g) Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals, project emissions and leakage emissions were followed; h) Appropriate emission factors, IPCC default factors/30/ and other reference values were correctly applied.

E.6. Comparison of actual SDG Impacts with estimates in approved PDD

Means of verification

Year 1: 2020

SDGs Targeted	SDG Impact	Values estimated in ex ante calculation of approved PoA-DD for this monitoring period	Actual values achieved during this monitoring period
13	Climate Action	SLS 6,409	SLS 4,694
		WPS 17,227	WPS 12,300

1	No Poverty	94.70%	53.61%
6	Clean water and Sanitation	13,088	13,068
7	Affordable and clean energy	SLS 23,425	SLS 75,505
		WPS 91,245	WPS 13,800
8	Decent Work and Economic Growth	20 jobs	50 jobs

Year 2: 2021

SDGs Targeted	SDG Impact	Values estimated in ex ante calculation of approved PoA-DD for this monitoring period	Actual values achieved during this monitoring period
13	Climate Action	SLS 12,443	SLS 8,188
		WPS 33,445	WPS 23,240
1	No Poverty	94.70%	51.98%
6	Clean water and Sanitation	13,088	12,707
7	Affordable and clean energy	SLS 23,425	SLS 73,574
		WPS 91,245	WPS 13,418
8	Decent Work and Economic Growth	20 jobs	50 jobs

Year 3: 2022

SDGs Targeted	SDG Impact	Values estimated in ex ante calculation of approved PoA-DD for this monitoring period	Actual values achieved during this monitoring period
13	Climate Action	SLS 12,443	SLS 6,792
		WPS 33,445	WPS 21,176
1	No Poverty	94.70%	48.56%
6	Clean water and Sanitation	13,088	12,618
7	Affordable and clean energy	SLS 23,425	SLS 71,297
		WPS 91,245	WPS 13,418

	<table><tr><td>8</td><td>Decent Work and Economic Growth</td><td>20 jobs</td><td>50 jobs</td></tr></table> The actual SDG targets against the anticipated values in PoA-DD/01/ and VPA-DDs/02/ is lower for all the SDGs except SDG 8 as tabulated above. The primary reason being in the PoA-DD and VPA-DDs sales for the respective technology are much lower than expected in the VPA-DDs. Thus, the achieved SDG targets are much lower than anticipated.
Findings	No findings were raised.
Conclusion	The actual emission reductions achieved in the current monitoring period for the VPAs is lower than the emission reductions as well as for other SDG targets stated in the VPA-DDs/2/. Therefore, it has been accepted by the verification team.

E.6.1. Remarks on increase in achieved SDG Impacts from estimated value in approved PDD

Means of verification	The Monitoring Report /40/ and corresponding ER calculations sheet /05/, show that the actual emission reductions achieved for project technologies i.e., WPS and SLS during this monitoring period are less than the estimate provided in VPA-DDs/2/.
Findings	No findings were raised.
Conclusion	No justification was sought from the PD because the achievement of emission reductions were lower than what had been estimated.

E.7. Safeguarding reporting

Principles	Mitigation Measures added to the Monitoring Plan	Assessment/Observation
Principle 6.1. Labour Rights		
The Project Developer shall ensure that all employment is in compliance with national labour occupational health and safety laws and with the principles and standards embodied in the ILO fundamental conventions	The CME had made sure that all employment complies with regional labour laws and regulations. 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.	As verified by the VVB through the employment records/29/ and contracts no employee was found to be 18 years of age which is in line with national labour laws
Principle 9.4 Release of pollutants.		
Could the Project potentially result in the release of pollutants to the environment?	The project distributed clean energy products which required a appropriate handling at their end of life to avoid release of pollutants at end of life. The PP has been accounted for this and ensured the mitigation measures are in place at the time of monitoring, including procurement of waste scrap, which has been documented in the monitoring report.	VVB has verified and evident through the interviews of Evangelical Social Action Forum (ESAF). The water purification system is implemented by Evangelical Social Action Forum (ESAF) staff, if any waste scrap disposal happened in the current monitoring, the information confirmed by the photographic evidence of sample receipts/51/ shared by the CME.

E.8. Stakeholder Inputs and Legal Disputes

Means of verification	Since there were no negative comments reported in the Grievance mechanism for the current period, as confirmed from the logbooks and interviews of the end users, this section is not applicable. No Legal disputes have been indicated by the CME and PO during the interviews. CME has added declaration in the monitoring report indicating that no legal contest has arisen during this monitoring period. The stakeholder mitigations that were agreed to be monitored include aftersales mechanism to ensure customer complaints are registered and addressed continuously. Interviews of end-users were conducted by the VVB representatives, and all end-users confirmed that they were aware of the complaints mechanism and had contact information of the PO representatives in case they have any complaints regarding the CEPs. The measures to address such complaints may include repair or replacement of CEPs, depending on the degree of damage. The Continuous input / Grievance Expression process book is available at the office of Local Partner organization for those who don't have the access to electronic media for expressing their concerns and the end users can also register their complaint / grievance through the email customecare@bandhanbank.com, info@cedarretail.in, help@goldstandard.org, info@muthoot.com, indira.ghosh@arohan.in. During the current monitoring period, 1,221 WPS repairs were done for VPA 5. For SLS, total repairs done were 1,566 in VPA 5. These have been confirmed by the ER Sheets/5/ of the respective VPAs. A step wise approach has been adopted by the CME for aftersales mechanism to resolve customer complaints. The steps involved are: 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) VVB confirms that all the technical failure and maintenance protocol has been appropriately listed by the CME in the MR.
Findings	No findings were raised.
Conclusion	Not Applicable

SECTION F. Internal quality control

The draft verification report that is prepared by the verification team is reviewed by an independent technical review team (one or more members) to confirm if the internal procedures established and implemented by Earthood were duly complied with and such opinion/conclusion is reached in an objective manner that complies with the applicable GS4GG requirements. The technical review team is collectively required to possess the technical expertise of all the technical area/sectoral scope the project activity relates to. All team members of technical review team are independent of the verification team.
During the technical review process, additional findings may be identified, or the closed-out findings may be opened, which needs to be satisfactorily resolved before the request for issuance is submitted to Gold Standard. The independent technical reviewer may either approve the report as such or reject/return the same in such case providing the comments/findings/issues that needs to be resolved by the verification team. The decision taken by the Technical Reviewer is final and is authorized on behalf of Earthood Services Private Limited.

SECTION G. Verification opinion

Earthood Services Private Limited (Earthood), contracted by Micro Energy Credits Corporation Private Limited, has performed the independent verification of the emission reductions for the GS Project GS11450 (VPA 05) in the host country "India" for the monitoring period 27/06/2020 to 31/12/2022 (both dates inclusive), as reported in the Monitoring Report, Version 2.0 dated 21/09/2023/40/. The 'MicroEnergy Credits' is responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity. Earthood commenced the verification against the baseline and monitoring methodology "AMS III.AR – Substituting fossil fuel-based lighting with LED/CFL lighting systems, Version 7.0"/08/ and Emission Reduction from safe drinking water supply v1.0, the monitoring plan contained in the VPA-DDs and Monitoring Report Version 2.0 dated 21/09/2023/40/.

VVB's verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. Earthood planned and performed the verification by obtaining evidence and other information and explanations that Earthood considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

The verification team confirms that:

- The PoA was found completely implemented as per the description given in the registered VPA-DDs.
- The actual operation conforms to the description in the registered PoA – DD/01/ and VPA- DDs/02/.

SECTION H. Certification statement

ESPL's verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. ESPL planned and performed the verification by obtaining evidence and other information and explanations that ESPL considered necessary to give reasonable assurance that the reported GHG emission reductions are fairly stated.
In our opinion, the GHG emissions reductions reported for the project activity are fairly stated in the Monitoring Report (final) Version 2.0 dated 21/09/2023/40/. ESPL, based on outcome of verification activities, certifies in writing that, during the monitoring period 27/06/2020 to 31/12/2022 (inclusive of both the dates) for VPA 05 and the registered GS PoA – GS11450 "MicroEnergy Credits – Microfinance for Clean Energy Product Lines – India" achieved the verified amount of 76,390 tCO_2e reductions for VPA 05 in anthropogenic emissions by sources of greenhouse gases that would not have occurred in the absence of the PoA.
The verified amount of emission reductions is stated below as per implemented VPAs and as per commitment period:

Verified and certified emission reductions as per monitoring period:

Monitoring period	VPA 05
27/06/2020 to 31/12/2020	WPS: 12,300 tCO_2e VERs SLS: 4,694 tCO_2e VERs Total: 16,994 tCO_2e VERs
01/01/2021 to 31/12/2021	WPS: 23,240 tCO_2e VERs SLS: 8,188 tCO_2e VERs Total: 31,428 tCO_2e VERs
01/01/2022 to 31/12/2022	WPS: 21,176 tCO_2e VERs SLS: 6,792 tCO_2e VERs Total: 27,969 tCO_2e VERs
Total	**76,390 tCO_2e VERs**

Appendix 1. Abbreviations

Abbreviations	Full texts
General	
ACM	Approved Consolidated Methodology
AM	Approved Methodology
BE	Baseline Emission
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
PP	Coordinating and Managing Entity
CL	Clarification Request
CO2	Carbon dioxide
CP	Crediting Period
DR	Desk Review
EB	Executive Board
EI	External Individual
ESPL	Earthood Services Private Limited
FAR	Forward Action Request
GHG	Green House Gas
GSC/GSP	Global Stakeholder Consultation Process
IPCC	Intergovernmental Panel on Climate Change
IR	Internal Resource
KP	Kyoto Protocol
LSC	Local Stakeholder Consultation Process
MoC	Modalities of Communication
MoV	Means of Verification
MP	Monitoring Plan
ODA	Official Development Assistance
PA	Project Activity
PCP	Project Cycle Procedure
PD	Project Developer
PDD	Project Design Document
PE	Project Emission
PoA	Programme of Activities
PoA DD	Programme of Activities Design Document
PS	Project Standard
RCP	Renewal of Crediting Period
RFR	Request for Registration
TcO2e	tonnes of Carbon di Oxide equivalent

TPH	Tonnes Per Hour
TR	Technical Reviewer
UNFCCC	United Nations Framework Convention on Climate Change
V	Version
VPA	Verified Project Activity
VVB	Validation and Verification Body
VVS	Validation and Verification Standard
Project Specific	
ICS	Improved Cookstove
GS4GG	Gold Standard for Global Goals
EPC	Electric Pressure Cooker
LSC	Local Stakeholder Consultation
MoV	Means of Verification
SDG	Sustainable Development Goals
WPS	Water Purification System technology

Appendix 2. Competence of team members and technical reviewers

Competence Statement			
Name	Sukanya Phukan		
Education	M.Sc (Environmental Science and Technology) B.Sc (Zoology)		
Experience	1+ year		
Field	Environment Science		
Approved Roles			
Team Leader	YES (VM only)		
Validator	YES (VM only)		
Verifier	YES (VM only)		
Local expert	NO		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (X.X)	YES (VM TA 1.2, 3.1)		
Reviewed by	Shifali Guleria (Quality Manager)	**Date**	23/06/2023
Approved by	Deepika Mahala (Technical Manager)	**Date**	23/06/2023

Competence Statement	
Name	Vaishali Yadav
Education	M.Sc. environmental studies
Experience	-
Field	Climate Change & Environment / Industry
Approved Roles	
Team Leader	NO
Validator	NO
Verifier	NO
Methodology Expert	NO
Local expert	NO
Financial Expert	NO
Technical Reviewer	NO
TA Expert (X.X)	NO
Trainee	YES

Reviewed by	Shifali Guleria (Quality Manager)	**Date**	12/07/2023
Approved by	Deepika Mahala (Technical Manager)	**Date**	12/07/2023

Competence Statement			
Name	Shreya Garg		
Country	India		
Education	M.Sc. (Climate Science & Policy), TERI University		
Experience	9 Years +		
Field	Climate Change		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS.I.A., AMS.I.C., AMS.I.D., AMS.I.F., AMS.II.D., AMS.II.G., AMS.II.J., AMS.III.AV., AMS.III.BL, ACM0002, ACM0012		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (TA 1.1, TA 1.2, TA 3.1, TA 13.1)		
Reviewed by	Shifali Guleria	**Date**	21/12/2022
Approved by	Deepika Mahala	**Date**	21/12/2022

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1.	MEC	PoA-DD	Version 4.0 dated 05/01/2023	CME
2.	MEC	VPA-DD VPA 05	Ver. 05dated 28/03/2023	CME
3.	ESPL	Validation Report for inclusion of VPA	Version 4.0, dated 82/03/2023	Others
4.	GS4GG	Monitoring report template Guide	Version 1.1, published on 14/10/2020	GS4GG
5.	MEC	ER Calculation Summary Sheet_VPA 05	Pertaining to latest MR	PP
6.	MEC	MEC	Waste scrap disposal sample receipts	-
7.	MEC	Annual Hygiene Campaign Records	-	PP
8.	UNFCCC	AMS-III.AR – Substituting fossil fuel-based lighting with LED/CFL lighting systems	Version 7.0	Others
9.	GS4GG	Emission Reduction from safe drinking water supply	Version 1.0	GS4GG
10.	CDM	CDM webpage of the PoA: https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/B46TH0V2GLIZK1UPWJ3SMNA8QRX7FY/view	Last accessed on 13/10/2022	Others
11.	The Gold Standard Foundation	GS webpage of the PoA: https://registry.goldstandard.org/projects/details/3501	Last accessed on 15/09/2023	Others
12.	MEC	Carbon Title transfer document	-	PP
13.	MEC	Sales Records	Various	PP
14.	MEC	Census Records	-	PP
15.	MEC	Spot check user records and the pictures of the PWS	-	PP
16.	MEC	Training records	-	PP
17.	MEC	Monitoring survey reports for parameters monitoring for WPS	-	PP

		and SLS		
18.	MEC	Questionnaire used during the survey for each type of CEP	December 2020	PP
19.	MEC	Technical specifications of SLS (Various)	-	PP
20.	MEC	Original copies of sales receipts / invoices/ warranty cards	-	PP
21.	UNFCCC	CDM PS for PoA	Version 3.0	Others
22.	UNFCCC	CDM VVS for PoA	Version 3.0	Others
23.	UNFCCC	Standard: sampling and surveys for CDM project activities and programme of activities	Version 9.0	Others
24.	UNFCCC	Guidelines: sampling and surveys for CDM project activities and programme of activities	Version 4.0	Others
25.	GS4GG	Principle and requirements	Version 1.2	Others
26.	GS4GG	PoA Requirements	Version 2.0	Others
27.	GS4GG	CSA Requirements	Version 1.2	Others
28.	GS4GG	GHG emission reduction and sequestration product requirements	Version 2.2	Others
29.	MEC	Employment Records	-	PP
30.	IPCC	IPCC Guidelines for National Greenhouse Gas Inventories 2.1 (http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf)	-	Others
31.	GS4GG	Form: GS-MR-FORM	Version 1.1, Dated 14/10/2020	Others
32.	MEC	Training photos, Records	-	PP
33.	The Gold Standard Foundation	REQUIREMENTS AND GUIDELINES USAGE RATE MONITORING,	-	PP
34.	IPCC	GWP: IPCC AR4 https://www.ipcc.ch/site/assets/uploads/2018/02/ar4-wg1-chapter2-1.pdf	-	Others
35.	IPCC	GWP: IPCC AR5, https://www.ipcc.ch/assessment-report/ar5/	-	Others
36.	MEC	Grievance Logbook	-	Others
37.	MEC	MEC and PO's agreement	-	PP
38.	MEC	Manufacturer Specification of WPS (Various)	-	PP
39.	MEC	Quarterly and annual monitoring survey forms	Filled	PP
40.	MEC	Monitoring Report (final)	Version 2.0, dated 21/09/2023	PP

41.	MEC	Credit tracker platform screenshots/ online – output file	-	PP
42.	MEC	Grievance Logbook	-	PP
43.	MEC	Credit Tracker Platform Screenshots	-	PP
44.	MEC	Tracker output file	-	PP
45.	UNFCCC	Tool 30: Calculation of the fraction of non-renewable biomass	Version 4.0	Others
46.	UNFCCC	Community Services Activity Requirements	Version 1.2	Others
47.	ESPL	On-Site audit records	-	Others
48.	MEC	National Water Policy (2012) and the Jal Jeevan Mission(2019-2024)/	-	Others
49.	MEC	Laboratory tests for Water Quality	-	PP
50.	BIS	the Indian Standard drinking water specification (IS 10500:2012) http://cgwb.gov.in/documents/wq-standards.pdf	2012	Others
51.	MEC	Sample Water quality test reports	VPA5 (Kerala) dated 28/01/2022.	CME

Appendix 4. Clarification requests, corrective action requests and forward action

Table 1. Remaining FAR from validation and/or previous verification

FAR ID	01	**Section no.**		**Date :** DD/MM/YYYY
Description of FAR				
NA				
Project participant response				**Date :** DD/MM/YYYY
Documentation provided by project participant				
VVB assessment				**Date:** DD/MM/YYYY

e.g., There is no finding from validation or previous verification report.

Table 2. CL from this verification

CL ID	NA	**Section no.**		**Date :** DD/MM/YYYY
Description of CL				

NA
Project participant response **Date :** DD/MM/YYYY
Documentation provided by project participant
VVB assessment **Date:** DD/MM/YYYY

Table 3. CAR from this verification

CAR ID	NA	**Section no.**		**Date :** DD/MM/YYYY
Description of CAR				
NA				
Project participant response				**Date :** DD/MM/YYYY
Documentation provided by project participant				
VVB assessment				**Date:** DD/MM/YYYY

Table 4. FAR from this verification

FAR ID	NA	**Section No.**		**Date :** DD/MM/YYYY
Description of FAR				
NA				
Project participant response				**Date :** DD/MM/YYYY
Documentation provided by project participant				
VVB assessment				**Date:** DD/MM/YYYY