Verification and certification report form for GS Programme of Activities

(Version 04.0)

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION	
Title and UNFCCC reference number of the programme of activities (PoA)	Solar Water Heater Program in India GS ID reference number- 3378
Version number(s) of the PoA-DD(s) to which this report applies	CDM PDD: Version: 07, Dated: 29/08/2016
GS ID (s) of the VPAs	Solar Water Heater Program in India -VPA - 02 - GS 4613 Solar Water Heater Program in India -VPA - 03 - GS 4614 Solar Water Heater Program in India -VPA - 04 - GS 4615 Solar Water Heater Program in India -VPA - 05 – GS 6139 Solar Water Heater Program in India -VPA - 06 – GS 6356 Solar Water Heater Program in India -VPA - 07 – GS 7602
Version number of the verification and certification report	1.2
Completion date of the verification and certification report	01/12/2023
Monitoring period number and duration of this morning period	VPA 02 – 6th MP, (01/01/2022 to 31/03/2022) VPA 03 - 6th MP, (01/01/2022 to 12/04/2022) VPA 04 - 6th MP, (01/01/2022 to 12/04/2022) VPA 05 – 6th MP, (01/01/2022 to 31/03/2023) VPA 06 – 6th MP, (01/01/2022 to 31/03/2023) VPA 07 – 3rd MP, (01/01/2022 to 31/03/2023) (Inclusive of both days)
Number and version number of the monitoring report to which this report applies	Version 04 , Dated – 01/12/2023
Activity Requirements applied	N/A
Product Requirements applied	GHG Emission Reduction & Sequestration
Coordinating/managing entity (CME)	Nuetech Solar Systems Pvt. Ltd.
Host Country	India
Applied methodologies and standardized baselines	AMS-I.C - Thermal energy production with or without electricity, Version 19
Mandatory sectoral scopes	1(1.1)
Target SDGs	SDG 3:- Good Health and Well Being SDG 4:- Quality Education SDG 7:- Affordable and Clean Energy

	SDG 8:- Decent Work and Economic Growth SDG 9:- Industry, Innovation and Infrastructure SDG 13:- Climate Action SDG 17:- Partnerships for the Goals
Conditional sectoral scopes, if applicable	Not Applicable
Estimated amount of GHG emission reductions or GHG removals for this monitoring period in the included VPAs covered in this report	VPA 2 – 7,810 tCO_2e VPA 3 – 8,791 tCO_2e VPA 4 – 8,879 tCO_2e VPA 5 – 44,241 tCO_2e VPA 6 – 47, 210 tCO_2e VPA 7 – 22,816 tCO_2e TOTAL - 139,747 tCO_2e
Name and UNFCCC reference number of the VVB	E-0052: Carbon Check (India) Private Ltd.
Name, position and signature of the approver of the verification and certification report	 Sanjay Kumar Agarwalla, Technical Director

SECTION A. Executive summary

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Introduction:

The Coordinating and Managing Entity/Project Developer has appointed the VVB, Carbon Check (India) Private Ltd. (CCIPL) to perform an verification of the GS Programme of Activities, " Solar Water Heater Program in India" (hereafter referred to as "Programme of Activities or PoA") for the VPAs titled "Solar Water Heater Program in India – VPA-02"; " Solar Water Heater Program in India – VPA No 03"; "Solar Water Heater Program in India – VPA-04"; "Solar Water Heater Program in India – VPA-05"; "Solar Water Heater Program in India – VPA-06"; "Solar Water Heater Program in India – VPA-07";

The project activity involves installation of Solar Water Heaters (SWHs) in residential as well as commercial buildings throughout India. The programme saves electricity generated from fossil fuel by using renewable energy to meet hot water requirements, resulting in lower CO_2 emissions. The SWHs installed under VPAs of the PoA, are intended to reduce emissions by replacing fossil fuel-generated electricity with renewable energy to meet hot water demand for various applications. The CME and VPA implementer are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the Voluntary project activities.

This report summarises the findings of the verification of the project, performed on the basis of paragraph 62 of the CDM Modalities & Procedures and GS4GG requirements /B08-a/, as well as criteria given to provide for consistent project operations, monitoring and reporting and the subsequent decisions by the CDM Executive Board and Gold Standard. Verification is required for all registered GS project activities intending to confirm their achieved emission reductions and proceed with request for issuance of VERs. This report contains the findings and resolutions from the verification and a certification statement for the certified emission reductions.

Objective:

Verification is the periodic independent review and ex-post determination of both quantitative and qualitative information by a VVB of the monitored reductions in GHG emissions that have occurred as a result of the registered GS project activity during a defined monitoring period.

Certification is the written assurance by a VVB that, during a specific period in time, a project activity achieved the emission reductions as verified.

The objective of this verification was to verify and certify emission reductions reported for the "Solar Water Heater Program in India" in the host country India, for the period 01/01/2022 – 31/03/2023 (inclusive of both the dates).

The purpose of verification is to review the monitoring results and verify that the monitoring was implemented according to the monitoring methodology and the monitoring plan in the PoA /VPAs /B04/ and used to confirm that the reductions in anthropogenic emissions by sources, are sufficient, definitive and presented in a concise and transparent manner. CCIPL's objective is to perform a thorough, independent assessment of the implementation of the registered programme of activities / VPA-DDs /B04/.

In particular, the monitoring plan, monitoring report and the project's compliance with relevant UNFCCC and host Party criteria are verified in order to confirm that the Voluntary project/s has/have been implemented in accordance with the previously registered/included Voluntary project design and conservative assumptions, as documented. It is also confirmed if the monitoring plan is in compliance with the registered/included VPA-DDs and the approved monitoring methodology.

Scope:

The scope of the verification is:

- To verify the project implementation and operation with respect to the registered/included VPA-DDs.
- To verify the implemented monitoring plan with the registered/included VPA-DDs or approved revised VPA-DDs and applied baseline and monitoring methodology.
- To verify that the actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan.
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement.
- To verify that reported GHG emission data is sufficiently supported by evidence.

The verification shall ensure that the reported emission reductions are complete and accurate, in order, to be certified.

The verification comprises a review of the monitoring report covering the monitoring period from 01/01/2022 – 31/03/2023 and based on the registered/included VPA-DDs including the monitoring plan, emission reduction calculation spreadsheet, monitoring methodology and all related evidence provided by project participant.

The verification team assigned by the VVB concludes that the PoA (version 07, dated 29/08/2016) /B04/, VPA-02 (Version 7, dated 17/10/2019), VPA-03 (Version 7, dated 17/10/2019), VPA-04 (Version 6, dated 25/09/2019), VPA-05 (Version 4, dated 25/09/2019), VPA-06 (Version 4, dated 25/09/2019), and VPA-07 (Version 3.1, dated 26/10/2020), as described in the VPA-DDs /B04/, Approved GS4GG Transition Document: dated 11/06/2018 and the monitoring report (version 4.0; dated 01/12/2023) /01-d/, meet all relevant requirements of the GS4GG requirements /B08/ and UNFCCC for CDM project activities including article 12 of the Kyoto Protocol and paragraph 62 of CDM M & P, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board and Gold Standard. The verification has been conducted in-line with the GS4GG VVS, version 1.0/B08-c/ and CDM VVS for PoAs requirements Version 03.0 /B01/.

The Voluntary project activities were correctly implemented according to selected monitoring methodology, monitoring plan and the approved revised VPA-DD/s. The monitoring system was implemented, maintained in a proper manner, while collecting monitoring data allowed for the verification of the amount of achieved GHG emission reductions. Through the review and on-site inspection and interviews, the verification team confirms that VPA-02 to VPA-07 of the PoA, has resulted in 139,747 tCO_2e emission reductions during the monitoring period.

CCIPL, as a VVB, is therefore pleased to issue a positive verification opinion expressed in the attached Certification statement (All the raised findings have been successfully closed. Please refer to Appendix 4 for further details).

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team members

Carbon Check (India) Private Ltd. has appointed a competent team as per the UNFCCC Accreditation Standard, GS4GG requirements and CCIPL's internal procedures. Further details regarding team competence can be found in Appendix 2. The team is outlined below:

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of VVB or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader/ Technical Expert	IR	Kishore Raychoudhury	Rishi	CCIPL	X	X	X	X
2.	Trainee Assessor	IR	Raj	Piyush	CCIPL	X	NA	NA	X

B.2. Technical reviewer and approver of the verification and certification 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	ER	Seshan	Ranganathan	CCIPL
2.	Approver	IR	Agarwalla	Sanjay Kumar	CCIPL

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.	*Human Error: Recording and reporting of the information in the ER spreadsheet.*	*Low*	*All the ER spreadsheet data of the SWHs, including sales database, including data calculation.* *This includes all the parameters to be monitored ex-post as per the PoA DD/VPA-DDs/B04/*	*The risk was mitigated by reviewing the training of the personnel involved in the data capture, calculation and by following the monitoring responsibilities. The training records will be reviewed which will also be confirmed during the on-site visit interviews.*
2.	*Information System: Use of spreadsheets without adequate controls related to data changes/updates, version tracking, traceability, security*	*Low*	*The data is recorded in the spreadsheets based on the information entered into various customised software such as Manufacturing Plus and Customer Support Manager (CSM). The access to the*	*The identified risk was by reviewing the management of access to the records. It will be confirmed through interviews whether the raw data of electricity is collected by the trained personnel and then transmitted and stored electronically to the CME's*

			spreadsheets for calculation of ERs, monitoring and sales database	*office. The data quality control to be checked.*
3.	*Sample*	*Medium*	*Sample size is not suitable or the surveyed SWHs at the VPA level are not random.*	*Cross-check the procedure to identify the sample size against the sampling guideline and standard and confirm the sample size is calculated correctly.*

C.2. Consideration of materiality in conducting the verification

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The threshold of materiality was evaluated based on para. 13 of "Guideline: Application of materiality in verifications" Version 02.0 and para. 30 of GS VVS for PoAs, version 03.0 /B01/. It was concluded that the materiality threshold applicable to the project activity based on actual emission reductions achieved is 5% of 139,747 tCO_2e which is equal to 6,987 tCO_2e.

In planning the verification, the verification team took cognizance of para.11 and 12 of the "Guideline: Application of materiality in verifications" Version 02.0. A materiality threshold of 6,987 tCO_2e is determined in line with para.306 (d) of CDM VVS for PoAs, version 03.0 and §17.2 and §17.3 of GS4GG VVS version 1.0 /B08-c/.

Based on the above, activities in which risks were assessed were:

1. Monitoring system including the data input procedure (including relevant personnel and applicable template forms used)
2. Copy of the agreement between household and Project Participant (s) (origin of data)
3. SWHs unique ID system
4. ER sheet (application of data)
5. Data flow
6. Data control procedures
7. Monitoring survey records

In conducting the verification, VVB took cognizance of para.13-17 of the "Guideline: Application of materiality in verifications" Version 02.0 /B09/ and based on the input of data from different sources checked through sampling of records during on-site visit interviews. Data flow was checked through comparison of data in hand-written forms, electronic database and ER sheet /02/. The competence of the personnel involved in conducting the SWHs performance testing, recording of data and calculation of the emission reductions data has been checked by the verification team by means of on-site visit interviews.

The risks identified can be mitigated through cross check with all sets of documents. The verification team performed the following checks in order to mitigate the effects of the above-identified sources of error:

Mitigation of Human error risks: The verification team mitigated the risk by checking the training records /8/ of the personnel and assessing their competencies, skills, monitoring / testing procedure followed, understanding of the monitoring survey form / SWHs Performance protocol and testing procedure etc. during the on-site visit interviews. Further, data was crosschecked with the ER calculation spreadsheet /2/ and the raw data.

Mitigation due to error in Information system: Verification team by conducting interviews with the personnel responsible for such activities mitigated the risk due to error in information system. It was confirmed through interviews that the data entered into the various customized software is collected and then transmitted and stored electronically at CME's office. The data quality control is maintained by the CME.

Mitigation due to error in Sampling: The verification team mitigated the risk by checking the ER sheet /02/ for each VPAs, list of random samples /17/ generated for monitoring surveys for VPAs and sample size calculation sheet /05/ and interviews with personnel responsible for the same.

In conducting the verification, VVB took cognizance of para.13-17 of the "Guideline: Application of materiality in verifications" (version 02.0) /B09/ and based on the input of data from different sources checked through sampling of records during on-site visit interviews.

Based on the assessment carried out, CCIPL confirms with a reasonable level of assurance that the claimed emission reductions are free from material errors, omissions or misstatements.

SECTION D. Means of verification

D.1. Desk/document review

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The verification was performed primarily based on the review of the Monitoring report /01-d/ and the supporting documentation. This process included review of data and information presented to verify their completeness and review of the monitoring plan and monitoring methodology /B02/. Documents reviewed or referenced during the verification are listed in Appendix 3 below.

D.2. On-site inspection

The verification team has carried out on-site inspection and interviews in order to assess the information included in the monitoring report and monitoring measurement procedures adopted during the monitoring period. During the desk review, the relevant monitoring records were checked. Previous periodic monitoring reports and verification reports (for CDM and GS) , photographs of the instruments, soft copy of original survey records and SWHs performance records were used to cross check consistency of information.

Through the review of validation reports, previous verification reports, comparing the relevant evidence and interview with the CME's representatives, CCIPL has confirmed that the project is implemented in line with the PoA-DD / VPA-DDs during the monitoring period. There is no change of the project design, operation and monitoring plan.

On-site inspection and interviews were performed by verification team in order to assess the following:

Duration of on-site inspection: 24/07/2023 to 25/07/2023 (High Radiation) and 27/07/2023 to 28/07/2023 (Low Radiation)				
No.	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.	Opening Meeting and brief project description by the CME; check the project data base / sales records / end user agreement for the total number of SWHs installed under the VPAs.	VPA implementer's office	High radiation : 24/07/2023 to 25/07/2023 Low radiation: 27/07/2023 to 28/07/2023	Rishi K. Raychoudhury
2.	Compliance of Monitoring plan with the applied methodology and registered monitoring plan; project implementation and operation as per the PoA-DD/VPA-DDs.	VPA implementer's office	High radiation : 24/07/2023 to 25/07/2023 Low radiation: 27/07/2023 to 28/07/2023	Rishi K. Raychoudhury
3.	Discussion on the monitoring survey and performance test process; review of QA/QC process, including interview/competency assessment (abilities, qualifications and recognition of involved personnel and institutions of the measuring team) of person/institution responsible for conduction of survey; Review of monitored data, Discussion on Monitoring report and ER calculation spread sheets	VPA implementer's office	High radiation : 24/07/2023 to 25/07/2023 Low radiation: 27/07/2023 to 28/07/2023	Rishi K. Raychoudhury
4.	Physical site visit (to check project implementation and operation and sample households from CME/PP's survey samples)	End user house visit	High radiation : 24/07/2023 to 25/07/2023 Low radiation: 27/07/2023 to 28/07/2023	Rishi K. Raychoudhury
5.	Discussion on OSV findings and Closing meeting.	VPA implementer's office	High radiation : 24/07/2023 to 25/07/2023 Low radiation: 27/07/2023 to 28/07/2023	Rishi K. Raychoudhury

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	AK	Rudrappa	Beneficiary	24/07/2023	Monitoring survey	Rishi K Raychoudhury
2.	Anitha	Vidya	Beneficiary tenant		Monitoring survey	
3.	-	Veena	Beneficiary tenant		Monitoring survey	
4.	Padmanabha	Sudha	consultant		Project implementation and operation, monitoring procedure, data and information flow, VER calculation and completeness of monitoring report, QA/QC Procedures, Management and operating system	
5.	S.	Sushmitha	Nuetech Solar		Data and information flow, Management and operating system Database management, monitoring survey	
6.	H.T	Jagdeesh	Nuetech Solar			
7.	-	Balgopala	Infy Solar			
8.	-	Prathap	Infy Solar			
9.	-	Vidya	Beneficiary Tenant		Monitoring survey	
10.	Shetty	Shama	Beneficiary Wife		Monitoring survey	
11.	M	Kavya	Beneficiary – employee girls hostel		Monitoring survey	
12.	Kumar	Surendra	Nuetech Solar	25/07/2023	Project Implementation, Sales, records Monitoring Survey, QA/QC, operation, monitoring procedure, data and information flow, Database management, Human resource management, identification of training needs Data and information flow, Management and operating system	
13.	Ramamurthy	Baby	Nuetech Solar			
14.	Y.M	Ramesh	Nuetech Solar			
15.	Mury C.	Anjanaian	Nuetech Solar			
16.	-	Hemalatha	Nuetech Solar			
17.	H.C	Jairama	Beneficiary respondent		Monitoring survey	
18.	Kulkarni	Rama	Beneficiary respondent		Monitoring survey	
19.	S.	Nagamma	Beneficiary respondent		Monitoring survey	
20.	Kulkarni	GA	Beneficiary respondent		Monitoring survey	
21.	-	Sumithra	Beneficiary respondent		Monitoring survey	

22.	Verma	Loveesh	Beneficiary Husband	27/07/2023	Monitoring survey	
23.	Chandra Pandey	Girish	Beneficiary respondent		Monitoring survey	
24.	-	Shanti	Beneficiary wife		Monitoring survey	
25.	C. Verma	Mahesh	Beneficiary respondent		Monitoring survey	
26.	Singh	Prateek	Beneficiary respondent		Monitoring survey	
27.	K U Sah	kanchan	Beneficiary respondent		Monitoring survey	
28.	Bahadur Singh	Jang	Beneficiary respondent	28/07/2023	Monitoring survey	
29.	Chandel	Narendra	Beneficiary		Monitoring survey	
30.	Lal	Mohan	Beneficiary Son		Monitoring survey	
31.	Singh	Mahavir	Beneficiary		Monitoring survey	
32.	Singh	Dara	Beneficiary		Monitoring survey	

D.4. Sampling approach

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As assessed in above sections, emission reductions for the Six VPAs – VPA 02 to VPA 07 (GS 4613, GS 4614, GS 4615, GS6139, GS6356 and GS7602) are being claimed for this monitoring period and the total population of the SWHs installed under these six VPAs are as below:

Sr. No.	VPA Reference No.	Number of SWHs Installed
1	VPA 02 - GS 4613	14,562
2	VPA 03 - GS 4614	18,357
3	VPA 04 - GS 4615	16,953
4	VPA 05 – GS 6139	17,166
5	VPA 06 – GS 6356	19,386
6	VPA 07 – GS 7602	20,097
Total		**106,521**

The monitoring parameters required to be monitored through the sampling plan are:

1. Continuous operation of the equipment/system for Category I systems (D), consisting of two components,

- Recording annually the number of systems operating
- Estimating the annual hours of operation of an average operational system

Stratified sampling was applied by the CME for selection of the monitoring samples with 95/10 confidence/precision for a single sampling plan for all the parameters which is deemed acceptable as per the PoA/ VPAs. For the Continuous operation of the equipment/system for Category I systems, sampling frames chosen consists of the division of the category I systems in two strata. The first consists of systems in states with high radiation and the second strata of systems in states with lower radiation. A single sampling plan was used as the population of Category I systems is homogenous, this was checked by the verification and was found to be in line with the PoA-DD / VPA-DDs.

As per paragraph 25 of the Sampling Standard, version 09 /B07/, the verification team has to verify whether the project participants or the coordinating/managing entity have implemented the sampling and surveys according to the sampling plan in the registered monitoring plan /13/. The verification includes determining:

(a) Whether the required confidence/precision has been met;

(b) Whether the selected sample was representative of the population.

Monitoring was conducted for this monitoring period. The results of sampling surveys are verified by the VVB by using acceptance sampling during on-site interviews carried out on 24/07/2023 to 25/07/2023 (High radiation) and 27/07/2023 to 28/07/2023 (Low radiation)

In line with paragraph 26 of the Sampling Standard, the verification team has applied a sampling approach for on-site visits surveys as part of verification. Now as the CME had applied sampling approach, the verification team has chosen acceptance sampling in accordance with paragraph 28 of the sampling standard and accordingly steps listed in paragraph 29 of the sampling standard /B07/ were followed.

VVB used sampling during verification for checking the continuous operation of the equipment/system for category I systems. A sample size of 11 was chosen for each strata (High radiation and Low radiation region) i.e., in total 22 samples. A sample size of 11 was required/B07/, based on an AQL of 0.5% and UQL of 20 %, producer risk of and consumer risk of 10% each in determining the VVB's sample size. Acceptance number (c) thus determined for the samples is 0. VVB visited 11 samples in High radiation region and 11 samples in Low radiation region, all 22 SWHs were found to be operational and this matched with the CME's records and hence no discrepant records were observed with the MR /01-d/ and ER sheet /02/ and thus c=0. Thus, CME's set of records has been accepted in line with § 33 of the sampling standard, version 09 /B07/. Verification team has cross verified these sample documents during the on-site visit and the remote interview.

The sampling plan implemented by the CME is in accordance with the applied approved monitoring methodology /B02/ and the PoA-DD/VPA-DDs /B04/. The CME has appropriately performed Sampling procedure in line with the applied methodology and PoA-DD / VPA-DDs /B04/.

The necessary confidence / precision of 95/10 each of the parameters is met. This has been cross verified by the verification team from the supporting documents submitted.

SECTION E. Verification findings

E.1. General

E.1.1. Compliance of the monitoring report with the monitoring report form

Means of verification	Desk Review & Interview
Findings	CAR 1 & CAR 2 were raised and closed satisfactorily. Kindly refer appendix 4 for further details.
Conclusion	CME has used the GS4GG template Monitoring Report, version 1.1 /B03-1/. Verification team confirms that the latest available version of the monitoring report template /B03/ has been used by the CME and the MR is in compliance with the monitoring report form and related template guide Monitoring Report, version 1.1 /B03-2/. This confirms compliance with the §336 and §337 of CDM VVS for PoAs, version 03.0 /B01/and §17.2 of GS4GG VVS version 1.0 /B08-c/.

E.1.2. Remaining forward action requests from validation and/or previous verifications

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Not Applicable

E.2. Programme of activities

E.2.1. Compliance of the programme implementation with the registered programme design document

Means of verification	Desk Review & Interview
Findings	No finding raised.

Conclusion	CCIPL by means of on-site interviews and document review, assessed that all physical features (technology, project equipment, and monitoring equipment) of the included VPAs in the PoA /B04/ are in place and that the coordinating/managing entity has operated the PoA and the VPAs as per the PoA /B04/ and the VPAs /B04/. There are no deviations or proposed or actual changes in the implementation or operation of the PoA and the included VPAs. The verification team confirms that the actual operation of VPAs, implementation and operation are in compliance with the PoA / VPAs /B04/ in order to confirm the compliance of § 338, § 339 and § 340 of CDM VVS for PoAs, Version 03.0 /B01/ and §17.2 of GS4GG version 1.0 /B08-c/.

E.2.2. Implementation and operation of the management system

Means of verification	Desk Review & Interview
Findings	No finding raised.
Conclusion	The PoA management system including the record-keeping system has been explained in the PoA-DD /B04/. During the verification process, the verification team reviewed the management system based on a provided documents by PP and on-site interviews. Verification team confirmed that the management systems are in place to implement the monitoring of the project activity. This includes the roles and responsibilities of the monitoring staff, data collection, transfer and aggregation procedures, data storage and archiving procedure for the monitoring system. Monitoring surveys were conducted by in house team of Nuetech. In order to ensure completeness and accuracy of monitoring information, electronic database is operated and maintained by the VPA implementer. This information is further maintained by the CME, who verifies the reported sales with the number of SWHs produced. The data is further periodically checked by the CME to ensure there is no double counting. This provision for the avoidance of double counting as outlined in the PoA management system has been verified by means of review records of sales database and on-site interviews during the course of verification. It was confirmed during the on-site interviews and by checking the monitoring system that all the roles and responsibilities related to monitoring are fulfilled by representatives of CME and the VPA implementer. CME has Customer Support Manager Software (CSM) which maintain the records of maintenance details of SWHs. CME also have organizational chart mentioned in section C(a) where responsibility of each members in the organization defined which VVB found appropriate. The responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the monitoring plan /B04/. The details about monitoring system have been provided in the Monitoring report /1/. The data flow and management and reporting structure was also checked during the on-site interviews. The verification team confirms that the monitoring management system of the GS PoA is in place, with the responsibilities properly identified are in place. This confirms the compliance of § 338 (a) and § 345 (b) (iv) of CDM VVS PoAs Version 03.0 /B01/ and §17.2 and §17.3 of GS4GG VVS version 1.0 /B08-c/.

E.3. Voluntary project activities

E.3.1. Compliance of the VPA implementation with the included VPA design document

<table>
<tr><td>Means of verification</td><td>Document Review, Interview</td></tr>
<tr><td>Findings</td><td>No finding raised.</td></tr>
<tr><td>Conclusion</td><td>The implementation status of the PoA and the Voluntary project activities is:

<table>
<tr><td>Project Participants:</td><td>Nuetech Solar Systems Pvt. Ltd.</td></tr>
<tr><td>Title of PoA:</td><td>Solar Water Heater Program in India</td></tr>
<tr><td>GS Reference No:</td><td>PoA – GS 3378
VPA - 02 - GS 4613
VPA - 03 - GS 4614
VPA - 04 - GS 4615
VPA - 05 - GS6139
VPA - 06 - GS6356
VPA - 07 - GS7602</td></tr>
<tr><td>Applied Baseline and monitoring methodology:</td><td>AMS-I.C- Thermal energy production with or without electricity, Version 19 /B02/</td></tr>
<tr><td>Project Scale:</td><td>Small scale</td></tr>
<tr><td>Location of the project activity:</td><td>India</td></tr>
<tr><td>Reported monitoring Period verified in this verification:</td><td>01/01/2022 to 31/03/2023 (both days inclusive)</td></tr>
</table>

As a part of the on-site interviews, the verification team was able to confirmed that the Programme of activities and the Voluntary Project Activities' implementation are in accordance with the project description contained in the PoA-DD and included VPA-DDs /B04/.

The VPAs include installation of Solar Water Heaters (SWhs) in residential as well as commercial buildings throughout India. The VPA implementer is Nuetech Solar Systems Pvt. Ltd. The SWHs under the VPAs uses thermal energy of the sun to meet the hot water demand for various applications. These SWHs saves the electricity generated from fossil fuel by using renewable energy to produce hot water for various applications, resulting in reduction of CO_2 emissions.

The number of SWHs installed under each VPAs have been confirmed by the monitoring database and as stated below:

<table>
<tr><th>Sr. No.</th><th>VPA Reference No.</th><th>Number of SWHs Installed</th></tr>
<tr><td>1</td><td>VPA - 02 – GS 4613</td><td>14,562</td></tr>
<tr><td>2</td><td>VPA - 03 – GS 4614</td><td>18,357</td></tr>
<tr><td>3</td><td>VPA - 04 – GS 4615</td><td>16,953</td></tr>
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<tr><td colspan="2">Total</td><td>106,521</td></tr>
</table>

It was confirmed that Nuetech Solar Systems Pvt. Ltd. is the Coordinating/Managing Entity for the PoA. The actual Voluntary project activity/ies are in line with the VPA-DDs /B04/. Nuetech Solar Systems Pvt. Ltd. is also the VPA implementer for the VPAs.

The information (including data and variables) provided in the MR /1/ is in line with the details provided in the VPA-DDs /B04/.</td></tr>
</table>

	CCIPL's verification team considers the project description of the project contained in the PoA-DD and the VPA-DDs /B04/ to be complete and accurate. The VPAs comply with the relevant methodology, tools, forms and guidance. Verification team has assessed the project in order to check any proposed or actual changes to the project design in accordance with §267 of CDM VVS for PoAs, Version 03.0 /B01/. In the opinion of CCIPL, there is no change to the project design. CCIPL's verification team confirms that the VPAs are implemented within the boundary of the PoA as described in the PoA-DD. In the opinion of CCIPL, there is no change to the project design. CCIPL's verification team confirms that the VPAs are implemented within the boundary of the PoA as described in the PoA-DD /B04/ and the implementation and operation of the project activity has been conducted in accordance with the description contained in the PoA and VPAs. The verification team took cognizance of § 338, § 339 and § 340 of the CDM VVS for PoAs, version 03 /B01/ along with §17.2 & §17.3 of GS4GG VVS version 1.0 /B08-c/ to conduct the verification and on-site interviews in accordance with the § 319 and 320 of the CDM VVS for PoAs, version 03 /B01/ and §17.2 & §17.3 of GS4GG VVS version 1.0 /B08-c/.

E.3.2. Compliance of the registered monitoring plan with applied methodologies and standardized baselines

Means of verification	Document Review, Interview
Findings	No finding raised.
Conclusion	The verification team is able to confirm that the monitoring plan contained in the VPAs is in accordance with the approved methodology applied by the project activity, i.e. AMS-I. C, version 19 /B02/. The monitoring plan is in accordance with the approved methodology, AMS-I. C, version 19 /B02/, applied by the Voluntary project activities and as provided in the VPA-DDs /B04/. The verification took cognizance of § 341 to § 343 of CDM VVS for PoAs, Version 03.0 /B01/ and § 17.4 of GS4GG VVS /B08-c/.

E.3.3. Compliance of monitoring activities with the registered monitoring plan

The monitoring has been carried out in accordance with the monitoring plan contained in the VPAs /B04/. This conclusion has been made based on assessment below.

E.3.3.1. Data and parameters fixed ex ante or at renewal of crediting period

Means of verification	Document Review, Interview
Findings	CL 03 was raised and closed satisfactorily. Kindly refer appendix 4 for further details.
Conclusion	Verification team confirms that the Data and parameters fixed ex ante are in compliance with the VPAs /B04/ and the monitoring plan. Please refer Appendix 5 for detailed analysis of the ex-ante parameters. The verification took cognizance of § 344 of CDM VVS for PoAs, Version 03.0 /B01/ and § 17.4 of GS4GG VVS /B08-c/.

E.3.3.2. Data and parameters monitored

Means of verification	Document Review, Interview
Findings	CL 01 & CAR 03 were raised and successfully resolved. Please refer appendix 4 for further details.
Conclusion	The Verification team confirms that the Data and parameters monitored are in compliance with the VPAs and the monitoring plan /B04/. A complete assessment

	of each of the monitored parameters has been provided in Appendix 6 of the verification report. The verification took cognizance of § 344, § 345(b), §356 and §357 of CDM VVS for PoAs, Version 03.0 /B01/ and § 17.4 of GS4GG VVS /B08-c/.

E.3.3.3. Implementation of sampling plan

Means of verification	Document Review, Interview
Findings	CL 02 was raised and closed satisfactorily. Kindly refer appendix 4 for further details.
Conclusion	Monitoring surveys were conducted during the current monitoring period and the results are as follows: The total population of the SWHs installed under the six VPAs considered for the monitoring period is 106,521. The monitoring parameters required to be monitored through the sampling plan is: 1. “Continuous operation of the equipment/system for Category I systems”, consisting of two components, - Recording annually the number of systems operating - Estimating the annual hours of operation of an average operational system Across VPA, stratified sampling was applied for the six VPAs by CME for selection of the monitoring samples with 95/10 confidence/precision for all the two parameters for annual monitoring which is deemed acceptable as per the PoA /B04/ and VPAs /B04/. Applying the random number generator, the SWHs were randomly picked from the defined population, up to the required sample size as calculated by the CME /17/. The verification team confirms that the applied method for sample size calculation is in accordance with the PoA-DD / VPA-DDs /B04/. The actual sample size in all the cases was not less than either the calculated sample size or the minimum sample size as per the PoA-DD /B04/. For the mean parameters, Student’s t-distribution has been used since the resulting sample size was less than 30 and this is deemed acceptable in line with the Standard for sampling and surveys for CDM project activities and Programme of Activities, version 09 /B07/. For the monitoring parameter, ‘Recording annually the number of systems Operating, Estimating the annual hours of operation of an average system‘(D), data were collected by Cross-checking of a sample of project participants’ sample (Questionnaire, operation surveys/interviews). The verification team has checked and found that for all the parameters the confidence/precision of 95/10 was met. The sampling plan implemented by the CME is in accordance with the applied approved monitoring methodology /B02/ and the PoA-DD/ VPAs /B04/. The CME has appropriately performed stratified random sampling procedure in line with the applied methodology and best suited for this type of project. As the PoA /B04/ mentions the option for Stratified Random Sampling procedure, it is acceptable to the verification team. The necessary confidence / precision of 95/10 each of the parameters is met. This has been cross verified by the verification team from the supporting documents submitted /2/. The verification took cognizance of § 346 of CDM VVS for PoAs, Version 03.0 /B01/and § 17.4 of GS4GG VVS /B08-c/.

E.3.4. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	Document Review, Interview

Findings	No finding raised.
Conclusion	There is no equipment to be calibrated. There are no category II systems which has a pump installed in the VPAs VPA2, VPA3, VPA4, VPA5, VPA6 and VPA7. Hence not applicable.

E.3.5. Assessment of data and calculation of emission reductions or net removals

In line with the requirement of §356 and §357 of CDM VVS for PoAs, Version 03.0 /B01/ and § 17.4 of GS4GG VVS /B08-c/, the verification team has reviewed the Monitoring report /01-d/ and ER spread sheets /02/ to check the arithmetic calculation of the emission reductions. The equation used for the calculation is compared with those provided in the VPAs /B04/ and the methodology AMS-I.C, Version 19 /B02/.

E.3.5.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	Document Review, Interview
Findings	No finding raised.
Conclusion	The equations for baseline emissions, as provided in the Monitoring report /1/ and confirmed with the VPAs /B04/ and the methodology AMS-I.C, Version 19 /B02/, are: SDG 13: Climate Action, The baseline scenario for a VPA is that electricity is imported from the grid for water heating by consumers. To this formula (3) in the methodology AMS-I.C, version 19 applies, which states that: $BE_{thermal,CO2,y} = \sum_{n=1}^{n=N} \frac{EG_{thermal,n,y}}{\eta_{EWH}} X\ EF_{CO2,grid,y}$ (1) Where, $BE_{thermal,\ CO2,y}$ — The baseline emissions from steam/heat displaced by the project activity during the year y — (tCO_2e/year) $EG_{thermal,y}$ — The net quantity of steam/heat supplied by the project activity during the year y — (GJ/year) η_{EWH} — The efficiency of the plant using fossil fuel that would have been used in the absence of the project activity — - **Determination of Baseline Emission Factor Estimation ($EF_{CO2,grid,y}$)** The baseline emission factor estimation is based on Methodological Tool ("Tool to calculate emission factor for electricity systems" (Version 07).Based on the registered VPAs for VPA2 to VPA7, the latest emission grid factor is used to calculate the emission reductions for the monitoring period. The emission factor is derived from the latest version as given by the CEA. Calculations for $EG_{thermal}$ For the calculation of the baseline emissions, the same approach has been used for both Category I and Category II systems. The baseline emissions are calculated using Method 2 from section E.6.2. of the PoA-DD. Formula 3 of the PoA-DD is therefore applied to both Category I and Category II systems $EG_{thermal,n,y,catI} = \frac{V_{catI,n} \times Q_n \times D}{100}$

$$EG_{thermal,n,y,catII} = \frac{V_{catII,n} \times Q_n \times D}{100}$$

Where,

Symbol	Description	Value		Unit
$V_{catI,n}$	Amount of water heated daily in the VPA by Category I system n	VPA2	FPC – 2,141 ETC – 1,302	m^3/day
		VPA3	FPC – 1,623 ETC – 2,024	
		VPA4	FPC – 1,674 ETC – 1,993	
		VPA5	FPC – 1,164 ETC – 2,583	
		VPA6	FPC – 952 ETC – 3,094	
		VPA7	FPC – 673 ETC – 3,484	
$V_{catII,n}$	Amount of water heated daily in the VPAs VPA2, VPA3, VPA4, VPA5 VPA6 and VPA7) by Category II system n	0[1]		m^3/day
Q_n	Average amount of energy collected by the SWH during a Thermal Performance Test at day-time under standard conditions for 100l water	4.6 for FPC and 3.17 for ETC systems for VPA2, VPA3 and VPA4 4.62 for FPC and 3.98 for ETC systems for VPA5 VPA6 and VPA7		kWh/day/100l
D	Number of operational days in year y	290		days/MP

$$BE_{thermal,CO2,y} = \sum_{n=1}^{n=N} \frac{EG_{thermal,n,y,catI}}{\eta_{EWH}} \times EF_{CO2,grid,n,y} + \sum_{n=1}^{n=N} \frac{EG_{thermal,n,y,catII}}{\eta_{EWH}} \times EF_{CO2,grid,n,y}$$

Where,

Symbol	Description	Value		Unit
$EF_{CO2,grid,n,y}$	The CO_2 emission factor of the grid to which systems is connected	India Grid	**1st Crediting Period: 0.9146**	tCO_2e /MWh

[1]Not considered for ER calculations.

	$EG_{thermal, CAT I,y}$	The net quantity of steam/heat supplied by the project activity from Category I systems during the year y. Combined heat for all units, that are operational (@ 85.44% operational based on sample surveys).	VPA2: 8,539 VPA3: 9,611 VPA4: 9,708 VPA5: 48,373 VPA6: 51,618 VPA7: 24,947 **Total: 152,796**	MWh for the monitoring period
	$EG_{thermal, CAT II,y}$	The net quantity of steam/heat supplied by the project activity from Category II systems during the year y[2]	VPA2: 0 VPA3: 0 VPA4: 0 VPA5: 0 VPA6: 0 VPA7: 0 **Total: 0**	MWh for the monitoring period
	η_{EWH}	The efficiency of an electric water heater	100%	
	$BE_{thermal, CO2,y}$	The baseline emissions from steam/heat displaced by the project activity during the year y (@ 73.43% confirmed to be operational based on sample surveys)	VPA2: 7,810 VPA3: 8,791 VPA4: 8,879 VPA5: 44,241 VPA6: 47,210 VPA7: 22,816 **Total: 139,747**	tCO_2e for the monitoring period

[2]Not considered for ER calculations

From the above equation and the parameter values, emission reductions are calculated as:

Specific-case VPA reference number	Emission Reductions (tCO_2e)
VPA - 02 - GS 4613	7,810
VPA - 03 - GS 4614	8,791
VPA - 04 - GS 4615	8,879
VPA - 05 – GS6139	44,241
VPA - 06 – GS6356	47,210
VPA - 07 – GS7602	22,816
Total	**139,747**

The verification team confirms that the calculation of baseline emission and emission reductions is in accordance with the applied methodological equation and the VPAs. Calculations have been checked and confirmed from the ER spread sheet /02/.

The verification took cognizance of § 356 of CDM VVS for PoAs, version 03.0 /B01/ and § 17.4 (g) of GS4GG VVS /B08-c/.

E.3.5.2. Calculation of project GHG emissions or actual net GHG removals by sinks

Means of verification	Document Review, Interview
Findings	CAR 05 was raised and closed satisfactorily. Kindly refer appendix 4 for further details.
Conclusion	The project emissions are calculated as follows: $$PE_{EC,y,n,II} = \sum_{n=1}^{N} EC_{PJ,n,y} \times EF_{CO2,grid,n,y} \times (1 + TDL_y)$$ Where,

Symbol	Description	Value	Unit
$PE_{EC,y,n,II}$	Project emissions from electricity consumption by category II system n from the grid during the year *y*[3]	0	tCO_2e/year
$EF_{CO2,grid,y,n}$	The CO_2 emission factor of the grid to which systems is connected	1st Crediting Period: 0.9029 for VPA2-7	tCO_2e /MWh
$EC_{PJ,n,y}$	Quantity of electricity consumed by the Category II system n in year *y*	0	MWh/year
TDL_y	Average technical transmission and distribution losses for providing electricity to the category II system	20	%

Since there are no pumps in any of the VPAs – VPA2, VPA3, VPA4, VPA5, VPA6 and VPA7, the project emission is also not accounted for this monitoring period.

There are no project emissions identified in the monitoring methodology /B02/ and the VPAs /B04/ and § 17.4 (g) of GS4GG VVS /B08-c/.

[3] There is only one system with a pump, located in Karnataka; hence the emission factor of the Southern grid applies.

E.3.5.3. Calculation of leakage GHG emissions

E.3.5.4. Summary of calculation of GHG emission reductions or net GHG removals by sinks

Means of verification	Document Review, Interview
Findings	No finding raised.
Conclusion	Emission reductions are calculated as the difference between the baseline emission from displaced electricity and the sum of the project emissions (PEy) and leakage (LEy). ERy= BEy - (PEy + LEy) Where, **Symbol** / **Description** / **Unit** ER_y / Emission reductions by the project activity during a given year *y* / tCO_2e/year BE_y / Baseline emissions of the project activity during the year *y* / tCO_2e/year PE_y / Project emissions of the project activity during the year y / tCO_2e/year LE_y / Leakage emissions in the year *y* / tCO_2e/year The verification team confirms that all parameters are used correctly in the calculations, all results are verifiable and transparent, all assumptions are described and based on verifiable evidence and calculations are done in accordance with the pre-defined formulae from VPAs. The total number of ERs achieved during the monitoring period is 139,747 tCO_2e. In summary, verification team confirms that actual emission reduction is lower than the estimate of the VPAs /B04/ for the current monitoring period. The verification took cognizance of § 356 of CDM VVS PoAs, version 03 /B01/ and § 17.4 (g) of GS4GG VVS /B08-c/.

Title and UNFCCC reference number of the VPA	Baseline emissions or baseline net GHG removals by sinks (tCO_2e)	Project emissions or actual net GHG removals by sinks (tCO_2e)	Leakage (tCO_2e)	GHG emission reductions or net GHG removals by sinks (tCO_2e)		
				Amount achieved before 1 January 2013	Amount achieved from 1 January 2013	Amount achieved in the entire monitoring period
VPA - 02 - GS 4613	7,810	0	0	0	7,810	7,810
VPA - 03 - GS 4614	8,791	0	0	0	8,791	8,791
VPA - 04 - GS 4615	8,879	0	0	0	8,879	8,879
VPA - 05 – GS6139	44,241	0	0	0	44,241	44,241
VPA - 06 – GS6356	47,210	0	0	0	47,210	47,210
VPA - 07 – GS7602	22,816	0	0	0	22,816	22,816
Total	**139,747**	**0**	**0**	**0**	**139,747**	**139,747**

E.3.5.5. Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included VPA

Means of verification	Document Review
Findings	No finding raised.
Conclusion	Comparison of the actual GHG emission reductions with the estimates in the included specific VPAs is given in the below table. The verification team took cognizance of § 356 of CDM VVS for PoAs, version 03 /B01/ and § 17.4 of GS4GG VVS /B08-c/.

Title and UNFCCC reference number of the VPA	Actual values achieved by the VPAs during this monitoring period (tCO_2)	Value estimated in ex ante calculation in the included VPA-DD(s) (tCO_2)
VPA - 02 - GS 4613	7,810	47,441
VPA - 03 - GS 4614	8,791	10,623
VPA - 04 - GS 4615	8,879	10,542
VPA - 05 – GS6139	44,241	50,426
VPA - 06 – GS6356	47,210	52,769
VPA - 07 – GS7602	22,816	54,812
Total	**139,747**	**226,613**

E.3.5.6. Remarks on difference from estimated value in included VPA

Means of verification	Document review
Findings	No Finding raised.
Conclusion	The actual emission reductions are less than the ex-ante estimated values in the VPA-DDs. Please check the table above.

E.3.6. Assessment of reported sustainable development co-benefits

Means of verification	Document Review, Interview
Findings	CAR 04 was raised and closed satisfactorily. Kindly refer appendix 4 for further details.
Conclusion	Verification team confirms that the data and parameters monitored related to sustainable development co-benefits are in compliance with the VPAs and the monitoring plan /B04/. A complete assessment of each of the monitored parameters has been provided in Appendix 6 and 7 of the verification report.

SDG	SDG Impact	Baseline estimate	Project estimate	Net Benefit	VVB Assessment
13	i. GHGs emissions reduction per year ii. Improve education, awareness-raising and human and institutional capacity on	VPA / tCO_2/MP VPA 2 / 7,810 VPA 3 / 8,791 VPA 4 / 8,879 VPA 5 / 44,241 VPA6 / 47,210 VAP7 / 22,816 Total / 139,747	i.0 in the monitoring period for VPA2-VPA7. VPA / tCO_2/MP: VPA2 0; VPA3 0; VPA4 0; VPA5 0; VPA6 0; VAP7 0; Total 0 ii. Conduct of 2 educational and awareness raising capacity building	i. 139,747 tCO_2 reductions in the monitoring period for VPA2-VPA7. VPA / tCO_2/MP: VPA2 7,810; VPA3 8,791; VPA4 8,879; VPA5 44,241; VPA6 47,210; VAP7 22,816; Total 139,747 ii. Conduct of 2 educational and awareness raising capacity building programs for college	VVB has reviewed the ER sheet /02/, database/03/,monitoring survey /06/ and same has been cross checked during onsite visit /15/. VVB has assessed the SDG impact and found appropriate.

<table>
<tr><td></td><td></td><td>climate change mitigation</td><td>i. 139,747 tCO_2 in the baseline scenario from use of electricity from the grid and
ii. No awareness programs</td><td>programs for college students in association with Rotary Green Brigade.

This is for all VPAs put together</td><td>students in association with Rotary Green Brigade.
This is for all the VPAs put together.</td><td></td></tr>
<tr><td></td><td>3</td><td>i.Number of SWHs installed
ii.MWh of grid electricity avoided leading to avoidance of SO_2 and NO
iii. Number of deaths avoided</td><td>i. No SWHs installed
ii. No grid electricity avoided
iii. No avoidance of non-GHG emissions of tSO_2 and tNO leading to 17 deaths.</td><td>Implementation of 106,521 SWH units for VPA2-VPA7 that has reduced use of 152,796 MWh of grid electricity leading to the avoidance of 1553 tSO_2 and 431 tNO and avoidance of 17 deaths during the monitoring period.
<table>
<tr><th>VPAs</th><th>Number of SWHs</th><th>MWh saved</th></tr>
<tr><td>2</td><td>14,562</td><td>29,969</td></tr>
<tr><td>3</td><td>18,357</td><td>29,763</td></tr>
<tr><td>4</td><td>16,953</td><td>30,061</td></tr>
<tr><td>5</td><td>17,166</td><td>33,580</td></tr>
<tr><td>6</td><td>19,386</td><td>35,833</td></tr>
<tr><td>7</td><td>20,097</td><td>20,347</td></tr>
<tr><td>Total</td><td>106,521</td><td>152,796</td></tr>
</table></td><td>Implementation of 106,521 SWH units for VPA2-VPA7 that has reduced use of 152,796 MWh of grid electricity leading to The avoidance of 1575 tSO2 and 437 tNO and avoidance of 17 deaths during the monitoring period.
<table>
<tr><th>VPAs</th><th>SO2 ERs (t SO_2)</th><th>No. ERs (t NO)</th><th>No. of deaths avoided</th></tr>
<tr><td>2</td><td>74</td><td>20</td><td>1</td></tr>
<tr><td>3</td><td>83</td><td>23</td><td>1</td></tr>
<tr><td>4</td><td>84</td><td>23</td><td>1</td></tr>
<tr><td>5</td><td>418</td><td>116</td><td>5</td></tr>
<tr><td>6</td><td>446</td><td>124</td><td>6</td></tr>
<tr><td>7</td><td>216</td><td>60</td><td>3</td></tr>
<tr><td>Total</td><td>1,322</td><td>367</td><td>17</td></tr>
</table>
<table>
<tr><th>VPAs</th><th>Number of SWHs</th><th>MWh saved</th></tr>
<tr><td>2</td><td>14,562</td><td>8,539</td></tr>
<tr><td>3</td><td>18,357</td><td>9,611</td></tr>
<tr><td>4</td><td>16,953</td><td>9,708</td></tr>
<tr><td>5</td><td>17,166</td><td>48,373</td></tr>
<tr><td>6</td><td>19,386</td><td>51,618</td></tr>
<tr><td>7</td><td>20,097</td><td>24,947</td></tr>
<tr><td>Total</td><td>106,521</td><td>152,796</td></tr>
</table></td><td>VVB has reviewed the ER sheet /02/, database/03/,monitoring survey /06/ and same has been cross checked during onsite visit /15/. VVB has assessed the SDG impact and found appropriate.</td></tr>
<tr><td></td><td>4</td><td>i. Number of technical and support employment jobs created
ii.Number of trainings, workshops conduct</td><td>Absence of employees, training programs and certification</td><td>Created 128 jobs of which 48 are technical and 80 support staff and conduct of 11 training programs.

This is for all the VPAs put together</td><td>Created 128 jobs of which 48 are technical and 80 support staff and conduct of 11 training programs.

This is for all the VPAs put together</td><td>VVB has reviewed the ER sheet /02/, database/03/, training records /08/ and same has been cross checked during onsite visit /15/. VVB has assessed the SDG impact and found appropriate.</td></tr>
</table>

<table>
<tr><td></td><td></td><td>ed for employees.</td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>7</td><td>i.Number of SHWs installed
ii.Change in Energy Use
iii.Number of SWHs that have been provided with after sales services to end-users
iv. Reduction of electricity charges due to use of SWHs on average per user.</td><td>No SWHs installed leading to use of grid electricity and use of it for heating water</td><td>Installation of 106,521 SWHs, reduction of use of 152,796 MWh grid electricity;
<table><tr><th>VPA</th><th>No. of SWHs</th><th>MWh saved</th></tr><tr><td>2</td><td>14,562</td><td>8,539</td></tr><tr><td>3</td><td>18,357</td><td>9,611</td></tr><tr><td>4</td><td>16,953</td><td>9,708</td></tr><tr><td>5</td><td>17,166</td><td>48,373</td></tr><tr><td>6</td><td>19,386</td><td>51,618</td></tr><tr><td>7</td><td>20,097</td><td>24,947</td></tr><tr><td>T</td><td>106,521</td><td>152,796</td></tr></table>3,206 SWHs provided with after sales services and reduction of about Rs. 958.55 million due to avoidance of use of grid electricity by end users.
This is for all the VPAs put together</td><td>Installation of 106,521 SWHs, reduction of use of 152,796 MWh grid electricity;
<table><tr><th>VPA</th><th>No. of SWHs</th><th>MWh saved</th></tr><tr><td>VPA 2</td><td>14,562</td><td>29,969</td></tr><tr><td>VPA 3</td><td>18,357</td><td>29,763</td></tr><tr><td>VPA 4</td><td>16,953</td><td>30,061</td></tr><tr><td>VPA 5</td><td>17,166</td><td>33,580</td></tr><tr><td>VPA 6</td><td>19,386</td><td>35,833</td></tr><tr><td>VPA 7</td><td>20,097</td><td>20,347</td></tr><tr><td>Total</td><td>106,521</td><td>152,796</td></tr></table>3,206 SWHs provided with after sales services and reduction of about Rs. 958.55 million due to avoidance of use of grid electricity by end users.
This is for all the VPAs put together</td><td>VVB has reviewed the ER sheet /02/, database/03/,monitoring survey /06/ and same has been cross checked during onsite visit /15/. VVB has assessed the SDG impact and found appropriate.</td></tr>
<tr><td></td><td>8</td><td>i.Total number of paid employees (full-time and part-time)
ii.Total number of temporary employees
iii.Number of paid employees engaged in after-sales service
iv.Continued certifica</td><td>None of the project activity</td><td>Paid 128 employees with 10 sales employees engaged in after-sales services and certification of Nuetech Solar Systems Pvt. Ltd. for Quality Management Systems, i.e. ISO 9001:2015.
There is no discrimination of pay for men and women in the company
This is for all the VPAs put together</td><td>Paid 128 employees with 10 sales employees engaged in after-sales services and certification of Nuetech Solar Systems Pvt. Ltd. for Quality Management Systems, i.e. ISO 9001:2015.
There is no discrimination of pay for men and women in the company
This is for all the VPAs put together</td><td>VVB has reviewed the ER sheet /02/, database/03/,employment records /07/ and same has been cross checked during onsite visit /15/. VVB has assessed the SDG impact and found appropriate.</td></tr>
</table>

	tion under ISO 9001:2015 v.Equal pay for work for equal value for both men and women				
9	i. Research and development (R&D) expenditures	No budget for R&D	Rs.3.14 million spent on R&D towards salaries and expenses towards R&D personnel and equipment towards research and development. This is for all the VPAs put together	Rs.3.14 million spent on R&D towards salaries and expenses towards R&D personnel and equipment towards research and development. This is for all the VPAs put together	VVB has reviewed the ER sheet /02/, database/03/,monitoring survey /06/, SDG contribution documents /16/ and same has been cross checked during onsite visit /15/. VVB has assessed the SDG impact and found appropriate.
17	i.Balance of payments and investment	No investments	Rs. 7.61 million was invested during the monitoring period. This is for all the VPAs put together	Rs. 7.61 million was invested during the monitoring period. This is for all the VPAs put together	VVB has reviewed the ER sheet /02/, database/03/,monitoring survey /06/ along with SDG contribution documents /16/ and same has been cross checked during onsite visit /15/. VVB has assessed the SDG impact and found appropriate.

The verification took cognizance of § 344, § 345(c), §356 and §357 of CDM VVS for PoAs, Version 03.0 /B01/ and § 17.4 of GS4GG VVS /B08-c/.

SECTION F. Internal quality control

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The final verification report passed a technical review. A technical reviewer qualified in accordance with the CCIPL's qualification scheme for CDM validation and verification has performed the technical review.

SECTION G. Verification opinion

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Carbon Check (India) Private Ltd. has performed the eighth verification for the GS Programme of Activities "Solar Water Heater Program in India" in India (hereafter referred to as "Programme of Activities or PoA"), for the VPAs titled "Solar Water Heater Program in India – VPA-02"; " Solar Water Heater Program in India – VPA No 03''; "Solar Water Heater Program in India – VPA-04"; "Solar

Water Heater Program in India – VPA-05"; "Solar Water Heater Program in India – VPA-06"; "Solar Water Heater Program in India – VPA-07";

The verification team assigned by the VVB concludes that the PoA (Version 07, dated 29/08/2016), VPA-02 (Version 7, dated 17/10/2019), VPA-03 (Version 7, dated 17/10/2019), VPA-04 (Version 6, dated 25/09/2019), VPA-05 (Version 4, dated 25/09/2019), VPA-06 (Version 4, dated 25/09/2019), and VPA-07 (Version 3.1, dated 26/10/2020), as described in the VPA-DDs /B04/, Approved GS4GG Transition Document: dated 11/06/2018 and the Monitoring report (Version 04, dated 01/02/2023) /01-d/, meet all relevant GS4GG requirements /B08/ and requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol and paragraph 62 of CDM M& P, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board. The verification has been conducted in-line with the CDM VVS for programme of activities requirements version 03.0 /B01/.

Verification methodology and process:

The Verification team confirms the contractual relationship /14/ signed on 02/06/2023 between the VVB, Carbon Check (India) Private Ltd. and the Co-ordinating Managing Entity/ Project Participant, (Nuetech Solar Systems Pvt. Ltd.). The team assigned to the verification meets the Carbon Check (India) Private Ltd.'s internal procedures including the UNFCCC and GS requirements for the team composition and competence. The verification team has conducted a thorough contract review as per UNFCCC and Carbon Check's procedures and requirements.

The verification is being performed as per the requirements described in the CDM VVS for PoAs, version 03.0 /B01/ and GS4GG requirements and constitutes the review and completion of the following steps:

- Reviewing the PoA (Version 07, date 29/08/2016), the VPA-02 (Version 7, dated 17/10/2019), VPA-03 (Version 7, dated 17/10/2019), VPA-04 (Version 6, dated 25/09/2019), VPA-05 (Version 4, dated 25/09/2019), VPA-06 (Version 4, dated 25/09/2019), and VPA-07 (Version 3.1, dated 26/10/2020)/B04/, including the monitoring plan and the corresponding validation report/s /B04/;
- Previous CDM verification and certification reports and the monitoring reports for the previous monitoring periods /B08/;
- Desk review of the validation report, MR and other relevant documents including documents related to the project activities in emission reductions;
- Review of the applied monitoring methodology (AMS-I.C, version 19);
- Review of any CMP and EB decisions, clarifications and guidance;
- On-site interviews (24/07/2023 to 25/07/2023 and 27/07/2023 to 28/07/2023)
- Resolution of CARs and CLs raised during verification;
- Issuance of Verification Report

The Voluntary project activities were correctly implemented according to the selected monitoring methodology, monitoring plan and the VPAs. The monitoring system was installed, maintained in a proper manner, while collected monitoring data allowed for the verification of the amount of achieved GHG emission reductions. Through the review and on-site interviews, the verification team confirms that the PoA has resulted in the 139,747 tCO_2e emission reductions during the eighth monitoring period of first crediting period for VPA No 02 to VPA No 07.

Verified emission reductions:

Specific-case VPA reference number	Emission Reductions (tCO_2e)
VPA - 02 - GS 4613	7,810
VPA - 03 - GS 4614	8,791
VPA - 04 - GS 4615	8,879

VPA - 05 – GS6139	44,241
VPA - 06 – GS6356	47,210
VPA - 07 – GS7602	22,816
Total	**139,747**

CCIPL as a VVB is therefore pleased to issue a positive verification opinion in the Certification statement.

SECTION H. Certification statement

>>

Carbon Check (India) Private Ltd., the VVB, has performed the verification of the GS Programme of Activities, GS 3378, “Solar Water Heater Program in India” in India. The PoA involves installation of Solar Water Heaters (SWHs) in residential as well as commercial buildings throughout India. The programme saves electricity generated from fossil fuel by using renewable energy to meet hot water requirements, resulting in lower CO_2 emissions. The SWHs installed under VPAs of the PoA, are intended to reduce emissions by replacing fossil fuel-generated electricity with renewable energy to meet hot water demand for various applications.

The Voluntary project activities of the Programme of Activities are designed to generate emission reductions by installation of SWHs in various states of India. The CME and VPA implementer are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the Voluntary project activity/ies. It is VVB’s responsibility to express an independent verification statement on the reported GHG emission reductions from the Voluntary project/s. The VVB does not express any opinion on the selected baseline scenario or on the validated and registered PoA-DD/VPA-DDs. The verification is carried out in-line with the CDM VVS and GS4GG requirements.

The verification was performed to identify the compliance of the Voluntary project/ies with implementation and monitoring requirements, and to verify the actual amount of achieved emission reductions, through obtaining evidence and on-site interviews that included i) checking whether the provisions of the monitoring methodology and the monitoring plan were consistently and appropriately applied and ii) the collection of evidence supporting the reported data.

The verification is based on:

- PoA, Version 07 dated 29/08/2016;
- VPAs included in the PoA and its monitoring plan for the monitoring period 01/01/2022 – 31/03/2023.
- Approved CDM monitoring methodology AMS-I.C “Thermal energy production with or without electricity”, Version 19;
- Validation report /B04/ for the PoA and the VPA/s;
- Monitoring report Version 04 dated 01/12/2023

This statement covers verification period from 01/01/2022 – 31/03/2023 (both dates included).

The VVB had raised three (03) clarification requests and five (05) corrective action request which need to be resolved by the CME.

The VVB considers necessary to give reasonable assurance that reported GHG emission reductions were calculated correctly on the basis of the monitoring methodology and the monitoring plan contained in the VPAs are fairly stated.

The VVB, hereby certifies that the project activity, achieved emission reductions by sources of GHG equal to 139,747 tCO_2e from 01/01/2022 to 31/03/2023 (both dates included) and all monitoring requirements have been fulfilled and is substantiated by an audit trail that contains evidence and records.

Appendix 1. Abbreviations

Abbreviations	Full texts
CDM	Clean Development Mechanism
CAR	Corrective Action Request
CCIPL	Carbon Check (India) Private Ltd.
CER	Certified Emission Reduction
CL	Clarification Request
CME	Co-ordinating and Managing entity
VPA	Voluntary Project Activity
VPA-DD	Voluntary Project Activity Design Document
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
DR	Document review
EB	CDM Executive Board
EF	Emission Factor
EI	External individual
ETC	Evacuated Tube Collector
FA	Final Approval
FAR	Forward Action Request
FPC	Flat Plate Collector
FVR	Final verification Report
GHG	Greenhouse gas(es)
GS4GG	Gold Standard for the Global Goals
GWh	Giga Watt Hour
I	Interview
IR	Internal resource
MP	Monitoring Period
MWh	Mega Watt Hour
MR	Monitoring Report
PoA	Programme of Activities
PoA-DD	Programme of Activities Design Document
PP	Project Participant
QC/QA	Quality control /Quality assurance
SDG	Sustainable Development Goal
SWHs	Solar Water Heaters
TA	Technical Area
TR	Technical Review
TRF	Transition Request Form
UNFCCC	United Nations Framework Convention on Climate Change
UQL	Unacceptable Quality Limit
VER	Verified Emission Reduction
VVS	Validation and Verification Standard
VVB	Validation & Verification Body

Appendix 2. Competence of team members and technical reviewers

Carbon CHECK

Carbon Check (India) Private Limited

Certificate of Competency

Mr. Rishi Raychoudhury

has been qualified as per CCIPL's internal qualification procedures in accordance with the requirements of CDM AS (V7.0), ISO/IEC14065:2020, ISO/IEC 17029:2019 and other applicable GHG programs:

for the following functions and requirements:

☒ Validator	☒ Verifier	☒ Team Leader	☒ Technical Expert
☐ Technical Reviewer	☐ Health Expert	☐ Gender Expert	☐ Plastic Waste Expert
☒ SDG+	☒ Social no-harm(S+)	☒ Environment no-harm(E+)	☐ CCB Expert
☐ Financial Expert	☒ Local Expert for India		

in the following Technical Areas:

☐ TA 1.1	☒ TA 1.2	☐ TA 2.1	☒ TA 3.1	☐ TA 4.1
☐ TA 4. n	☐ TA 5.1	☐ TA 5.2	☐ TA 7.1	☐ TA 8.1
☐ TA 9.1	☐ TA 9.2	☐ TA 10.1	☐ TA 13.1	☐ TA 13.2
☐ TA 14.1	☐ TA 15.1			

Issue Date
1st January 2023

Expiry Date
31st December 2023

Mr. Vikash Kumar Singh
Compliance Officer

Mr. Amit Anand
CEO

CCIPL_FM 7.9 Certificate of Competency_V2.1_012023

Carbon CHECK

Carbon Check (India) Private Limited

Certificate of Competency

Mr. Shivaji Chakraborty

has been qualified as per CCIPL's internal qualification procedures in accordance with the requirements of CDM AS (V7.0), ISO/IEC14065:2020, ISO/IEC 17029:2019 and other applicable GHG programs:

for the following functions and requirements:

☐ Validator	☐ Verifier	☐ Team Leader	☒ Technical Expert
☒ Technical Reviewer	☐ Health Expert	☐ Gender Expert	☐ Plastic Waste Expert
☒ SDG+	☒ Social no-harm(S+)	☒ Environment no-harm(E+)	☐ CCB Expert
☒ Financial Expert	☒ Local Expert for India		

in the following Technical Areas:

☒ TA 1.1	☒ TA 1.2	☐ TA 2.1	☒ TA 3.1	☐ TA 4.1
☐ TA 4. n	☐ TA 5.1	☐ TA 5.2	☐ TA 7.1	☐ TA 8.1
☐ TA 9.1	☐ TA 9.2	☐ TA 10.1	☐ TA 13.1	☐ TA 13.2
☐ TA 14.1	☐ TA 15.1			

Issue Date

1st January 2023

Expiry Date

31st December 2023

Mr. Vikash Kumar Singh
Compliance Officer

Mr. Amit Anand
CEO

CCIPL_FM 7.9 Certificate of Competency_V2.1_012023

Appendix 3. Documents reviewed or referenced

Sl. No.	Document
/1/	a) Monitoring report for VPA 02 to VPA 07 (CP-1) version 01, dated; 07/06/2023 b) Monitoring report for VPA 02 to VPA 07 (CP-1) version 02, dated; 15/10/2023 c) Monitoring report for VPA 02 to VPA 07 (CP-1) version 03, dated; 02/11/2023 d) Monitoring report for VPA 02 to VPA 07 (CP-1) version 04, dated; 01/12/2023
/2/	Emission reduction calculation spread sheets for the VPA 02 to VPA 07 correspond to /01/ : a) VPA2-2022-CP1-V1 b) VPA3-2022-CP1-V1 c) VPA4-2022-CP1-V1 d) VPA5-2022-CP1-V1 e) VPA6-2022-CP1-V1 f) VPA7-2022-CP1-V1
/3/	SWH distribution / sales records for the VPA 02 to VPA 07 of the PoA titled “SolarWater Heater Programme in India” (2015-2022)
/4/	Evidence for unique identification of each of the SWH
/5/	Sample size and precision level achieved calculator for the monitoring period
/6/	Monitoring Survey database including duly filled sample forms (2022-2023)
/7/	Employment Records
/8/	Training Records
/9/	Thermal performance test report for ETC SWHs
/10/	Thermal performance test report for FPC SWHs
/11/	Proof of Carbon Credits waiver by End user / VER right agreement
/12/	Previous MP verification report
/13/	Registered PoA-DD/VPA-DDs
/14/	Contract (CCIPL & Nuetech) (02/06/2023)
/15/	OSV Records
/16/	SDG Contribution
/17/	Evidence of randomness of the sample taken by the CME for survey/other samplings
/18/	Grid Emission Factor calculation sheet (v18.0, September 2022)
/19/	Technical specifications for SWH types distributed in the VPA of the PoA

Background Documents

No.	Author	Title	References to the document	Provider
/B01/	UNFCCC	1. Validation and Verification Standard for PoAs, version 03 2. Project Standard for PoAs, version 03	http://cdm.unfccc.int/	Publicly Available
/B02/	UNFCCC	Applied baseline and monitoring methodology, “AMS-I.C, version 19 “Thermal energy production with or without electricity”	http://cdm.unfccc.int/	Publicly Available
/B03/	GS4GG	1. Template Monitoring Report, version 1.1 2. Template guide Monitoring Report, version 1.1	www.goldstandard.org	Publicly Available
/B04/	GS4GG	Registered GS PoA-DD and VPA-DDs and corresponding Validation Reports	www.goldstandard.org	Publicly Available
/B05/	Web sites	Websites: http://cdm.unfccc.int/ http://www.ipcc-nggip.iges.or.jp/ http://www.pciaonline.org/testing http://circodu.org.ug/		Publicly Available
/B06/	UNFCCC	Guidelines: Sampling and surveys for CDM project activities and programmes of activities (version 04.0)	http://cdm.unfccc.int/	Publicly Available

/B07/	UNFCCC	Standard: Standard for sampling and surveys for CDM project activities and Programme of Activities (version 09.0)	http://cdm.unfccc.int/	Publicly Available
/B08/	GS4GG	a) GS4GG "Principles & Requirements", version 1.2 b) GS4GG "Programme of Activity Requirements", version 1.2 c) GS4GG "Validation and Verification standard", version 1.0	www.goldstandard.org	Publicly Available
/B09/	UNFCCC	Guideline: Application of materiality in verifications, Version 02.0	http://cdm.unfccc.int/	Publicly Available

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

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

No FAR from previous verification

Table 2. CLs from this verification

CL ID	01	**Section no.**	E.3.3.2	**Date:** 04/10/2023
Description of CL				
CME is requested to provide the following supporting documents: ***a)*** *Survey forms applicable for this Monitoring Period.* ***b)*** *Employment generation records with justification of fair pay.* ***c)*** *Grievance register for this monitoring period.* ***d)*** *Training and awareness generation records.* ***e)*** *Monitoring Logbook.*				
Project participant response				**Date:** 16/10/2023
The following documents are provided: ***a)*** *Survey forms applicable for this Monitoring Period.* ***b)*** *Employment generation records with justification of fair pay.* ***c)*** *Grievance register for this monitoring period is the customer service records* ***d)*** *Training and awareness generation records.*				
Documentation provided by project participant				
As mentioned above				
VVB assessment				**Date:** 23/10/2023
a) *CME has submitted the Survey Forms for this MP which is acceptable as credible evidence. Hence, CL point is closed.* ***b)*** *CME has submitted Excel sheet for Employment generation records of 132 people and salary slip of 121 person which is not acceptable as credible evidence. CME is requested to provide credible evidence for the same. Hence, CL point is open.* ***c)*** *CME has provided training program attendance sheets for 11 training programs which is acceptable as credible evidence. Moreover, CME has requested to provide evidence for educational awareness trainings under SDG 13. Hence, CL point is open.* ***d)*** *CME has not provided evidence for grievance and monitoring logbook. CME is requested to provide the same. Hence, CL point is open.* *Also,* *CME is requested to provide credible evidence for SDG contribution of all VPAs for SDG 7(sales record), 8 (ISO document), 9 and 17. Hence, CL is open.*				
Project participant response				**Date:** 02/11/2023
b) The employment salary slips are also provided for a few employees. Also, the attendance sheet of March 2023 is enclosed for evidence. *c) The evidence of educational awareness trainings under SDG 13 is enclosed* *d) The grievance is with regard to repair and maintenance which is included in the GS SDGs calculations-V1 Excel sheet. This is from the CRM online database. All grievances from end users are entered to the CRM database with date of the grievance and closure of the issue. These are intimated by the end users through phone to the customer care department.* *e) The ISO certification is enclosed. The sales records are already included in the ER Calculations sheet for each of the VPA. The R and D and total investments are submitted for the monitoring period.*				
Documentation provided by project participant				

Salary slips and attendance sheet.
The evidence of educational awareness trainings conducted
The ISO certificate for the monitoring period
The audit statement

VVB assessment	**Date:** 08/11/2023

a) *CME has provided salary slip and attendance sheet of March 2023 for 122 employees. Hence, CL point is closed.*

b) *CME has provided attendance sheet of educational training. Hence, CL point is closed.*

c) *CME has provided evidence for grievance and included monitoring procedure in section C(b) of the MR. Hence, CL point is closed.*

d) *CME has provided credible evidence for SDG 7, 8, 9 and 17. Hence, CL point is closed.*

Justification provided by CME is acceptable for all CL points. Hence, CL is closed.

CL ID	02	**Section no.**	E.3.3.3	**Date:** 04/10/2023

Description of CL

In section D.4 of the MR, CME states "377 samples (265 in high radiation and 112 in low radiation) with representation in Low Radiation and High Radiation were conducted".

Considering the above observation, CME shall explain the following:

1) *Assumed response rate.*

2) *The basis of selecting 377 households.*

3) *Explain if the number of systems to be surveyed/samples in high and low radiation were proportionally allocated as per the equation 28 provided in the section B.5.2 of the registered VPA-DD.*

Project participant response	**Date:** 16/10/2023

1. *The assumed response rate of 73.43% is applied which is the response rate during the previous Monitoring Period.*
2. *Oversampling was done to cover all the VPAs to determine the operational days and operational units.*
3. *Based on proportional allocation ever after t distribution to determine the sample size, the number of samples is 6 for high and 2 for low radiation. As mentioned oversampling was done for both the high radiation and low radiation regions covering all the VPAs.*

Documentation provided by project participant

Sample size calculator

VVB assessment	**Date:** 27/10/2023

1. *The assumed response rate considered for arriving at the final adjusted sample size is 73.43% and the same is based on the results obtained during previous monitoring survey. The same is acceptable to verification team. Hence, CL point is closed.*

2. *CME applied a response rate of 73.43%,has also applied the student's t-distribution calculation separately for each stratum and the revised sample size calculated for Strata I (high radiation) and Strata II (low radiation) is 6 and 2 respectively. However, the PP has performed oversampling and sampled 265 households in Strata I (high radiation) and 112 households in Strata II (low radiation) i.e., a total of 377 households. The same is acceptable to verification team as the footnote 11 of the sampling standard (v09.0) encourages oversampling. Hence, CL point is closed.*

3. *CME has provided the revised sample size calculation sheet (Meth_guid48Calculator-2023-V1-t calculations-V2.xlsx) and through the review of the same it has been confirmed that the number of systems to be surveyed/samples in high and low radiation were proportionally allocated as per the equation 28 provided in the section B.5.2 of the registered VPA-DD. The same is acceptable to verification team. Hence, CL point is closed.*

Thus, the justification provided by the CME is deemed acceptable. Hence , CL is closed.

CL ID	03	**Section no.**	E.3.3.1	**Date:** 27/10/2023
Description of CL				
CME is requested to provide following documents: *a) VPA distribution records including evidence for the dates of distribution.* *b) Technical specifications for SWH types distributed in the VPA of the PoA.* *c) Proof of Carbon Credits waiver by End user / VER right agreement.* *d) Thermal performance test report for ETC SWHs.* *e) Thermal performance test report for FPC SWHs.* *f) Documentary evidence to substantiate the start date of VPA 02 to VPA 07.* *g) GS issuance review report for the previous verification.* *h) Evidence for unique identification of each of the SWH.*				
Project participant response				**Date:** 02/11/2023
a) the VPA distribution records are provided in the ER Calculations sheet, which has the details of the invoice number, date of invoice and date of installation for those units which is after the start date of the VPAs. The VVB has seen the records during site visit. Also the warranty cards for few of the units are enclosed for reference. *b) the technical specifications of SWHs distributed in the VPA is included in section B.1.* *c) the proof of carbon credits waiver by end user /VER right agreement is included in the invoice of the SWH. Sample copies of invoices are included.* *d) Thermal performance test report for ETC SWHs is enclosed.* *e) Thermal performance test report for FPC SWHs is enclosed* *f) the invoices on start dates of VPA 02 to 07 is submitted* *g) the GS issuance review report for the previous verification is enclosed* *h) The evidence for unique identification of each of the SHW is either the address or the Unit ID. The excel sheet for all the VPAs is submitted.*				
Documentation provided by project participant				
Documents as mentioned above				
VVB assessment				**Date:** 27/10/2023
a) *CME has provided database of SWHs with date of installation and invoice. Hence, CL point is closed.* ***b)*** *CME has included technical specification of SWHs in section B.1 of the MR and provided supporting documents for the same. Hence, CL point is closed.* ***c)*** *CME has provided sample copies of invoices in which carbon waiver details is included. Hence, CL point is closed.* ***d)*** *CME has provided thermal performance test for EPC and FPC SWHs. Hence, CL point is closed.* ***e)*** *CME has submitted invoices for start date for VPA 2 to 7. Hence, CL point is closed.* ***f)*** *CME has provided previous MP GS issuance review report. Hence, CL point is closed.* ***g)*** *CME has submitted SWHs database in which unit ID is mentioned. Hence, CL point is closed.* *Justification provided by PO for the above CL points is acceptable to verification team. Hence, CL is closed.*				

Table 3. CAR from this verification

CAR ID	01	**Section no.**	E.1.1	**Date:** 04/10/2023
Description of CAR				

1) *In MR PoA information CME is requested to provide Name and GS ID of fully validated VPA/VPAS as per the MR template guide.*

2) *In table 1 of the MR, CME is requested to maintain consistency for name of VPAs instead of VPA.*

3) *In SDG 3 of Table 1 of MR, CME is requested to use standard notation for no. of SWH systems and MWh saved.*

4) *CME is requested to rectify the date of claimed carbon credit in section B.1 of the MR in subsection titled "Total GHG emission reduction or net anthropogenic GHG removals by sinks……" along with the no. of VPAs..*

Project participant response	**Date:** 16/10/2023
1) the name, GS ID of the VPAs are included in section A.1 of the revised MR *2) In table 1 of the MR, the VPAs are edited to VPAs* *3) Uniformity in use of standard notation is followed in the revised MR* *4) the date of claimed carbon credits for the VPAs is till the end of the Monitoring Period or till the end of the crediting period, which ever is earlier. Hence for VPA2, the end of crediting period is 31/03/2022, for VPA3 and VPA4, it is 12/04/2022, for the rest of the VPAs of 5,6 and 7, it is till the end of the monitoring period as their crediting period is beyond the monitoring period. Hence the dates mentioned are correct. Further explanation is provided in the table*	
Documentation provided by project participant	
Revised Monitoring Report	
VVB assessment	**Date:** 17/10/2023
1) *CME has made the necessary changes in KPI section of the MR. Hence, CAR point is closed.* ***2)*** *CME has made the necessary changes in the table 1 of the MR. Hence, CAR point is closed.* ***3)*** *CME has used the standard notation for no. SWHs, and MWh saved in table 1 under SDG 3. Hence, CAR point is closed.* ***4)*** *CME has not rectified the date for "Carbon credits claimed for CP1 upto…." in page no. 21 of the MR. Hence, CAR point is open.*	
Project participant response	**Date:** 02/11/2023
4) the date of carbon credit claimed is from the start of the monitoring period, i.e. 1/1/2022 to 31/3/2023 for VPA 5,6 and 7. But VPA 2 and 3 has the end of the crediting period on 31/3/2022 and 12/4/2022. The carbon credits claimed for VPA1 is changed to up to 31/03/2023.	
Documentation provided by project participant	
Revised Monitoring Report	
VVB assessment	**Date:** 08/11/2023
CME has rectified the crediting period of PoA in section B.1 of the MR. Hence, CAR is closed.	

CAR ID	02	**Section no.**	E.1.1	**Date:** 04/10/2023
Description of CAR				
1) *CME is requested to rectify table 1 of the MR and provide Amount achieved for each SDG impact clearly along with Units/products for SDG 4, 7, 8.* ***2)*** *CME is requested to use standard notation of units throughout the MR.* ***3)*** *CME is requested to replace VPAs with VPAs for SDG 13 in table of MR and maintain the consistency throughout the MR.*				
Project participant response				**Date:** 16/10/2023
1) As mentioned in the monitoring report, the SDGs 4,7, and 8, it is reported for all VPAs put together, as they cannot be segregated according to the VPAs. *2) The MR is edited to maintain standard notation of units* *3) the VPAs are replaced with VPAs throughout the document.*				
Documentation provided by project participant				
Revised Monitoring Report				
VVB assessment				**Date:** 17/10/2023

1) *CME has provided combined amount achieved for all VPAs for each SDG impact with units/products for SDG 4, 7 & 8. Hence, CAR point is closed.* ***2)*** *CME has rectified and use appropriate notation for the units, however, for the parameter tSO_2, in section D.4 in table 2 and E.5 of the MR standard notation is not used. Hence, CAR point is open.* ***3)*** *CME has made the necessary changes in MR. Hence, CAR point is closed.*
Project participant response **Date:** 02/11/2023
2) The value is mentioned as tSO_2 and tNO. For better clarity, it is now expanded to tonne of SO_2 and NO
Documentation provided by project participant
Revised Monitoring Report
VVB assessment **Date:** 08/11/2023
CME has made the necessary changes in the MR. Hence, CAR is closed.

CAR ID	03	**Section no.**	E.3.3.2	**Date:** 04/10/2023
Description of CAR				
In section D.1 of the MR, for SDG 13 under parameter $V_{catII,\ n}$, the value mentioned for category II system for VPA 2 and VPA 3 is 36 and 26 FPC respectively. However, as per SWHs database it is found 7 and 6 respectively. CME is requested to maintain the consistency of Category - II system.				
Project participant response				**Date:** 16/10/2023
Kindly refer to B22 of sheet VER Calculations, which clearly shows 36 m^3/day and 26 m^3/day for VPA2 and VPA3 for 7 and 6 number of SWHs respectively. The value of $V_{catII,\ n}$ is in terms of m^3/day and not the number of systems. Hence the value is consistent with the ER calculations sheet.				
Documentation provided by project participant				
VVB assessment				**Date:** 23/10/2023
CME has maintained consistency for Category -II system for VPA 2 and VPA 3. Hence, CAR is closed.				

CAR ID	04	**Section no.**	E.3.6	**Date:** 04/10/2023
Description of CAR				
1) *In section E.4 of the MR, the description about project estimates and net benefit is same for SDG 3, 4, 7, 8, 9 & 17 which is inconsistent. CME is requested to make the section in MR consistent as per MR template filing instruction.* ***2)*** *In table 1 of the MR, SDG impact for 3rd parameter of SDG 4 is not mentioned. CME is requested to include the appropriate SDG indicator for the same.*				
Project participant response				**Date:** 16/10/2023
1) the baseline scenario for the SDGs 3,4,7,8,9 and 17 have no or zero status, while the project scenario is due to the implementation of the project leading to the net benefit. Hence the project estimate and the net benefit is the same for project scenario and net benefit. For these parameters, net benefit = project scenario – baseline scenario. *2) the 3rd parameter is deleted as the ISO Certification is reported under SDG 8 for all the VPAs.*				
Documentation provided by project participant				
VVB assessment				**Date:** 17/10/2023
1) *CME has mentioned that baseline scenario for SDG 3, 4, 7, 8, 9 & 17 is zero status and project estimate is the actual benefit due to all VPAs together. Hence, CAR point is closed.* ***2)*** *CME has removed the 3rd parameters from SDG 4 as it is claimed under SDG 8 combined for all VPAs. Hence, CAR point is closed.*				

CAR ID	05	**Section no.**	E.3.5.2	**Date:** 19/10/2023
Description of CAR				
It is observed to VVB that the grid emission factor mentioned in section E.2 and E.1 of the MR is not consistent. CME is requested to maintain consistency for grid emission factor.				
Project participant response				**Date:** 02/11/2023
The grid emission factor is 0.9146 and is made consistent in section E.1 and E.2. of the revised Monitoring Report				
Documentation provided by project participant				
Revised Monitoring Report				

VVB assessment	Date: 08/11/2023
CME has made grid emission factor consistent in section E.1 and E.2 of the MR. Hence, CAR is closed.	

Table 4. FARs from this verification

No FAR raised in this verification

Appendix 5. Data and parameters fixed ex ante

SDG 13: Climate Change

Parameter	Aggregated amount of water heated daily in each VPA by Category I systems **($V_{catI,n}$)**
Data unit:	m^3/day
Default values used:	

VPAs	FPC	ETC
VPA2	2,141	1,302
VPA3	1,623	2,024
VPA4	1,674	1,993
VPA5	1,164	2,583
VPA6	952	3,094
VPA7	673	3,484

Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Parameter	Aggregated amount of water heated daily in each VPA by Category II systems. ($V_{catII,n}$)
Data unit:	m3/day
Default values used:	The value for FPC is 67 The value for ETC is 0

VPAs	FPC	ETC
VPA2	36	0
VPA3	26	0
VPA4	0	0
VPA5	0	0
VPA6	0	0
VPA7	0	0
Total	**67**	**0**

Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Parameter	Efficiency of an electric water heater system (η_{EWH})
Data unit:	%
Default values used:	100%
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Parameter	Average amount of energy collected by the SWH during a Thermal Performance Test at day-time under standard conditions for 100l water ($Q_{,n}$)
Data unit:	kWh/day/100l
Default values used:	FPC: 4.6 and ETC: 3.17 for VPA2, VPA3 and VPA4, FPC: 4.62 and ETC: 3.98 for VPA5, VPA6 and VPA7
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Parameter	Average technical transmission and distribution losses for providing electricity to the category II system (TDL_y)

Data unit:	%
Default values used:	20%
Purpose of data	Project emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

SDG-3: Good Health and well-being:

Parameter	MWh of grid electricity avoided leading to avoidance of SO_2 and NO
Data unit:	tSO_2 and tNO On average, 10 deaths per 1,000 tons of SO_2, and 9 deaths per 1,000 tons of NOx.
Default values used:	SO_2 emissions of 8.65 g/KWh of grid electricity and 2.4 g/KWh for NO
Purpose of data	To estimate the avoidance of non-GHG emissions contributing to air pollution
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Appendix 6. Data and parameters monitored

SDG 13: Climate Change

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Data / Parameter: (as in monitoring plan of VPA-DD):	- Recording annually the number of systems operating - Estimating the annual hours of operation of an average system **(D)**
Measuring frequency/Time Interval:	Annually
Reporting frequency:	Annually
Reported value:	- 85.44% of the installed capacity of systems operating - 290 days/365 days or 6960 operational hours for the installed systems for the monitoring period January 2022 to March 2023.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	Value obtained from monitoring survey records
Is accuracy of the monitoring equipment as stated in the VPA-DD? If the VPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA
Is the calibration interval in line with the monitoring plan of the VPA-DD? If the VPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with VPA-DDs.
Company performing the calibration (internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, the reported data in MR has been compared with monitoring survey records and the ER sheet /2/.
How were the values in the monitoring report verified?	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the VVB

Data / Parameter: (as in monitoring plan of VPA-DD):	The aggregated amount of thermal energy generated by SWH category II unit in monitoring years 2022-23 (MWh) (***$EG_{thermal, CAT II,y}$***)
Measuring frequency/Time Interval:	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
Reporting frequency:	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
Reported value:	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
Details of monitoring equipment:	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
Is accuracy of the monitoring equipment as stated in the VPA-DD? If the VPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
Is the calibration interval in line with the monitoring plan of the VPA-DD? If the VPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
Company performing the calibration(internal or external calibration):	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
Is (are) calibration(s) valid for the whole reporting period?	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
If applicable, has the reported data been cross-checked with other available data?	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
How were the values in the monitoring report verified?	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the VVB

Data / Parameter: (as in monitoring plan of VPA-DD):	Quantity of electricity consumed by the Category II system in 2022-23 ($EC_{PJ,n,y}$)
Measuring frequency/Time Interval:	Among the installed units of all VPAs, there are no systems with pump.
Reporting frequency:	Among the installed units of all VPAs, there are no systems with pump.
Reported value:	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
Details of monitoring equipment:	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
Is accuracy of the monitoring equipment as stated in the VPA-DD? If the VPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
Is the calibration interval in line with the monitoring plan of the VPA-DD? If the VPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
Company performing the calibration(internal or external calibration):	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
Is (are) calibration(s) valid for the whole reporting period?	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
If applicable, has the reported data been cross-checked with other available data?	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
How were the values in the monitoring report verified?	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	The monitoring has not been taking place. Therefore, the respective unit is excluded from the ER calculation.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Data / Parameter: (as in monitoring plan of VPA-DD):	The CO_2 emission factor of the grid to which system n is connected ($\mathbf{EF_{CO2,grid,n,y}}$)

Measuring frequency/Time Interval:	Latest emission factor during the submission of monitoring report.
Reporting frequency:	Latest emission factor during the submission of monitoring report.
Reported value:	1st Crediting Period: **0.9146**
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	Value Based on latest CO2 Baseline Database for the Indian Power Sector User Guide Version 18.0, September 2022, Government of India Ministry of Power Central Electricity Authority (Calculated)
Is accuracy of the monitoring equipment as stated in the VPA-DD? If the VPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA.
Is the calibration interval in line with the monitoring plan of the VPA-DD? If the VPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with VPA-DD.
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, reported data in MR has been compared with the source provided and the ER sheet /2/
How were the values in the monitoring report verified?	The values in the monitoring report were compared against the values in ER sheet/2/
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA.

SDG 3: GOOD HEALTH AND WELL-BEING

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Data / Parameter: (as in monitoring plan of VPA-DD):	i. Number of SWHs installed ii. MWh of grid electricity avoided leading to avoidance of SO_2 and NO iii. Number of deaths avoided
Measuring frequency/Time Interval:	Annual
Reporting frequency:	Annual
Reported value:	i

<table>
<tr><td></td><td>
<table>
<tr><th>VPAs</th><th>Total Number of Systems Installed</th></tr>
<tr><td>VPA2</td><td>14,562</td></tr>
<tr><td>VPA3</td><td>18,357</td></tr>
<tr><td>VPA4</td><td>16,953</td></tr>
<tr><td>VPA5</td><td>17,166</td></tr>
<tr><td>VPA6</td><td>19,386</td></tr>
<tr><td>VPA7</td><td>20,097</td></tr>
<tr><td>Total</td><td>106,521</td></tr>
</table>
ii.
<table>
<tr><th>VPA2</th><th>VPA3</th><th>VPA4</th><th>VPA5</th><th>VPA6</th><th>VPA7</th><th>Total</th></tr>
<tr><td>8,539</td><td>9,611</td><td>9,708</td><td>48,373</td><td>51,618</td><td>24,947</td><td>152,796</td></tr>
</table>
iii. The avoidance of non-GHG emissions of 1322 tSO_2 and 367 tNO and avoidance of 17 deaths during the monitoring period.
</td></tr>
<tr><td>Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)</td><td>Yes</td></tr>
<tr><td>Details of monitoring equipment:</td><td>Value Based on,
i. Based on SWH invoices (VPA database) and Percent of operational units
ii. MWh of avoided grid electricity that avoids non-GHG emissions of SO_2 and NO.
iii. Cropper et al. 2012 https://media.rff.org/documents/RFF-DP-12-25.pdf</td></tr>
<tr><td>Is accuracy of the monitoring equipment as stated in the VPA-DD? If the VPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?</td><td>NA</td></tr>
<tr><td>Calibration frequency /interval:
Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification</td><td>NA.</td></tr>
<tr><td>Is the calibration interval in line with the monitoring plan of the VPA-DD? If the VPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?</td><td>NA. QA/QC procedures stated in MR comply with VPA-DD.</td></tr>
<tr><td>Company performing the calibration(internal or external calibration):</td><td>NA</td></tr>
<tr><td>Did calibration confirm proper functioning of monitoring equipment? (Yes / No):</td><td>NA</td></tr>
<tr><td>Is (are) calibration(s) valid for the whole reporting period?</td><td>NA</td></tr>
<tr><td>If applicable, has the reported data been cross-checked with other available data?</td><td>Yes, reported data in MR has been compared with the source provided and the ER sheet /2/</td></tr>
<tr><td>How were the values in the monitoring report verified?</td><td>The values in the monitoring report were compared against the values in ER sheet/2/</td></tr>
</table>

Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA.

SDG 4: Quality Education:

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Data / Parameter: (as in monitoring plan of VPA-DD):	i. Number of technical and support employment jobs created ii. Number of trainings, workshops conducted for employees.
Measuring frequency/Time Interval:	Continuous monitoring
Reporting frequency:	Continuous monitoring
Reported value:	i. The project has created 128 jobs of which 48 are technical and 80 are support staff ii. The 11 training programs conducted is given in Annex-1
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	Value Based on HR records
Is accuracy of the monitoring equipment as stated in the VPA-DD? If the VPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA.
Is the calibration interval in line with the monitoring plan of the VPA-DD? If the VPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with VPA-DD.
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, reported data in MR has been compared with the source provided and the ER sheet /2/
How were the values in the monitoring report verified?	The values in the monitoring report were compared against the values in ER sheet/2/
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.

In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA.

SDG 7: Affordable and Clean Energy:

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Data / Parameter: (as in monitoring plan of VPA-DD):	i. Number of SHWs installed ii. Change in Energy Use iii. Number of SWHs that have been provided with after sales services to end-users iv. Reduction of electricity charges due to use of SWHs on average per user.
Measuring frequency/Time Interval:	Continuous monitoring
Reporting frequency:	Continuous monitoring
Reported value:	i. The Number of SWHs installed in the 6 VPAs:

States	CPA2	CPA3	CPA4	CPA5	CPA6	CPA7	Total
Andhra Pradesh	456	219	208	92	162	80	1,199
Assam	18	2	76	68	105	20	289
Chattisgarh		100	46	4		2	152
Daman and Diu	1						1
Delhi	159	105	105	12			381
Goa	214	265	62	239	212	205	1,164
Gujarat	20	8					28
Haryana	50					15	65
Himachal Pradesh	14	89	221		7		331
Jammu & Kashmir	275		34				309
Jharkhand	4			12			16
Karnataka	11,764	15,841	15,101	16,340	18,783	19,498	93,675
Kerala	21	31	127	35			214
Madhya Pradesh	318	27					345
Maharashtra	265	437	269	265	40	59	1,313
Manipur		4				45	49
Meghalaya				13			13
Mizoram	35	48					83
Orissa	1	6		9	3	1	19
Pondicherry		3	6				9
Punjab	20			11		2	33
Rajasthan	6						6
Tamil Nadu	729	354	184	61	70	115	1,478
Telangana					1		1
Uttar Pradesh	109	82	9	5	3	28	236
Uttarakhand	27	708	500			27	1,263
West Bengal	56	28	5				89
Total	**14,562**	**18,357**	**16,953**	**17,166**	**19,386**	**20,097**	**106,521**

ii. Change in Energy Use: Due to the project activity there has been a reduction of use of 152,796 MWh of grid electricity during the monitoring period.

iii. Nearly 3,206 SWHs that have been provided with after sales services to end-users.

iv. Reduction of electricity charges due to use of SWHs on average per user: Based on the electricity tariffs and electricity saved in each of the state, the total monetary savings is Rs. 958.55 million for the monitoring period. Average yearly savings nationally is Rs. 8,999/SWH unit but ranging from Rs.1107 to Rs.156,447/year for various states, which depends on the sizes of the installed capacity and the electricity tariff for the state.

Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	Value Based on sample surveys
Is accuracy of the monitoring equipment as stated in the VPA-DD? If the VPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA.
Is the calibration interval in line with the monitoring plan of the VPA-DD? If the VPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with VPA-DD.
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, reported data in MR has been compared with the source provided and the ER sheet /2/ in which many SWHs with unique tank no. purchased on same invoice /3/.
How were the values in the monitoring report verified?	The values in the monitoring report were compared against the values in ER sheet/2/
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA.

SDG 8: Decent Work and Economic

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Data / Parameter: (as in monitoring plan of VPA-DD):	i. Total number of paid employees (full-time and part-time) ii. Total number of temporary employees iii. Number of paid employees engaged in after-sales service

	iv. Continued certification under ISO 9001:2015 v. Equal pay for work for equal value for both men and women
Measuring frequency/Time Interval:	Continuous monitoring
Reporting frequency:	Continuous monitoring
Reported value:	i. The total number of paid employees who are full time are 128. There are no part-time employees ii. All are permanent employees and there are no temporary employees. iii.The number of after sales employees engaged in after-sales services are 10. iv. Salaries are in accordance to their experience and position without discrimination of men or women. v. The pay scales for the positions are fixed without discrimination of men or women.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	Value Based on company Human Resource records
Is accuracy of the monitoring equipment as stated in the VPA-DD? If the VPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA.
Is the calibration interval in line with the monitoring plan of the VPA-DD? If the VPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with VPA-DD.
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, reported data in MR has been compared with the source provided and the ER sheet /2/
How were the values in the monitoring report verified?	The values in the monitoring report were compared against the values in ER sheet/2/
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically	NA.

possible been applied or has a request for deviation been approved?	

SDG 9: Industry, Innovation and Infratructure

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Data / Parameter: (as in monitoring plan of VPA-DD):	i. Research and development (R&D) expenditures
Measuring frequency/Time Interval:	Annual
Reporting frequency:	Annual
Reported value:	An amount of Rs. 3.14 million was spent on R&D during the monitoring period. These are towards salaries and expenses towards R&D personnel and equipment towards research and development.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	Value Based on the audited statement of the VPA implementing company
Is accuracy of the monitoring equipment as stated in the VPA-DD? If the VPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA.
Is the calibration interval in line with the monitoring plan of the VPA-DD? If the VPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with VPA-DD.
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, reported data in MR has been compared with the source provided and the ER sheet /2/
How were the values in the monitoring report verified?	The values in the monitoring report were compared against the values in ER sheet/2/
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically	NA.

possible been applied or has a request for deviation been approved?	

SDG 13: Climate Change

<table>
<tr><th>Monitoring Parameter Requirement</th><th>Assessment/ Observation by the VVB</th></tr>
<tr><td>Data / Parameter:
(as in monitoring plan of VPA-DD):</td><td>i. GHGs emissions reduction per year
ii. Improve education, awareness-raising and human and institutional capacity on climate change mitigation</td></tr>
<tr><td>Measuring frequency/Time Interval:</td><td>Annual</td></tr>
<tr><td>Reporting frequency:</td><td>Annual</td></tr>
<tr><td>Reported value:</td><td>i. The GHG emission reductions during the monitoring period is 139,747 tCO_2 from the 6 VPAs.
ii. Nuetech Solar Systems Pvt. Ltd. conducted 2 educational and awareness raising capacity building programs on climate change and its mitigation especially for college students during 2022-23. In association with Rotary Green Brigade, the CME conducted several orientation programs and awareness camps for college students. These programs are aimed at creating awareness about environment, climate change and various activities including renewable energy options that can be taken up to address climate change.

Vintage Year wise Emission Reductions is as follows:

<table>
<tr><th>VPA</th><th>Vintage Year 2022 (tCO_2)</th><th>Vintage Year 2023 (tCO_2)</th><th>Total (tCO_2)</th></tr>
<tr><td>VPA2</td><td>7,810</td><td>0</td><td>7,810</td></tr>
<tr><td>VPA3</td><td>8,791</td><td>0</td><td>8,791</td></tr>
<tr><td>VPA4</td><td>8,879</td><td>0</td><td>8,879</td></tr>
<tr><td>VPA5</td><td>35,490</td><td>8,751</td><td>44,241</td></tr>
<tr><td>VPA6</td><td>37,872</td><td>9,338</td><td>47,210</td></tr>
<tr><td>VPA7</td><td>18,303</td><td>4,513</td><td>22,816</td></tr>
<tr><td>Total</td><td>117,145</td><td>22,602</td><td>139,747</td></tr>
</table>
</td></tr>
<tr><td>Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)</td><td>Yes</td></tr>
<tr><td>Details of monitoring equipment:</td><td>Value Based on the VPAs.</td></tr>
<tr><td>Is accuracy of the monitoring equipment as stated in the VPA-DD? If the VPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?</td><td>NA</td></tr>
<tr><td>Calibration frequency /interval:
Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification</td><td>NA.</td></tr>
<tr><td>Is the calibration interval in line with the monitoring plan of the VPA-DD? If the VPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?</td><td>NA. QA/QC procedures stated in MR comply with VPA-DD.</td></tr>
<tr><td>Company performing the calibration(internal or external calibration):</td><td>NA</td></tr>
<tr><td>Did calibration confirm proper functioning of monitoring equipment? (Yes / No):</td><td>NA</td></tr>
</table>

Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, reported data in MR has been compared with the source provided and the ER sheet /2/
How were the values in the monitoring report verified?	The values in the monitoring report were compared against the values in ER sheet/2/
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA.

SDG 17: Partnerships for the Goals:

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Data / Parameter: (as in monitoring plan of VPA-DD):	Balance of payments and investment
Measuring frequency/Time Interval:	Annual
Reporting frequency:	Annual
Reported value:	During the monitoring period, Rs. 7.61 million was invested towards cumulative fixed and current assets and long-term loans and advances of the company.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	Value Based on the Audited Balance Sheet of the Company /16/.
Is accuracy of the monitoring equipment as stated in the VPA-DD? If the VPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA.
Is the calibration interval in line with the monitoring plan of the VPA-DD? If the VPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with VPA-DD.
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA

If applicable, has the reported data been cross-checked with other available data?	Yes, reported data in MR has been compared with the source provided and the ER sheet /2/
How were the values in the monitoring report verified?	The values in the monitoring report were compared against the values in ER sheet/2/
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA.

Appendix 7. Sustainable Development Contributions Achieved

<table>
<tr><th>Sustainable Development Goals Targeted</th><th>SDG Impact</th><th>Ex-ante Estimation</th><th>Amount Achieved</th><th>Units/ Products</th><th>VVB Assessment</th></tr>
<tr>
<td>13 Climate Action (mandatory)</td>
<td>i.GHGs emissions reduction per year
ii. Improve education, awareness-raising and human and institutional capacity on climate change mitigation</td>
<td>i. 226,613 tCO_2 reductions in monitoring period for VPA2-VPA7.
<table>
<tr><th>VPAs</th><th>ERs (tCO_2)</th></tr>
<tr><td>VPA 2</td><td>47,441</td></tr>
<tr><td>VPA 3</td><td>10,623</td></tr>
<tr><td>VPA 4</td><td>10,542</td></tr>
<tr><td>VPA 5</td><td>50,426</td></tr>
<tr><td>VPA 6</td><td>52,769</td></tr>
<tr><td>VPA 7</td><td>54,812</td></tr>
<tr><td>Total</td><td>226,613</td></tr>
</table>
ii. Conduct of atleast 1 educational and awareness raising capacity building programs for college students.</td>
<td>i. 139,747 tCO_2 reductions in the monitoring period for VPA2-VPA7.
<table>
<tr><th>VPAs</th><th>ERs (tCO_2)</th></tr>
<tr><td>VPA 2</td><td>7,810</td></tr>
<tr><td>VPA 3</td><td>8,791</td></tr>
<tr><td>VPA 4</td><td>8,879</td></tr>
<tr><td>VPA 5</td><td>44,241</td></tr>
<tr><td>VPA 6</td><td>47,210</td></tr>
<tr><td>VPA 7</td><td>22,816</td></tr>
<tr><td>Total</td><td>139,747</td></tr>
</table>
ii. Conduct of 2 educational and awareness raising capacity building programs for school and college students and citizens in association with Rotary Green Brigade.</td>
<td>i.tCO_2
ii.Number</td>
<td>VVB has reviewed the ER sheet /02/, database/03/,monitoring survey /06/ and same has been cross checked during onsite visit /15/. VVB has assessed the SDG impact and found appropriate.</td>
</tr>
</table>

3 Good Health and Well Being.	i.Number of SWHs installed ii.MWh of grid electricity avoided leading to avoidance of SO_2 and NO iii.Number of deaths avoided	Values are based on those estimated ex-post.	Implementation of 106,521 SWH units for VPA2-VPA7, which reduced use of 152,796 MWh of grid electricity leading to avoidance of 1322 tSO_2 and 367 tNO and avoidance of 17 deaths during the monitoring period.	i.Number ii.MWh and tSO_2 and tNO iii.Number	VVB has reviewed the ER sheet /02/, database/03/,monitoring survey /06/ and same has been cross checked during onsite visit /15/. VVB has assessed the SDG impact and found appropriate.
4 Quality Education	i. Number of technical and support employment jobs created ii.Number of trainings, workshops conducted for employees.	Values are based on those estimated ex-post.	i.Created 128 jobs of which 48 are technical and 80 support staff and conduct ii. Conduct of 11 training programs	i.Number ii.Number	VVB has reviewed the ER sheet /02/, database/03/, training records /08/ and same has been cross checked during onsite visit /15/. VVB has assessed the SDG impact and found appropriate.
7 Affordable and Clean Energy	i.Number of SHWs installed ii.Change in Energy Use iii.Number of SWHs that have been provided with after sales services to end-users iv.Reduction of electricity charges due to use of SWHs on average per user.	Values are based on those estimated ex-post.	Installation of 106,521 SWHs, reduction of use of 152,796 MWh grid electricity; 3,206 SWHs provided with after sales services and reduction of about Rs. 958.55 million due to avoidance of use of grid electricity by end users.	i.Number ii.MWh iii.Rs.	VVB has reviewed the ER sheet /02/, database/03/,monitoring survey /06/ and same has been cross checked during onsite visit /15/. VVB has assessed the SDG impact and found appropriate.
8 Decent Work and Economic Growth	i.Total number of paid employees (full-time and part-time) ii.Total number of temporary employees iii.Number of paid employees engaged in after-sales service iv.Continued certification under ISO 9001:2015	Values are based on those estimated ex-post.	Paid 128 employees with 10 sales employees engaged in after-sales services and certification of Nuetech Solar Systems Pvt. Ltd. for Quality Management Systems, i.e. ISO 9001:2015. There is no discrimination of pay for men and women in the company	i.Number ii.Number iii.Number iv. ISO v. number	VVB has reviewed the ER sheet /02/, database/03/,employment records /07/ and same has been cross checked during onsite visit /15/. VVB has assessed the SDG impact and found appropriate.

	v.Equal pay for work for equal value for both men and women				
9. Industry, Innovation and Infrastructure	i. Research and development (R&D) expenditures	Values are based on those estimated ex-post.	Rs. 3.14 million spent on R&D towards salaries and expenses towards R&D personnel and equipment towards research and development.	Rs.	VVB has reviewed the ER sheet /02/, database/03/,monitoring survey /06/, SDG contribution documents /16/ and same has been cross checked during onsite visit /15/. VVB has assessed the SDG impact and found appropriate.
17. Partnerships for the Goals	i.Balance of payments and investment	Values are based on those estimated ex-post.	Rs. 7.61 million was invested during the monitoring period.	Rs.	VVB has reviewed the ER sheet /02/, database/03/,monitoring survey /06/ along with SDG contribution documents /16/ and same has been cross checked during onsite visit /15/. VVB has assessed the SDG impact and found appropriate.

Section G.1 of the monitoring report includes a list of all inputs and grievances received, as well as information on how the CME addressed the complaints received through the Continuous Input and Grievance Mechanism during the monitoring period. Furthermore, during on-site interviews and discussions /15/, it was confirmed that the CME addressed all disputes, inputs, and comments received through the Continuous Input and Grievance Mechanism during the monitoring period. This was confirmed on the basis of the review of the database, during the visit to the CME office.

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Document information

Version	*Date*	*Description*
04.0	6 April 2021	Revision to: • Reflect the "Clarification: Regulatory requirements under temporary measures for post-2020 cases" (CDM-EB109-A01-CLAR).
03.0	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the "CDM validation and verification standard for programmes of activities" (CDM-EB93-A08-STAN); • Make structural and editorial improvements.
02.0	29 December 2017	Revision to align with the requirements of the "CDM validation and verification standard for programme of activities" (version 01.0).
01.0	5 June 2015	Initial publication.

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