




**Validation report form for renewal of CDM programme of activities period
(Version 02.0)**

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 UNFCCC Ref No: 8855
Number and duration of the next period	Number of period: 2 Duration: 31/12/2019 – 30/12/2026
Version number of the validation report	2
Completion date of the validation report	14/02/2020
Version number of PoA-DD to which this report applies	11
Coordinating/managing entity (CME)	Nuetech Solar Systems Pvt. Ltd
Host Parties	India
Applied methodologies and standardized baselines	AMS.I.C./Version 21 “Thermal energy production with or without electricity”
Mandatory sectoral scopes	Sectoral Scope 1: Energy industries (renewable - / non-renewable sources)
Conditional sectoral scopes, if applicable	NA
Estimated amount of annual average GHG emission reductions or GHG removals by sinks in the next programme of activities period	NA
Name and UNFCCC reference number of the DOE	4K Earth Science Private Limited UNFCCC Ref No: E-0069
Name, position and signature of the approver of the validation report	S. Jagajothi  Director

SECTION A. Executive summary

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4K Earth Science Private. Limited has been contracted by 'Nuetech Solar Systems Pvt. Ltd' to perform a validation of the registered registered PoA 'Solar Water Heater Program in India' (UNFCCC Ref #8855) in India for renewal of program of activities period.

The scope of the validation is defined as an independent and objective review of the revised PoA design document including revised CPA inclusion criteria, project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against the CDM validation and verification standard for Programme of activities (version 02), CDM project cycle procedure for programmes of activities (version 02) and CDM project standard for programmes of activities (version 02), Kyoto Protocol requirements and UNFCCC rules.

The report is based on the assessment of the PoA design document undertaken through stakeholder consultations, application of standard auditing techniques including but not limited to desk review, follow up actions (e.g., on site visit, electronic (telephone or e-mail) interviews) and also the review of the applicable approved methodological and relevant tools, guidance and CDM decisions.

The program of activity is to install a Solar water heating system (SWH) in residential as well as commercial buildings throughout India. The program avoids electricity generated from fossil fuels intensive grid power plants by using renewable energy to meet hot water requirement and will result in reduction of CO₂ emissions.

The review of the PoA design documentation and the subsequent follow-up interviews have provided 4KES with sufficient evidence to determine the project's fulfillment of all the stated criteria. In our opinion, the PoA meets all applicable UNFCCC requirements for the CDM PoA.

☒ The PoA will be recommended to the CDM Executive Board with a request for renewal of crediting period.

☐ The project is not recommended for renewal of crediting period

SECTION B. Validation team, technical reviewer and approver**B.1. Validation team member**

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interview(s)	Validation findings
1.	Team Leader and Technical Expert	IR	Kumar	Narendra	Central office	X	X	X	X
2.	Local Expert	IR	S R	Anand	Central office		X	X	

B.2. Technical reviewer and approver of the validation report for renewal of PoA period

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Puratchikkanal	Ma Paa	Central office
2	Approver	IR	Jagajothi	S	Central Office

SECTION C. Means of validation**C.1. Desk/document review**

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The report is based on the assessment of the PoA design document undertaken through stakeholder consultations, application of standard auditing techniques including but not limited to desk review, follow up actions (e.g., on site visit, electronic (telephone or e-mail) interviews) and also the review of the applicable approved methodological and relevant tools, guidance and CDM decisions.

All the documents used for arriving validation conclusion are listed in Appendix 03 and referenced accordingly in validation report.

C.2. On-site inspection

Duration of on-site inspection: 02/11/2019 to 03/11/2019				
No.	Activity performed on-site	Site location	Date	Team member
1.	Opening Meeting	Nuetech office	02/11/2019	Narendra Kumar R Anand SR
2	Visit to sampled of households of CPAs	Beneficiary households	02/11/2019 & 03/11/2019	Narendra Kumar R Anand SR
3	Document review & Closing meeting	Nuetech office	03/11/2019	Narendra Kumar R Anand SR

C.3. Interviews

N o.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	B	Prakash	Nuetech	02/11/2019 & 03/11/2019	- Roles and responsibilities - End user agreement - Technical details - Revised baseline - Revised monitoring requirement - Revised CPA inclusion criteria - Stakeholder consultation process	NKR & ASR
2	T	Ananth	Nuetech	02/11/2019 & 03/11/2019		
3	Padmanabha	Sudha	FCN	02/11/2019 & 03/11/2019	- Revised Baseline assessment - Issues in the PDD - Latest methodology application - Revised CPA inclusion criteria - Revised ER estimation	NKR & ASR
4	K	Yuvaraj	Beneficiary	02/11/2019	- Monitoring procedure - Data collection - Repair & maintenance	NKR & ASR
5		Bhagya		02/11/2019		
6	Murthy	Brugu		02/11/2019		
7	N V	Manjula		02/11/2019		
8		Jaya		02/11/2019		

9	A C	Gangappa	02/11/2019
10		Hemalatha	02/11/2019
11	V	Sahana	02/11/2019
12		Lakshmamma	02/11/2019
13	Chabbi	Renuka	02/11/2019
14		Baby	03/11/2019
15		Bagyamma	03/11/2019
16	H T	Jagadeesh	03/11/2019
17		Lakshmipathi	03/11/2019
18	N	Naveen kumar	03/11/2019
19	K N	Satisha	03/11/2019
20		Vasanth Kumara	03/11/2019
21	N	Swamy	03/11/2019
22		Saraswati	03/11/2019
23		Vijayalakshmi	03/11/2019
24		Sunanda	03/11/2019

C.4. Sampling approach

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No sampling approach applied in the validation of the RCP.

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

Area of validation findings	No. of CL	No. of CAR	No. of FAR
Programme of activities			
Compliance with PoA-DD form	-	-	-
Programme of activities period	-	-	-
Coordinating/managing entity and the project participants	-	-	-
Post-registration changes	-	-	-
Generic component project activities			
Application and selection of methodologies and standardized baselines	-	1	-
Validity of original baseline or its update	-	-	-
Estimated emission reductions or net anthropogenic removals	-	-	-
Validity of monitoring plan	3	1	-
Eligibility criteria for inclusion of CPAs	1	-	-
Description of Technology		1	-
Total	4	3	-

SECTION D. Validation findings

D.1. Programme of activities

D.1.1. Compliance with PoA-DD form

Means of validation	Validation team checked the PoA Design Document with latest version of 'Program of activities design document form' in the UNFCCC website (ie, version 09.0)/9/ and "Instructions for completing this form" mentioned as attachment to PoA design document form (version 09.0)/9/.
Findings	No finding
Conclusion	Validation team confirms that final PoA-DD is completed using the valid version of the applicable PoA-DD form at the time of submission.

D.1.2. Programme of activities period

Means of validation	As per the latest version of PoA-DD form, there is no requirement to provide the PoA period. However, as per the standard requirement mentioned in para 283 of 'CDM Project standard for program of Activities' version 02, 7 years has been considered as PoA period. Hence, the PoA period for the current renewal is
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	31/12/2019 – 30/12/2026.
Findings	No finding
Conclusion	The programme of activities period is considered as 7 years as per the requirements of 'CDM Project standard for program of Activities' version 02.

D.1.3. Coordinating/managing entity and the project participants

Means of validation	<p>As per the Section A.4 of the PoA-DD, the Coordinating and Managing entity of the PoA is 'Nuotech Solar Systems Pvt. Ltd'.</p> <p>As per the Section A.5 of the PoA-DD, the project participants of the PoA are 'Nuotech Solar Systems Pvt. Ltd' and Carbonbay GmbH & Co. KG.</p> <p>The names of the CME and project participants are checked and found to be in consistent with the in the latest version of the MoC statement available in the UNFCCC website.</p>
Findings	No finding
Conclusion	The names of CME & PP mentioned in the PoA-DD are in consistent with the latest version of MoC available in the UNFCCC website. Hence, it is in line with the requirements of para 294 of the 'CDM project standard for programmes of activities', version 2

D.1.4. Post-registration changes

Type of post-registration changes (PRCs)	Confirmation (Y/N)	Validation report for PRCs	
		Version	Completion date
Corrections	N	NA	NA
Inclusion of monitoring plan	N	NA	NA
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents	N	NA	NA
Changes to the programme design	N	NA	NA
Addition of CPA inclusion template	N	NA	NA
Changes specific to afforestation and reforestation activities	N	NA	NA
Change of coordinating/managing entity	N	NA	NA

D.2. Generic component project activities

D.2.1. Application and selection of methodologies and standardized baselines

Means of validation	<p>At the time of registration, the project applied the following methodology</p> <ul style="list-style-type: none"> AMS-I.C. ver. 19 - Thermal energy production with or without electricity <p>During the renewal of the crediting period, the latest version of AMS. I.C is used:</p> <ul style="list-style-type: none"> AMS-I.C. ver. 21 - Thermal energy production with or without electricity <p>The assessment team has validated the documentation referred to in the revised PoA-DD for renewable of crediting period and verified the documentation content for verifying the justification of the applicability of the methodology AMS I.C Version 21 and confirmed that the documentation referred to in the PDD is correctly quoted and interpreted. The applicability of the methodology AMS I.C, version 21.0 is assessed as below:</p> <ul style="list-style-type: none"> Program aims at distribution/installation of SWH in buildings (residential and commercial). Hence, the program comprises renewable energy technology that supply users. Based on the "maximum output" of glazed flat plate or evacuated tube collector of 700 Wth/m², the maximum eligibility limits for the aperture area is set as
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	<p>64,000 m² of the collector to limit the total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW thermal.</p> <p>- The thermal capacity limit of the solar water heater for the whole CPA will be limited to 45 MWth and for individual SWH system capacity will be limited to 0.45 MWth.</p>
Findings	No finding
Conclusion	The PoA fulfils all relevant criteria of the applied methodology 'AMS-I.C.: Thermal energy production with or without electricity' - Version 21.0. Hence use of the selected methodology is appropriate for this program of activity.

D.2.2. Validity of original baseline or its update

Means of validation	<p>Validation team checked the registered PoA-DD (of 1st CP) and the revised PoA-DD submitted for the validity of original baseline or its update.</p> <p>The baseline of the project activity is continued use of the systems (electric geyser) that were used before the implementation of the SWH system. Hence, the baseline emission is estimated based on the parameters grid electricity avoided due to the project activity and the emission factor of grid.</p> <p>As per para 382 of CDM Validation and Verification standard (version 2), validity of the original baseline or its update is assessed as below:</p> <p>a) As per the PoA-DD, the only baseline parameter which can be affected by changed in policies and circumstances is 'CO₂ emission factor of the Indian grid'. The grid emission factor takes into consideration the impact of:</p> <ul style="list-style-type: none"> All the new relevant mandatory national and/or sectoral policies, including the Electricity Act 2003, National Electricity Policy and Tariff Policy and all the respective State Governments' and state regulatory commissions' policies on Renewable Energy Sector; and Any changes in circumstances or conditions, for example, change in market characteristics, the availability of fuels for power generation or raw materials for developing new power generation capacity as well as the impact of electricity or fuel prices. <p>However as per the registered PoA & the revised PoA-DD, the baseline parameter 'CO₂ emission factor of the Indian grid' is an ex-post parameter and no other data or parameters are used for determining the original baseline, that were determined ex-ante are sensitive to changes in policies or circumstances. All the ex-ante fixed parameters are constants or default parameters. Hence, no update of the ex-ante parameter is required during this renewal of crediting period.</p> <p>b) The latest methodology AMS I.C, version 21 is applied correctly in the determination of the updated baseline and the estimation of GHG emission reductions for the applicable PoA period. The methodology AMS I.C, version 21 refers the latest version of the 'Tool to calculate emission factor of an electricity system' in estimation of baseline parameter 'CO₂ emission factor of the Indian grid'. Since, the parameter is an ex-post parameter, in the monitoring parameter table it is mentioned that the parameter will be determined based on the latest version of the methodological tool to calculate the emission factor for an electricity system. Also for the ex-ante calculation the CME used Tool to calculate the emission factor for an electricity system Version 07.0 for the emission factor calculation which is the latest available tool.</p>
Findings	No finding
Conclusion	The only baseline parameter affecting the baseline emission that is sensitive to changes in policies and circumstances is 'CO ₂ emission factor of the Indian grid'. However, this parameter is ex-post monitoring parameter; not an ex-ante fixed parameter. Hence, no update on this parameter required.

	<p>Since no baseline parameter is fixed ex-ante which is sensitive to changes in policies and circumstances, updating of baseline parameter is not required during the renewal of crediting period. This is in line with para 291 of the CDM Project standard for PoA, version 2</p> <p>The latest methodology and tools are applied correctly for determination of the updated baseline and the estimation of GHG emission reductions for the applicable PoA period</p>
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D.2.3. Estimated emission reductions or net anthropogenic removals

Means of validation	<p>The validation team checked whether the equations and parameters proposed to calculate GHG emission reductions or net anthropogenic GHG removals for CPAs are in accordance with the applied methodology.</p> <p>Validation team checked section I.6.3 of the PoA-DD to confirm whether all formulae to calculate baseline emissions, project emission and leakage have been applied in line with the underlying methodology.</p> <p>BASELINE EMISSION:</p> <p>As per formula (3) in the methodology AMS-I.C, version 21 applies, the baseline emission will be calculated as below:</p> $BE_{thermal,CO2,y} = \sum_{n=1}^{n=N} \frac{EG_{thermal,n,y}}{\eta_{BL,thermal}} \times EF_{FF,CO2,y}$ <p>In which:</p> <table> <tr> <td>$BE_{thermal, CO2,y}$</td><td>The baseline emissions from steam/heat displaced by the project activity during the year y (tCO₂e/year)</td></tr> <tr> <td>$EG_{thermal,y}$</td><td>The net quantity of steam/heat supplied by the project activity during the year y (GJ/year)</td></tr> <tr> <td>$EF_{FF,CO2,y}$</td><td>The CO₂ emission factor of the fossil fuel that would have been used in the baseline plant obtained from reliable local or national data, if available, alternatively, IPCC default emission factors can be used. (tCO₂e /GJ)</td></tr> <tr> <td>$\eta_{BL,thermal}$</td><td>The efficiency of the plant using fossil fuel that would have been used in the absence of the project activity</td></tr> </table> <p>Since the electricity is used to generate thermal energy in the baseline condition using electric water heater, the project will replace the grid electricity. Hence, as per the PoA-DD submitted, the formula for baseline emission is modified as below (considering both category I & category II systems):</p> $BE_{thermal,CO2,y} = \sum_{n=1}^{n=N} \frac{EG_{thermal,n,y,CAT I}}{\eta_{EWH}} \times EF_{grid,y} + \sum_{n=1}^{n=N} \frac{EG_{thermal,n,y,CAT II}}{\eta_{EWH}} \times EF_{grid,y}$ <p>In which:</p> <table> <tr> <td>$EF_{grid,y}$</td><td>The CO₂ emission factor of the Indian grid (tCO₂e /MWh)</td></tr> <tr> <td>$EG_{thermal,n,y, CAT I,}$</td><td>The net quantity of steam/heat supplied by the project activity from Category I systems during the year y (MWh/year)</td></tr> <tr> <td>$EG_{thermal,n,y, CAT II,}$</td><td>The net quantity of steam/heat supplied by the project activity from Category II systems during the year y (MWh/year)</td></tr> <tr> <td>η_{EWH}</td><td>The efficiency of an electric water heater</td></tr> <tr> <td>N</td><td>Total number of the SWH systems</td></tr> </table> <p>The formula is verified and found to be appropriate for estimation of baseline emission of CPAs under this PoA and in line with the requirements of applied methodology AMS-I.C, version 21.</p>	$BE_{thermal, CO2,y}$	The baseline emissions from steam/heat displaced by the project activity during the year y (tCO ₂ e/year)	$EG_{thermal,y}$	The net quantity of steam/heat supplied by the project activity during the year y (GJ/year)	$EF_{FF,CO2,y}$	The CO ₂ emission factor of the fossil fuel that would have been used in the baseline plant obtained from reliable local or national data, if available, alternatively, IPCC default emission factors can be used. (tCO ₂ e /GJ)	$\eta_{BL,thermal}$	The efficiency of the plant using fossil fuel that would have been used in the absence of the project activity	$EF_{grid,y}$	The CO ₂ emission factor of the Indian grid (tCO ₂ e /MWh)	$EG_{thermal,n,y, CAT I,}$	The net quantity of steam/heat supplied by the project activity from Category I systems during the year y (MWh/year)	$EG_{thermal,n,y, CAT II,}$	The net quantity of steam/heat supplied by the project activity from Category II systems during the year y (MWh/year)	η_{EWH}	The efficiency of an electric water heater	N	Total number of the SWH systems
$BE_{thermal, CO2,y}$	The baseline emissions from steam/heat displaced by the project activity during the year y (tCO ₂ e/year)																		
$EG_{thermal,y}$	The net quantity of steam/heat supplied by the project activity during the year y (GJ/year)																		
$EF_{FF,CO2,y}$	The CO ₂ emission factor of the fossil fuel that would have been used in the baseline plant obtained from reliable local or national data, if available, alternatively, IPCC default emission factors can be used. (tCO ₂ e /GJ)																		
$\eta_{BL,thermal}$	The efficiency of the plant using fossil fuel that would have been used in the absence of the project activity																		
$EF_{grid,y}$	The CO ₂ emission factor of the Indian grid (tCO ₂ e /MWh)																		
$EG_{thermal,n,y, CAT I,}$	The net quantity of steam/heat supplied by the project activity from Category I systems during the year y (MWh/year)																		
$EG_{thermal,n,y, CAT II,}$	The net quantity of steam/heat supplied by the project activity from Category II systems during the year y (MWh/year)																		
η_{EWH}	The efficiency of an electric water heater																		
N	Total number of the SWH systems																		

The $EG_{thermal}$ for category I system will be estimated applying any one of the methods mentioned below based on the relevant data availability:

Method 1

This method shall be used if output temperature data available (either from test result or MNRE criteria).

$$EG_{thermal,n,y,catI} = \frac{V_{catI,n}(T_{out}-T_{in}) \times S_{op} \times D \times C_w}{F \times 1000}$$

Where

$V_{catI,n}$	Amount of water heated daily in the CPA by Category I system n (m^3/day)
T_{in}	Average input temperature (K)
T_{out}	Average output temperature (K)
S_{op}	Share of systems confirmed to be operational
D	Number of operational days in year y (days/year)
C_w	Specific Heating Capacity of water (default value is 4.1855) (J/g/K)
F	Conversion factor from MJ to kWh (factor is 3.6 MJ/kWh)

Method 2:

This method shall be used if Average amount of energy collected per system is available (either from test result or MNRE criteria).

$$G_{thermal,n,y,catI} = \frac{V_{catI,n} \times Q_n \times S_{op} \times D}{100} \quad (4)$$

Where

$V_{catI,n}$	Amount of water heated daily in the CPA by Category I system n (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 100litre water (kWh/day/100l)
S_{op}	Share of systems confirmed to be operational
D	Number of operational days in year y (days/year)

Validation team checked the formula provided to estimate $EG_{thermal}$ for category system and found to be appropriate and in line with the methodological requirement.

For category II system, $EG_{thermal}$ will be monitored directly by installing BTU meter at the systems. Validation team find this approach to be appropriate and in line with the methodological requirements.

PROJECT EMISSION:

Validation team checked the project emission approach provided in the PoA-DD. As per the PoA-DD, the project emission from the electricity consumption will be estimated for the system which is equipped with an electric pump for a forced flow of fluid in the collector as below:

$$PE_{EC,y,n,II} = \sum_{n=1}^N EC_{PJ,n,y} \times EF_{grid,y} \times (1 + TDL_y)$$

Where

$PE_{EC,y,n,II}$	Project emissions from electricity consumption by category II system n from the grid during the year y ($tCO_2e/year$)
$EC_{PJ,n,y}$	Quantity of electricity consumed by the Category II system n in year y (MWh/year)
TDL_y	Average technical transmission and distribution losses for providing electricity to the category II system (%)

	<p>This formula for estimation of project emission is found to be appropriate and in line with the “TOOL05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation”, version 3.</p> <p>LEAKAGE: As per the applied methodology “Leakage is relevant if equipment is the energy generating equipment is being transferred from outside the project boundaries”. As per the CPA inclusion criteria only new SWH will be considered in any CPA. Hence, leakage is not applicable for the CPAs under the PoA.</p> <p>EMISSION REDUCTION As per the PoA-DD, the emission reduction is estimated as below:</p> $ER_y = BE_y - (PE_y + LE_y)$ <p>Where</p> <p>ER_y Emission reductions by the project activity during a given year y (tCO₂e/year)</p> <p>BE_y Baseline emissions of the project activity during the year y (tCO₂e/year)</p> <p>PE_y Project emissions of the project activity during the year y (tCO₂e/year)</p> <p>LE_y Leakage emissions in the year y (tCO₂e/year)</p> <p>The formula is correct and in line with the applied methodology.</p>
Findings	No finding
Conclusion	<p>Validation team confirm that the algorithms and formulae proposed to calculate project emissions, baseline emissions, leakage and emission reductions in the PoA-DD is in line with the requirements of the selected methodology AMS I.C, version 21.</p> <p>The assessment team also confirms that all estimates of the baseline emissions, project emissions and Leakage emissions can be replicated using the data and parameter values provided in the generic CPA-DD in the PoA-DD.</p>

D.2.4. Validity of monitoring plan

Means of validation	<p>Validation team checked whether existing monitoring plan followed during the 1st crediting period monitoring the plan is still valid for the 2nd crediting period or not. Validation team checked the monitoring plan provided in the revised PoA-DD and crosschecked with the monitoring plan provided in the PoA-DD of 1st crediting period.</p> <p>Validation team also checked whether the monitoring plan provided in the revised PoA-DD is in consistent with requirements of the applied methodology (AMS I.C, version 21).</p> <p>The operational and management structure has been clearly described in Section B under “Management System” of the PoA-DD and section I of the generic CPA within the PoA-DD and is in compliance with the envisioned situation. The responsibilities, roles and institutional arrangements for data capturing and archiving has been mentioned elaborately and found acceptable.</p> <p>The information provided in the PoA-DD has been found in compliance with the information evaluated during the site visit, while interviewing with the concerned people and the same was re-affirmed through the documentary evidence.</p> <p>The monitoring plan described in the CPA-DD is in compliance with the applied methodology and PoA-DD. The assessment team has reviewed all the parameters in the monitoring plan against the requirements of the applied methodology and confirmed that monitoring parameters are applied in line with the requirement of the methodology and relevant in the context of the program. The procedures have</p>
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been reviewed by the assessment team through document review and interviews with the respective department's personnel. The information provided has allowed the assessment team to confirm that the proposed monitoring plan is feasible within the project design. The relevant points of monitoring plan have been discussed with the CME. Specifically, these points include the monitoring methodology, data management, and the quality assurance and quality control procedures to be implemented in the context of the project. Therefore, the CME will be able to implement the monitoring plan and the achieved emission reductions can be reported ex-post and verified.

The parameters that are to be fixed ex-ante are:

Parameter	Value	Source
$V_{\text{catl},n}$ (Aggregated amount of water heated daily in each CPA by Category I system n)	To be included for each CPA	CPA database (based on the actual SWH systems installed under the CPA)
η_{EWH} (Efficiency of an electric water heater system)	100%	Methodology default value (AMS-I.C., version 21, paragraph 43.)
TDL_y (Average technical transmission and distribution losses for providing electricity to the category II system)	20%	Default value (TOOL05 "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (Version 03.0), page 14.)
T_{in} (Average input temperature)	To be included for each CPA	Standards from the government of India or a specific test report of the SWH model(s) used in the CPA
T_{out} (Average output temperature)	To be included for each CPA	Standards from the government of India or a specific test report of the SWH model(s) used in the CPA
C_w (Specific Heating Capacity of water)	4.1855 J/g/K	Default value
F (Conversion factor from MJ to KWh)	3.6 MJ/KWh	Conversion factor
Q_n (Average amount of energy collected by the SWH during a Thermal Performance Test at day-time under standard conditions for 100litre water)	To be included for each CPA	Performance test reports sponsored by or following the standards from the MNRE or a relevant government authority

The parameters that are to be monitored ex-post are:

Parameter	Monitoring Details
D (Number of operational days in year y)	The parameter will be monitored through sample survey annually among the SWH users of the specific CPA.
S_{op} (Share of systems confirmed to be operational)	The parameter will be monitored through sample survey annually among the SWH users of the specific CPA.
$\text{EG}_{\text{thermal, CAT II},y}$ (The aggregated amount of thermal energy generated by SWH category II unit n in year y (MWh))	This parameter will be monitored continuously through BTU meters installed at the category II systems.

	EC_{PJ,n,y} Quantity of electricity consumed by the Category II system n in year y)	This parameter will be monitored continuously through Energy meters installed at the category II systems which are equipped with pumps.
	EF_{grid,y} (The CO ₂ emission factor of the Indian grid)	This parameter will be determined based on the latest CO ₂ Baseline Database for the Indian Power Sector User Guide published by Central Electricity authority as per the tool to calculate emission factor of an electricity system.
<p>The monitoring plan content has been checked in the generic CPA and compared against the requirements of the monitoring methodology</p> <p>All means of implementing the monitoring plan are in line with the applied and monitoring methodology. The validation team has no doubts that the monitoring arrangements as described in the part II of PoA-DD will be implemented properly.</p> <p>Sampling plan: The PoA-DD indicates a sampling plan as per the recommendation outlined in 'Guideline for Sampling and Surveys for CDM Project Activities and Programme of Activities, version 04' (which also has normative reference to Sampling Standard, version 07) has been referred.</p> <p>Assessment team confirms that the sampling method (stratified sampling) is clearly described and is in line with the description of the population. The sampling plan transparently describes how the samples will be selected. CME also demonstrates how Stratified Sampling is suitable for the CPAs under the PoA and basis for the stratification also provided. The CME also provided formula for sample size calculation and reliability requirements in line with the sampling guidelines.</p>		
Findings	CL-01, CL-02 & CL-03 are raised and closed.	
Conclusion	The validation team confirms that the monitoring plan based on the approved monitoring methodology, is included in the PoA-DD and is correctly applied to the CDM PoA. The monitoring plan has been found to be in compliance with the requirements of the applied methodology. The monitoring plan will give opportunity for real measurements of achieved emission reductions. The validation team considers that monitoring arrangements described in the monitoring plan is feasible within the project design.	

D.2.5. Eligibility criteria for inclusion of CPAs

Means of validation			
	No	Eligibility criteria	Means of Validation
	1	All SWH listed in the proposed SSC-CPA must be within the geographical boundary of India.	<p>This criterion will ensure that all CPAs are within the geographical boundary set by the PoA (India).</p> <p>This can be crosschecked by verifying the address of the SWH system in CPA database & invoices.</p> <p>Hence, the criteria and supporting evidences are appropriate.</p>
	2	The technology used under the proposed SSC-CPA consists of a solar energy based water heating system.	<p>The criteria will ensure that the CPAs that install only solar water heating system will be included under the PoA.</p> <p>This can be checked via Technical details mentioned in the CPA-DD.</p>

			The referenced documents are deemed to be appropriate to show fulfilment of the criterion. This will be checked and confirmed at the time of CPA inclusion as per the methodology. The criterion deems objective and comprehensive to allow assessment and inclusion of the CPA into the registered PoA.
	3	The aggregated surface of the collectors of all systems in the CPA should not exceed 64,000 m ² . ¹	Since the aggregated surface area of the solar water heater of 64,000 m ² translate to the 45 MWth capacity, the criteria is appropriate to limit scale of CPAs under the PoA to small scale. This can be crosschecked via the total surface area of the SWHs will be recorded as part of the CME's database derived from the installation record.
	4	The SSC-CPA follows the baseline and monitoring methodology AMS-I.C. version 21 and should meet its eligibility criteria as discussed in section B.2. of Part II.	The criteria will ensure the CPAs that included under the PoA confirms the requirements of applied methodology of PoA The criterion is in line with the requirement of applied methodology and CDM PS for PoAs, version 02.
	5	The SWH collector area of an individual system should not be more than 640 m ² .	The criteria will confirm the debundling requirements of the CPAs under the PoA. As per the Tool 20: Methodological tool: Assessment of debundling for small-scale project activities Version 04.0, the CPAs are exempted from debundling check if the individual elements of the CPA have a capacity below 1% of the small scale threshold. 1% of the small scale threshold limit translates to 640 m ² collector area. Hence, the criterion is appropriate.
	6	Confirmation that this SSC-CPA, nor any of its SWH systems is not yet registered and not being registered as a standalone CDM project by ensuring that the CPA has the full title over the emission reductions generated by the SWH users listed in the CPA. To confirm this, all owners of the SWH systems in the CPA should have transferred the title to the emission reductions to the CME, either directly or through the CPAI.	This criteria confirms that the devices/CPAs included under the PoA are not included under any other CDM project or PoA. This can be crosschecked via sales contract if the CME and CPA implementer are same. If the CPA implementer is other than CME, the CER rights transfer shall be crosschecked via agreement between CME & CPA implementer for inclusion of CPA under the PoA. Hence, the condition is appropriate to confirm the CPAs are neither registered as CDM project

¹ Value obtained from Annex 3 of the Small Scale Working Group (SSC WG) Meeting 07.

		activities, included in another registered PoAs
7	Each SWH in the SSC-CPA shall be uniquely identified and defined in an unambiguous manner by providing the address, and/or the system serial number of the collectors installed at each location.	With the address and unique serial number allotted to each devices under a CPA, the double counting of any devices shall be avoided. The unique serial number and address shall be checked from the project database to identify any double counting. Hence, the criterion set is adequate
10	The start date of the CPA is not after the date of delivery or construction of the first SWH installed. Documented evidence is available to confirm that date. For example an invoice, installation or delivery form	With this criterion, we can confirm the start date of a CPA is not after the date of delivery or construction of the first SWH installed. This can be checked through CPA project database & invoice copies of the SWH included in a CPA. Hence, the criterion set is adequate.
11	The CPA is additional according to the criteria for confirmation of additionality for its inclusion into the PoA in section C.	As per the Section C of the PoA, the additionality shall be demonstrated using any of the below two option: <u>Option 1: No legal obligation combined with a barrier due to prevailing practice</u> – This requires to prove that the market penetration of technology is less than 33% at the state level and also to prove that no legal obligation to use SWH in the CPA state. <u>Option 2: Micro scale</u> - This requires to prove that the capacity of the subsystems under CPA is equal or less than 4500 kWth capacity and the end users of the subsystems are households, communities or SMEs This is in line with the registered PoA-DD of the 1 st crediting period. Hence, the criterion set is adequate
12	A confirmation that no funding from Annex 1 parties has been used for this CPA or that, if used, this did not result in a diversion of official development assistance.	The criterion is adequate to confirm that no ODA fund received for the CPAs included in the PoA. This can be verified from the confirmation provided by the CPA implementer.
13	Stakeholder consultations can be organised for a group of CPAs if they can be demonstrated to be in similar geographic areas and time (start of construction/	This criterion is adequate to confirm the requirements of stakeholder consultation meeting at the CPA level.

		implementation within the same two years), similar socio-economic situations, identical activity or technology etc.	This can be verified from Stakeholder consultation minutes from the CME/CPA implementer that the meeting is planned.
	14	Leakage is not relevant since there is no energy generating equipment transferred from outside the project boundaries and no second-hand installations will be used in the project.	This condition is adequate to confirm that there is no leakage emission will occur in the CPA. This can be verified from the confirmation from CME/CPA implementer.
Findings	CL-04 is raised and closed		
Conclusion	<p>The validation team confirms the following:</p> <ul style="list-style-type: none"> • The updated CPA inclusion criteria given in the section K of the PoA-DD is adequate to confirm the all necessary requirements of PoA. • The supporting evidence proposed to confirm the respective eligibility are verified and found to be appropriate for the criteria. • All the necessary requirements of the para 124 of the CDM project standard for programmes of activities, version 2 has been fulfilled. 		

SECTION E. Internal quality control

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The validation report prepared by team leader is reviewed by an independent technical reviewer (having competence of relevant technical area himself/herself or through an independent technical area expert) to confirm the internal procedures established by 4KES are duly followed and the validation report/opinion is reached in an objective manner and complies with the applicable CDM requirements.

The technical review team is collectively required to possess the technical expertise of all the technical area/sectoral scope the project activity relates to. All team members of technical review team are independent of the validation team. The independent technical reviewer(s) may approve or reject the draft validation report. The findings may be identified even at this stage, which needs to be satisfactorily resolved, before submit final report to UNFCCC. The final approval decision is taken by the Head of the DOE/Director.

The final decision is authorized by the Director, 4KES, once the report is finalized by the Head of the DOE/DOE Manager.

SECTION F. Validation opinion

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4K Earth Science Pvt. Ltd has been contracted by 'Nuotech Solar Systems Pvt. Ltd' to perform a validation of the CDM registered PoA 'Solar Water Heater Program in India' (UNFCCC Ref #8855) in India for renewal of PoA period.

The validation was performed in accordance with the UNFCCC criteria for the Clean Development Mechanism, latest version of Validation and Verification Standard and related Standards/Guidance and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting. In our opinion, the project meets all relevant UNFCCC, CDM criteria and all relevant host country criteria.

The review of the final PoA-DD and the subsequently performed follow-up interviews with representatives of the project participant has provided the validation team with sufficient evidence to determine the validity of the original baseline and/or its update. The PoA design document correctly applies small scale methodology AMS-I.C. Version 21.0. It is demonstrated that the project baseline scenario is not changed and also all necessary parameters are updated correctly for the 2nd crediting period.

The monitoring plan provides for the monitoring of the CPAs emission reductions. The monitoring arrangements described in the monitoring plan are feasible within the program design, and it is the validation team's opinion that the CME and CPA implementer are able to implement the monitoring plan.

The eligibility criteria for inclusion of CPA have been correctly updated which confirms all the relevant requirements of the PoA and CDM Project standard for PoA, version 2.

In summary, it is validation team's opinion that the CDM program of activity 'Solar Water Heater Program in India' (UNFCCC Ref #8855) in India meets all relevant UNFCCC requirements for the renewal of the PoA period. Hence 4KES requests the renewal of the PoA period of the program.

Appendix 1. Abbreviations

Abbreviations	Full texts
4KES	4K Earth Science Private Limited
AMS	Approved Methodology for Small-scale
BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CL	Clarification request
CME	Coordinating/ Managing Entity
CPA	Component of the Project Activity
CPAI	Component of the Project Activity Implementer
CO ₂	Carbon dioxide
COP	Conference of Parties
DOE	Designated Operational Entity
DNA	Designated National Authority
DR	Document Review
EB	Executive Board
EF	Emission Factor
ERs	Emission Reductions
ETC	Evacuated Tube Collector
FPC	Flat Plate Collector
SWH	Electric Water Heater
FAR	Forward Action Request
FCN	Fair Climate Network
GHG	Greenhouse gas(es)
HCA	Host Country Approval
IPCC	Intergovernmental Panel on Climate Change
KP	Kyoto Protocol
LSC	Local Stakeholder Consultation
LE	Leakage Emissions
LoA	Letter of Approval/Authorization
ISO	International Organization for Standardization
MNRE	Ministry of New & Renewable Energy
MOP	Meeting of Parties
MoC	Modalities of Communication
MoV	Means of Verification
MP	Monitoring Plan
NCV	Net Calorific Value
ODA	Official Development Assistance
PA	Project Activity
PoA	Program of Activity
DD	Design Document
PE	Project Emissions
PP	Project Participant
PS	Project Standard
PCP	Project Cycle Procedure
QA/QC	Quality Assurance/Quality Control
RfR	Request for Registration
SSC	Small Scale
SWH	Solar Water Heater
T&C	Technical & Certification
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation & Verification Standard

Appendix 2. Competence of team members and technical reviewers

<u>Certificate of Competence</u>						
Name	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Ma Paa Puratchikkanal				
Qualification Procedure	Fulfil the requirement as per the appointment of personnel procedure of 4KES for Validation and Verification of CDM/VCS/GS/GHG Projects.					
Appointed to work as:						
	CDM Validator/Verifier	Team Leader	Team Member	Technical Expert	Technical Reviewer	Financial Expert
Appointed	Yes	Yes	Yes	Yes	Yes	No
Appointed Date	29-07-2019					
Authorized to work as Technical Expert for:						
Authorized Technical Area	Sectoral Scope		TA Code	Technical Area within the scope		
	Energy industries (renewable - / non-renewable sources)		1.1	Thermal energy generation		
	Energy industries (renewable - / non-renewable sources)		1.2	Renewables		
	Energy demand		3.1	Energy demand		
	Construction		6.1	Construction		
	Waste handling and disposal		13.1	Solid waste and wastewater		
	Agriculture		15.1	Agriculture		
Authorized to work as Local Expert for:						
Country/Countries	India					
Compliance check by: Anand S. R.						

<u>Certificate of Competence</u>						
Name	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Narendra Kumar .R				
Qualification Procedure	Fulfil the requirement as per the appointment of personnel procedure of 4KES for Validation and Verification of CDM/VCS/GS/GHG Projects.					
Appointed to work as:						
	CDM Validator/Verifier	Team Leader	Team Member	Technical Expert	Technical Reviewer	Financial Expert
Appointed	Yes	Yes	Yes	Yes	Yes	No
Appointed Date	29-07-2019					
Authorized to work as Technical Expert for:						
Authorized Technical Area	Sectoral Scope		TA Code	Technical Area within the scope		
	Energy industries (renewable - / non-renewable sources)		1.1	Thermal energy generation		
	Energy industries (renewable - / non-renewable sources)		1.2	Renewables		
	Energy demand		3.1	Energy demand		
	Waste handling and disposal		13.1	Solid waste and wastewater		

Authorized to work as Local Expert for:			
Country/Countries	India		
Compliance check by: Anand S. R.			

<u>Certificate of Competence</u>						
Name	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Anand S.R				
Qualification Procedure	Fulfils the requirement as per the appointment of personnel procedure of 4KES for Validation and Verification of CDM/VCS/GS/GHG Projects.					
Appointed to work as:						
	CDM Validator/Verifier	Team Leader	Team Member	Technical Expert	Technical Reviewer	Financial Expert
Appointed	No	No	Yes	No	No	No
Appointed Date	29-07-2019					
Authorized to work as Technical Expert for:						
Authorized Technical Area						
Authorized to work as Local Expert for:						
Country/Countries	India					
Compliance check by: R. Narendra Kumar						

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	Nuetech	PoA Design Document	Version 08, dated 05/09/2019	Nuetech
	Nuetech	Revised PoA Design Document	Version 09, dated 12/11/2019	Nuetech
	Nuetech	Revised PoA Design Document	Version 10, dated 04/12/2019	Nuetech
	Nuetech	Revised PoA Design Document	Version 11, dated 12/02/2020	Nuetech
2	UNFCCC	UNFCCC PoA page	CDM Ref # 8855	Nuetech
3	Nuetech	Registered PoA-DD (Latest)	Version 07, dated 29/08/2016	Publically available
4	SQS	Validation Report (of initial registration)	Dated 31/12/2012	Publically available
5	Nuetech	Latest Modalities of communication		Publically available
6	UNFCCC	AMS.I.C – “Switch from Non-Renewable Biomass for Thermal Applications by the User”	Version 21	Publically available
7	IPCC	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book	Web Link	Publically available
8	UNFCCC	Kyoto Protocol (1997)	Web Link	Publically available
9	UNFCCC	Programme of activities design document form	Version 09	Publically available
10	UNFCCC	CDM Project Standard for programmes of activities	Version 02	Publically available
11	UNFCCC	Standard: Sampling and surveys for CDM project activities and programme of activities	Version 07	Publically available
	UNFCCC	Guidelines for sampling and surveys for CDM project activities and programme of activities	Version 04	Publically available
12	UNFCCC	CDM Validation and Verification Standard for programmes of activities	Version 02	Publically available
13	UNFCCC	Glossary “CDM terms”	Version 10	Publically available
14	UNFCCC	Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period	Version 3.0.1	Publically available

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

Table 1. CL from this validation

CL ID	01	Section no.	D.2.4	Date: 07/11/2019
Description of CL				
Few parameters in PoA-DD that needs to be monitored as per the methodology are considered as fixed parameters. Clarification is sought.				
<ul style="list-style-type: none"> The parameter $EG_{thermal, CAT II, y}$ is monitored by measuring the flow of hot water and temperature difference of the cold & hot water. So, the volume of hot water for the category II system is measured using BTU meter. However, the parameter volume of hot water for the category II system ($V_{catII, n}$) is also mentioned under fixed parameters. The parameter $EF_{grid, y}$ is a monitoring parameter but the same is also considered in the fixed parameters. 				
Project participant response				Date: 12/11/2019
<p>Let us respond to the two bullets separately:</p> <ul style="list-style-type: none"> The parameter $V_{catII, n}$ has been removed from section I.6.2. 'Data and parameters fixed ex ante'. This parameter is indeed already covered by the monitoring parameter $EG_{thermal, CAT II, y}$. The fixed parameter $EF_{grid, y}$ is indeed a monitoring parameter. It appeared in the fixed parameters since it is an important value in the ex ante calculations. The fixed parameter has been deleted and the ex ante value has been added to the equivalent monitoring parameter. For the ex ante calculations latest CO₂ emission factor of the Indian grid has been used. Since this is the 2nd crediting period, wOM=0.25 and wBM= 0.75 has been applied, following TOOL07 Methodological tool: Tool to calculate the emission factor for an electricity system Version 07.0, paragraph 86. 				
Documentation provided by project participant				
PoA-DD, dated 7 October, section I.6.2.				
Spreadsheets: 2017-18 Emission Factor Version 14				
DOE assessment				Date: 15/11/2019
<ul style="list-style-type: none"> The parameter $V_{catII, n}$ is now removed from the fixed parameter list. Hence Ok. The parameter $EF_{grid, y}$ is removed from the fixed parameter list. Hence Ok 				
CL is closed				

CL ID	02	Section no.	D.2.4	Date: 07/11/2019
Description of CL				
<p>As per methodology, the parameter $EG_{thermal, y}$ should be determined "...as the difference of the enthalpy of the steam or hot fluid and/or gases generated by the heat generation equipment and the sum of the enthalpies of the feed-fluid and/or gases blow-down and if applicable any condensate returns. The respective enthalpies should be determined based on the <u>mass (or volume) flows, the temperatures</u> and, in case of superheated steam, the pressure."</p> <p>But for the category I solar water heating systems, the mass flow and the temperature are not monitored but fixed ex-ante. This is a deviation from the methodology. Clarification is sought.</p>				
Project participant response				Date: 12/11/2019
<p>Category I systems are an exception to this rule. The methodology stipulates in paragraph 82, the first parameters that "In the case of household or commercial applications/systems, whose maximum output capacity is less than 45 kW thermal and where it can be demonstrated that the metering of thermal energy output is not plausible."</p> <p>The guidance which applies to systems with a capacity below 45 kW thermal has been applied to category I systems.</p>				
Documentation provided by project participant				
PoA-DD, dated 7 October, section I.6.2.				
DOE assessment				Date: 15/11/2019

As per the Data / Parameter table 1 of para 82 in the methodology, In the case of household or commercial applications/systems, whose maximum output capacity is less than 45 kW thermal and where it can be demonstrated that the metering of thermal energy output is not plausible and monitor number of operating days of the system instead. Since the SWH Category I system capacity is less than 45 kW thermal, PP monitors the operating days of the system. Hence, no requirement of monitoring $EG_{thermal,y}$ for category I system.

CL is closed.

CL ID	03	Section no.	D.2.4	Date: 07/11/2019
Description of CL				
Under Section I.7.2 of PoA-DD, it is mentioned that 'The number of systems operating' is a monitoring parameter. But the same is considered under fixed parameters table under I.7.1. Clarify				
Project participant response				Date: 12/11/2019
<p><i>The methodology AMS-I.C, v21, para 82 refers to monitoring the continuous operation of the systems. To systems smaller than 45 kW thermal, an exception applies. For these systems, survey methods can be used to determine the number of systems operating, and the annual hours of operation. In the PoA-DD, parameter D is mentioned under section I.7.1 and elaborated in the sampling plan in section I.7.2 of the PoA-DD. Although the methodology refers to a single monitoring parameter with two elements (paragraph 82, 1st parameter), the amended PoA-DD now specify two separate parameters:</i></p> <ol style="list-style-type: none"> <i>1. Number of operational days in year y</i> <i>2. Share of systems confirmed to be operational</i> 				
Documentation provided by project participant				
<i>PoA-DD, dated 7 October</i>				
DOE assessment				Date: 15/11/2019
PP now included the share of operating system as monitoring parameter. Hence, OK.				
CL is closed.				

CL ID	04	Section no.		Date: 07/11/2019
Description of CL				
PP is requested to clarify the mechanisms put it place to avoid double counting of project equipments. In particular, clarify unique numbering system proposed for each solar water heater to be installed under PoA				
Project participant response				Date: 12/11/2019
<p><i>Each SWH in the SSC-CPA shall be uniquely identified and defined in an unambiguous manner by providing the address, and/or the system serial number of the collectors installed at each location.</i></p> <p><i>The address and serial numbers should be collected at completion of the sales agreement and invoice and entered into the centralised database. Data entry for serial numbers can easily be checked for repetition by ranking on serial numbers.</i></p> <p><i>For each SWH there are either address or serial numbers included in the database. Nuotech is in the process of renovating unique serial numbers which have become less readable over the years.</i></p>				
Documentation provided by project participant				
DOE assessment				Date: 15/11/2019
<p>The unique numbering system explained by CME has been verified by validation team during the site visit. During site visit, address & serial number given in the database has been cross verified by physically inspecting the solar water heating system randomly. During the interview with CME, the CME confirmed that Nuotech will rewrite the serial number in the SWH systems which have become less readable. Hence, verification confirms the mechanisms to avoid double counting that put in place by CME is adequate.</p>				
CL is closed.				

Table 2. CAR from this validation

CAR ID	01	Section no.	-	Date: 07/11/2019
Description of CAR				
The information regarding the different category of Solar water heating system is not clear in the PoA-DD. Several places in the PoA-DD the Category I & Category II SWH systems are referred. But these categories are not defined anywhere in the PoA-DD.				
Project participant response				Date: 12/11/2019

<i>That is correct. This explanatory section has accidentally been removed when transposing the PoA-DD to the latest UNFCCC template.</i>	
<i>The two categories were introduced in section "A.4.4.2. Monitoring plan" of the previous version of the PoA-DD. We have resolved this by adding an explanation to section "I.6.1. Explanation of methodological choices" (page 23 of the PoA-DD), bullets 4 and 5.</i>	
Documentation provided by project participant	
<i>PoA-DD, dated 7 October, section I.6.2.</i>	
DOE assessment	Date: 15/11/2019
The definition of both category I & category II system are now included in section I.6.1. & B.4.1. CAR is closed.	

CAR ID	02	Section no.	D.2.1	Date: 07/11/2019
Description of CAR				
Latest version of methodology and tools are not referred in the PoA-DD. <ul style="list-style-type: none"> Under the fixed parameter table of η_{EWH}, AMS I.C Version 12 is referred which is not a valid version. Under the monitoring parameter table of $EF_{grid,y}$, Tool to calculate emission factor for electricity systems, version 02 is referred which is not a valid version. 				
Project participant response				Date: 12/11/2019
<i>These are omissions and both have been corrected.</i>				
Documentation provided by project participant				
<i>PoA-DD, dated 7 October, section I.7.1.</i>				
DOE assessment				Date: 15/11/2019
<ul style="list-style-type: none"> The reference to the AMS I.C version 12 has been updated to AMS I.C version 21. Also the Tool to calculate emission factor for electricity systems, version 02 has been updated to version 07. 				
CAR is closed				

CAR ID	03	Section no.	D.2.4	Date: 07/11/2019
Description of CAR				
Monitoring frequency of the parameter $EC_{PJ,n,y}$ is not in line with the applied Tool 05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (Version 3) requirements. <ul style="list-style-type: none"> Monitoring frequency is not mentioned in the PoA-DD The recording frequency considered in the PoA-DD is yearly; but as per the Tool 05, the minimum required monitoring frequency is every month. 				
Project participant response				Date: 12/11/2019
<i>The description of the monitoring frequency has been corrected as Continuous measurement and at least monthly recording, reflecting the requirements of Tool 05, version 03.0.</i>				
Documentation provided by project participant				
<i>PoA-DD, dated 7 October, section I.7.1.</i>				
DOE assessment				Date: 15/11/2019
The monitoring and recording frequency of the parameter $EC_{PJ,n,y}$ is now changed to Continuous measurement and at least monthly recording. This is found to be in line with the Tool 05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (Version 3) requirements. CAR is closed				

Table 3. FAR from this validation

FAR ID	xx	Section no.		Date: DD/MM/YYYY
Description of FAR				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
02.0	31 May 2019	Revision to: <ul style="list-style-type: none">• Ensure consistency with version 02.0 of the “CDM validation and verification standard for programmes of activities” (CDM-EB93-A08-STAN) and version 02.0 of the “CDM project cycle procedure for programmes of activities” (CDM-EB93-A09-PROC);• Make editorial improvements.
01.0	29 December 2017	Initial publication.

Decision Class: Regulatory
Document Type: Form
Business Function: Renewal of crediting period
Keywords: crediting period, programme of activities, validation report
