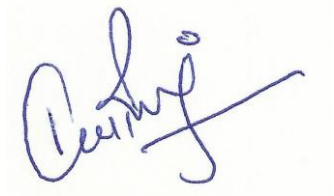
Verification and certification report form for CDM project activities

(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 project activity	Wind Power Project by National Enterprises at Tamil Nadu, India UNFCCC Reference Number: 5678		
Scale of the project activity	☐ Large-scale ☒ Small-scale		
Version number of the verification and certification report	2.0		
Completion date of the verification and certification report	12/11/2021		
Monitoring period number and duration of this monitoring period	2nd, 11/01/2013 to 31/12/2020 (inclusive of both days)		
Version number of the monitoring report to which this report applies	02		
Crediting period of the project activity corresponding to this monitoring period	13/01/2012 to 12/01/2022 (Fixed)		
Project participants	M/s National Enterprises		
Host Party	India		
Applied methodologies and standardized baselines	AMS-I.D "Grid connected renewable electricity generation" (EB 61, Version 17) Standardized baseline: Not applicable		
Mandatory sectoral scopes	01 - Energy industries (renewable / non-renewable sources)		
Conditional sectoral scopes, if applicable	NA		
Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD	54,394 tCO_2e		
Certified amount of GHG emission reductions or GHG removals for this monitoring period	Amount before 1 January 2013	Amount from 1 January 2013 until 31 December 2020	Amount from 1 January 2021
	0 tCO_2e	37,182 tCO_2e	0 tCO_2e
Name and UNFCCC reference number of the DOE	Earthood Services Private Limited E-0066		

Name, position and signature of the approver of the verification and certification report	 Dr. Kaviraj Singh Managing Director

SECTION A. Executive summary

The main purpose of this project activity is to generate clean form of electricity through renewable wind energy source. M/s National Enterprises is the promoter of the project activity and has commissioned a wind power project of total capacity 3 MW. The project activity envisaged two number of WTG of capacity 1.5 MW each and both located at village balapathiraramapuram, VK Puthur tehsil, Tiruneveli district, Tamil Nadu. The project activity uses wind resource to generate electricity that is being fed to the Indian Grid through the nearest grid substation.

Project is operational, and the assessment team verified this during the site visit. The assessment team confirms that the total emission reduction achieved under this monitoring period 11/01/2013 to 31/12/2020 (including both days) is 37,182 tCO_2e.

Scope of verification

The scope of the verification was limited to the monitoring period covered under the current monitoring period 11/01/2013 to 31/12/2020 of the registered CDM PA "*Wind Power Project by National Enterprises at Tamil Nadu, India*" to determine whether;

The project activity has been implemented and operated as per the registered PDD or any approved revised PDD, and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;

The monitoring report and other supporting documents provided are complete in accordance with the latest applicable version of the completeness checklist for requests for issuance of CERs, verifiable, and in accordance with applicable CDM requirements;

The actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan, any registered monitoring plan, the approved methodology including applicable tool(s) and/or, where applicable, the approved standardized baseline;

The data recorded and stored as per the monitoring methodology including applicable tool(s) and, where applicable, the standardized baseline.

Verification process

The verification process involved following;

- Publication of monitoring report
- Desk review
- Remote Audit
- Issuance of verification findings
- Reporting, calculation checks, QA/QC and resolution of findings
- Issuance of draft verification report
- Independent technical review of the project documentation
- Issuance of the final verification report
- Submission of the request for issuance, as appropriate

Conclusion

ESPL has performed the verification of the CDM PA "Wind Power Project by National Enterprises at Tamil Nadu, India" having UNFCCC Ref. Number 5678[1] for the monitoring period 11/01/2013 to 31/12/2020. The verified emission reductions amount to 37,182 tCO_2e in the aforesaid monitoring period.

The verification concluded that the registered CDM PA complies with all relevant CDM procedures/standards/guidance and therefore request for issuance is being submitted in accordance with the CDM procedures.

[1] https://cdm.unfccc.int/Projects/DB/RINA1326467420.68/view

SECTION B. Verification team, technical reviewer and approver

B.1. Verification 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	Interviews	Verification findings
1.	Team Leader	EI	Takarkhede	Atul	Central Office	Y	Y	Y	Y
2.	Technical Expert (TA1.2)	EI	Takarkhede	Atul	Central Office	Y	Y	Y	Y
3.	Methodology Expert	EI	Takarkhede	Atul	Central Office	Y	Y	Y	Y
4.	Local Expert	EI	Takarkhede	Atul	Central Office	Y	Y	Y	Y
5.	Verifier	EI	Takarkhede	Atul	Central Office	Y	Y	Y	Y

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 DOE or outsourced entity)
1.	Technical reviewer	IR	Garg	Shreya	Central Office
2.	TA expert to TR	IR	Garg	Shreya	Central Office
3.	Approver	IR	Singh	Kaviraj	Central Office

SECTION C. Application of materiality

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 in recording monitored data in JMR sheets	Low	The reading of JMR is being recorded in the presence of representatives of State Electricity Board and O&M contractor. Hence, it is highly unlikely of occurrence of human error while recording the readings.	The practice on site for recording data was confirmed from the responsible team members for compliance with the standard procedure. The JMR data (State Energy Account)/09/ for the project activity was cross checked against the daily generation readings/9//Invoices/10/.
2.	Transfer of recorded data to break up sheets and invoices	Low	A dedicated Team is appointed for transfer of recorded data and calculations related to generation by each Feeder. These calculations are performed in excel templates which have adequate control measures to prevent any manual or calculation	The practice on site for data transfer was confirmed from the responsible team members for compliance with the standard procedure.

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	
			error. These sheets are further reviewed for errors by the Electricity Board.	
3.	Error in transferring the recorded data to ER sheet	Medium	The procedure for transferring the recorded break-up sheet readings to the spreadsheet is manual in nature thus increasing the chances of error. However, PP has Implemented internal quality checks to ensure prevention of any such potential error in the prepared ER sheet/7/.	All the monthly reported values in ER sheet/7/ were verified with JMR & daily generation data recorded at the plant/9/.
4.	Human error: Quantification of emission reduction	Low	Use of spread-sheets without adequate data control, changes/updates, version tracking, traceability and security	All the Monthly Electricity Generation Reports for the complete monitoring period/9/ are checked and thus the assessment team confirms that the ER value is conservative and correct/7/.

C.2. Consideration of materiality in conducting the verification

In accordance with CDM Validation and Verification Standard for project activities, Version 03, para 326 the prescribed thresholds for materiality for CDM PAs are as under;

Emission Reductions (tCO_2e)/year	500,000 or more	300,001 to 499,999	300,000 or less	Small Scale CDM PAs	Micro Scale CDM PAs
Materiality Threshold (para 326)	0.5%	1.0%	2.0%	5.0%	10.0%

The applicable materiality threshold is 5% as project activity.

Particulars / Monitoring Report	MR Version (Public)	MR Version (Revised/Final)[2]
Emission Reductions Achieved (tCO2e) in this monitoring period	35,747 tCO_2e	37,182 tCO_2e
Applicable Threshold (%) as per para 326(c) of CDM VVS for PAs Version 03.0	5.0%	5.0%

The verification team has identified the impact of errors observed and those were corrected by PP during verification for all monitoring parameters at the individual level. The extrapolated impact on ERs is also provided for parameters individually and in an aggregated manner in the end.

Monitored Parameter (Symbol / Description)	Reporting Frequency	Number of Discrete Data (Total)	Sample selected for verification	Type of error identified	Impact on ERs
Net Electricity supplied to Southern	Monthly	96 (100%)	96 (100%)	JMR values for the months of May-December 2020 was found inconsistent.	100% monthly JMR checked for export & import values and final ER sheet found correct

[2] In the published MR, the ERs were calculated applying the 0.5% error to address delay in calibration throughout monitoring period, however same was revised inline with calibrations carried out & meter change during monitoring period. Further, electricity data for the period of May to December 2020 have been added which was missing during MR webhosting. Hence, the ERs in the final MR are changed.

Monitored Parameter (Symbol / Description)	Reporting Frequency	Number of Discrete Data (Total)	Sample selected for verification	Type of error identified	Impact on ERs
Regional Grid; $EG_{BL,y}$				Thus, Final MR & ER sheet was revised for monthly export & import values for these months.	for export & import values, however, ERs increased due correction of electricity data for the period of May to December 2020 which was missing during MR webhosting. Further, slight change in ERs occurred due to application of error factor for export/import values due to delayed calibrations.
$EG_{export,y}$	Monthly	96 (100%)	96 (100%)		
$EG_{import,y}$	Monthly	96 (100%)	96 (100%)		

Based on the above table it can be confirmed that the applicable materiality threshold is not breached for the registered PA as CDM Validation and Verification Standard for project activities, Version 03. A complete set of data were verified and no errors were identified during the verification of data from their respective source.

SECTION D. Means of verification

D.1. Desk/document review

Earthood conducted a desk review as under;

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

In addition to the monitoring documentation, Earthood has reviewed;

- The registered PDD, Version 06 dated 14/10/2011 and the monitoring plan, including any approved revised monitoring plan and/or changes from the registered PDD, and the corresponding validation opinion;
- The Validation Report Version 1.1 dated 21/11/2011;
- The applied monitoring methodology (AMS-I. D "Grid connected renewable electricity generation" (EB 61, Version 17));
- The monitoring report (all versions) to verify that it is as per the standardized format;
- Any other information and references relevant to the project activity's emission reductions (e.g., IPCC reports, data on electricity generation in the national grid or laboratory analysis/calibration and national regulations).

The complete list of documents reviewed is included under Appendix 3.

D.2. On-site inspection

Duration of on-site inspection: 28/08/2021				
No.	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.	An assessment of the implementation and operation of the registered project activity as per the registered PDD or any approved revised PDD;	Village Balapathiraram apuram, Tehsil V K Puthur, Tirunelveli District, Tamil	28/08/2021	Dr. Atul Takarkhede
2.	A review of information flows for generating, aggregating and reporting the			

Duration of on-site inspection: 28/08/2021				
No.	**Activity performed on-site**	**Site location**	**Date**	**Team member**
	monitoring parameters; Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the PDD;	Nadu State, India		
3.	A cross check between information provided in the monitoring report and data from other sources such as plant logbooks, inventories, purchase records or similar data sources;			
4.	A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PDD, the applied methodology including applicable tool(s), and, where applicable, the applied standardized baseline;			
5.	A review of calculations and assumptions made in determining the GHG data and emission reductions;			
6.	An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters			

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Raja	Mr. B.D.	PP representative	28/08/2021	Project implementation, ER calculation, monitoring plan, Operation and maintenance Procedures, Substation monitoring & metering arrangement, Calibration, JMR etc.	Dr. Atul Takarkhede
2.	Saurabh	Mr. Sumant	EKI Energy Services Ltd.		MR, ER calculations etc.	

D.4. Sampling approach

No sampling approach was followed by the assessment team. All reported figures in the MR/6/ and ER sheet/7/ were checked from the actual records.

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

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form	-	CAR#01	-
Compliance of the project implementation and operation	CL#01	CAR #02	-

with the registered PDD			
Post-registration changes	-	-	-
Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines	-	-	-
Compliance of monitoring activities with the registered monitoring plan	-	CAR #03	-
Compliance with the calibration frequency requirements for measuring instruments	-	CAR#04	-
Assessment of data and calculation of emission reductions or net removals	-	CAR#05	-
Assessment of reported sustainable development co-benefits	-	-	-
Global stakeholder consultation	-	-	-
Others (please specify)	-	-	-
Total	**01**	**05**	**00**

SECTION E. Verification findings

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

Means of verification	The monitoring report form used is CDM-MR-FORM version 9.0/13/ which was the appropriate form and the latest version available at the time of verification, as verified through UNFCCC webpage.
Findings	CAR#01 was raised and resolved.
Conclusion	All the sections of the form were filled as per the guidelines to complete UNFCCC CDM MR template version 09 and gave all the relevant details. CAR#01 was raised to solve inconsistency between MR/6/ and CDM MR template. Same was rectified by PP in revised MR submitted. The MR was web hosted in version 08.0 of the MR form which was the current and active version in the UN platform at the time of webhosting. However, during course of verification, the monitoring report template have been revised by UNFCCC and thus it has been prepared as per the instructions provided in the latest template i.e. version 09.0. The revised final monitoring report/6/ was found to be in compliance with the applicable latest monitoring report form and instructions therein/13/.

E.2. Remaining forward action requests from validation and/or previous verifications

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This is second verification of the project activity and there are no open FARs from validation & previous verification . FAR raised during validation was closed during first verification/02/.

E.3. Compliance of the project implementation and operation with the registered project design document

Means of verification	Site visit was carried out by the verification team to check the implementation status of the project activity and the instrumentation installed for the project activity. The commissioning date of the Wind Power plant was verified from the commissioning certificates/8/ and found that commissioning dates of project activity is 30/05/2009. Through validation report/2/ and Power Purchase Agreement/18/ it was confirmed that PP is in agreement with Tamil Nadu Electricity Board (TNEB) for the selling electricity through the grid. The verified geographical coordinates of the Wind Power plant have been mentioned below. The same were checked during on-site inspection by using a hand-held GPS instrument.

WTG ID / HTSC No.	Latitude	Longitude	Commissioning date

TDA 74 / 2849	77^0 33' 23.3"	9^0 03' 26.9"	30/05/2009
TDA 76 / 2848	77^0 34' 37.8"	9^0 02'11.6"	

The locations of WTGs were verified against geo-locations of the plant given in the registered PDD/1/ & Google earth.

The installation and specification of the WTGs installed were checked with the commissioning certificate/8/, name-plates and PP interviews/18/.

The Technical specifications of installed WTGs 1500 KW (S 82) manufactured by Suzlon Energy Limited are as below:

Features of WTG		
Sl.No.	**Particulars**	**Specifications**
Rotor		
1.	Rotor diameter	82 m
2.	Hub Height	78.5 m
3.	Installed electrical output	1500 kW
4.	Rotor swept area	5281 m^2
5.	Regulation	Pitch regulated
Operational Data		
6.	Cut-in wind speed	4 m/s
7.	Rated wind speed	14 m/s
8.	Cut-out wind speed	20 m/s
Generator		
9.	Type	Asynchronous Generator, 4 poles
10.	Rated output	1500 kW
11.	Rotational speed	1511 rpm
12.	Rated voltage	690 V
13.	Frequency	50 Hz
14.	Insulation class	H
15.	Cooling system	Air cooled
16.	Enclosure Class	IP 54
Gear Box		
17.	Type	Integrated 3-stage gearbox, 1 planetary & 2 helical.
18.	Gear ratio	1:95.09
19.	Nominal load	1650 kW
20.	Type of cooling	Oil cooling, forced lubrication
Yaw Drive		
21.	Yaw drive system	Active electrical yaw motors
22.	Yaw bearing	Polyamide slide bearing
Operating Breaks		
23.	Aerodynamic brake	3 independent systems with blade pitching
24.	Mechanical brake	Hydraulic disc brakes

The single line diagram available at the sub-station and the interviews with the site engineers confirmed that the configuration of the project activity and the location of monitoring instruments is in accordance with the description provided in the registered PDD/1/.

Interviews of the personnel were conducted by the verification team, which revealed that all the QA/QC procedures listed in the registered PDD/1/ have been followed while operating the project activity.

As per para 34 of CDM project standard for project activities, version 3.0/4/, project activity is type-I activity of small scale. The emission reduction achieved in this monitoring period are 37,182 tCO_2e/6/, against the estimated ERs – 54,394 tCO_2e as per approved PDD/1/.

	The monitoring and metering system, and its compliance with the monitoring plan has been discussed in later sections of the report The information relating to the project implementation, provided in the Monitoring Report/6/ is consistent with that stated in the registered PDD/1/. The data and variables provided in the monitoring report are the same as stated in the registered PDD/1/.
Findings	CAR#02 and CL#01 was raised and resolved.
Conclusion	DOE, inline to para 354-356 of CDM Validation and Verification Standard for project activities, Version 03/5/, confirms that: • Implementation and operation of project activity has been conducted in accordance with the description contained in registered PDD/1/. • Physical features of the registered project activity specified in registered PDD/1/ are in place and PP have operated the project activity as per the registered PDD/1/. The emission reductions achieved during the current monitoring period are 37,182 tCO_2e which is lower than the estimated ERs as per registered PDD/1/ 54,394 tCO_2e.

E.4. Post-registration changes

E.4.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents[3]

Not applicable for present Monitoring period. Also, no deviations were taken before current monitoring period

E.4.2. Corrections

Not applicable for present Monitoring period.

E.4.3. Changes to the start date of the crediting period

Not applicable for present Monitoring period

E.4.4. Inclusion of a monitoring plan

Not applicable for present Monitoring period.

E.4.5. Permanent changes from registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other methodological regulatory documents

Not applicable for present Monitoring period.

E.4.6. Changes to the project design

Not applicable for present Monitoring period.

E.4.7. Changes specific to afforestation and reforestation project activities

Not Applicable.

E.5. Compliance of the registered monitoring plan with applied methodologies, applied standardized baselines, and other applied methodological regulatory documents

Means of verification	The review of applied methodology AMS-I.D "Grid connected renewable electricity generation" (EB 61, Version 17)/3/ and approved monitoring plan establishes that the plan is consistent with the applied methodology/3/. Based on this review it was

[3] Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

	found the monitoring plan includes all the required parameters to be monitored in the context of project design and description and allows proper determination of emission reductions in accordance with the applied methodology/3/.
Findings	No CAR/CL has been raised.
Conclusion	The approved monitoring plan is in accordance with the applied methodology/3/ and correctly applied by the registered CDM project activity.

E.6. Compliance of monitoring activities with the registered monitoring plan

E.6.1. Data and parameters fixed ex ante or at renewal of crediting period

Means of verification

The values considered ex-ante for this monitoring period were cross-checked with registered PDD/1/ and their respective sources. The summary of all the ex-ante parameters has been given below:

Parameter/ Description	Value applied	MoV
Simple operating margin emission factor (inclusive of imports) - $\mathbf{EF_{grid,OM,y}}$	0.9871 tCO_2/MWh	The value of the parameter was checked from registered PDD/1/. The value of the parameter was sourced from CEA database version 05/14/.
Build margin emission factor- $\mathbf{EF_{grid,BM,y}}$	0.8179 tCO_2/MWh	The value of the parameter was checked from registered PDD/1/. The value of the parameter was sourced from CEA database version 05/14/.
Combined margin emission factor- $\mathbf{EF_{grid,CM,y}}$ (for Southern Regional Grid)	0.9448 tCO_2/MWh	The value of the parameter was checked from registered PDD/1/. The value of the parameter was sourced from CEA database version 05/14/.

Findings	No CAR/CL has been raised.
Conclusion	The value in the monitoring report/6/ and corresponding emission reduction calculations spreadsheet/7/ are consistent with the registered PDD/1/. The applied value is correct and justified.

E.6.2. Data and parameters monitored

Means of verification

Net Electricity supplied to Southern Regional Grid; $\mathbf{EG_{BL,y}}$

Measuring/Reading/Recording Frequency	Calculated continuously and recorded monthly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes, the monitoring frequency is in accordance to the monitoring plan/1/ and monitoring methodology/3/.
Monitoring equipment	The parameter is monitored with an energy meter. Details of monitoring meters are provided in Appendix 5 of the report.
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Accuracy class of the equipment is 0.2s, which is in line with the onsite practice. The accuracy class in the registered PDD is 0.5s which is less conservative than the accuracy class of the meter used onsite. Since the meter accuracy increases which results in conservative estimation of

		actual CERs the same is acceptable to the assessment team. The Calibration certificates are therefore checked and assessment team is of the opinion that the same is correct and as per the onsite practice.
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Accuracy class is valid for entire range.
	Calibration frequency /interval:	The meters are calibrated by State Utility/accredited State Utility approved external third parties i.e., Tamil Nadu Generation and Distribution Corporation Limited once in a year/1/. Details of the calibration are provided in FVR Appendix 5 and revised MR/6/.
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Yes
	Is the calibration of measuring equipment carried out by an accredited person or institution?	The meters are calibrated by State Utility/accredited State Utility approved external third parties i.e., Tamil Nadu Generation and Distribution Corporation Limited once in a year/1/. Details of the calibration are provided in FVR Appendix 5 and revised MR/6/.
	Is(are) calibration(s) valid for the whole reporting period?	The calibration dates are presented in appendix 5 of this report. The dates have been checked from the calibration certificates/14/. Meters are periodically calibrated by state utility/14/. Though the calibration frequency is once in a year /6/. As per previous verification report (1st MP), Energy meters (TNU04978 and 04954732) were calibrated till 22/02/2014. Same was confirmed from test certificates dated 23/02/2013 /14/. and the observed percent error for all meters was within the maximum permissible limit of 0.5%. Thus, delayed calibration is addressed in line with para 366 (a) of the "CDM validation and verification standard for project activities, Version 03" by applying maximum permissible error for complete delayed period covering complete months as conservative approach. During current monitoring period, old meters of 0.5 accuracy (S.no. TNU04978 and 04954732) was changed with 0.2s accuracy class

		(S.no. X0369793 and X0369644), in order to ensure more accuracy and efficiently measurement of generated electricity. Assessment team verified same with meter change certificates dated 14/12/2017 issued by TNEB. Meter change from lower to higher accuracy class resulting in the better accuracy. Further, meter installation and accuracy class is not under the control of the PP and governed by state utility/14/,/17/. Thus, during current monitoring period, new installed meter remains calibrated till 13/12/2018. Then delay period observed from 14/12/2018 till 31/12/2020 (Last date of monitoring period). However, recently new meters were tested for the error by state utility on 16/02/2021 and found that error of the new meter is within permissible limit. Same was confirmed from test certificates/14/. PP has submitted records of the meter calibration for the meters/14/ and the observed percent error for all meters was within the maximum permissible limit of 0.2%. Thus, delayed calibration is addressed in line with para 366 (a) of the "CDM validation and verification standard for project activities, Version 03" by applying maximum permissible error for complete delayed period covering complete months as conservative approach. Same was accepted by the assessment team being inline with standard and most conservative approach.
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Yes
	How were the values in the monitoring report verified?	A value of Net Electricity export by the project activity (39,355.291 MWh after application of error for delayed period) for the monitoring period verified from monthly joint meter reading issued by State Utility/9/. Apportioning is carried out by the PP for the generation data of the period 11/01/2013 to 14/02/2013 as start dates of JMR are not matching with start date of monitoring period, based on ratio of daily generation data recorded at the plant of this particular period & the Joint Meter Reading issued by State Utility. The procedure is conservative and hence accepted by verification team. The value was found to be consistently reported in MR/6/ and ER sheet/7/.

If applicable, has the reported data been cross-checked with other available data?	This is calculated parameters. Hence No cross-check mechanism is applicable.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the calibration of the monitoring meters is done by state utility periodically. Check meters also help in verifying main meter readings.
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	No such issues.

$EG_{export,y}$: Total export from the WTG at TNEB meter in a year y

Measuring/Reading/Recording Frequency	Measured continuously and recorded monthly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes, the monitoring frequency is in accordance to the monitoring plan/1/ and monitoring methodology/3/.
Monitoring equipment	The parameter is monitored with a energy meter. Details of monitoring meters are provided in Appendix 5 of the report.
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Accuracy class of the equipment is 0.2s, which is in line with the onsite practice. The accuracy class in the registered PDD is 0.5s which is less conservative than the accuracy class of the meter used onsite. Since the meter accuracy increases which results in conservative estimation of actual CERs the same is acceptable to the assessment team. The Calibration certificates are therefore checked and assessment team is of the opinion that the same is correct and as per the onsite practice.
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Accuracy class is valid for entire range.
Calibration frequency /interval:	The meters are calibrated by State Utility/accredited State Utility approved external third parties i.e., Tamil Nadu Generation and Distribution Corporation Limited once in a year/1/. Details of the calibration are provided in FVR Appendix 5 and revised MR/6/.
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the	Yes

	manufacturer's specifications?	
	Is the calibration of measuring equipment carried out by an accredited person or institution?	The meters are calibrated by State Utility/accredited State Utility approved external third parties i.e., Tamil Nadu Generation and Distribution Corporation Limited once in a year/1/. Details of the calibration are provided in FVR Appendix 5 and revised MR/6/.
	Is(are) calibration(s) valid for the whole reporting period?	The calibration dates are presented in appendix 5 of this report. The dates have been checked from the calibration certificates/14/. Meters are periodically calibrated by state utility/14/. Though the calibration frequency is once in a year /6/. As per previous verification report (1st MP), Energy meters (TNU04978 and 04954732) were calibrated till 22/02/2014. Same was confirmed from test certificates dated 23/02/2013 /14/. and the observed percent error for all meters was within the maximum permissible limit of 0.5%. Thus, delayed calibration is addressed in line with para 366 (a) of the "CDM validation and verification standard for project activities, Version 03" by applying maximum permissible error for complete delayed period covering complete months as conservative approach. During current monitoring period, old meters of 0.5 accuracy (S.no. TNU04978 and 04954732) was changed with 0.2s accuracy class (S.no. X0369793 and X0369644), in order to ensure more accuracy and efficiently measurement of generated electricity. Assessment team verified same with meter change certificates dated 14/12/2017 issued by TNEB. Meter change from lower to higher accuracy class resulting in the better accuracy. Further, meter installation and accuracy class is not under the control of the PP and governed by state utility/14/,/17/. Thus, during current monitoring period, new installed meter remains calibrated till 13/12/2018. Then delay period observed from 14/12/2018 till 31/12/2020 (Last date of monitoring period). However, recently new meters were tested for the error by state utility on 16/02/2021 and found that error of the new meter is within permissible limit. Same was confirmed from test certificates/14/. PP has submitted records of the meter calibration for the

	meters/14/ and the observed percent error for all meters was within the maximum permissible limit of 0.2%. Thus, delayed calibration is addressed in line with para 366 (a) of the "CDM validation and verification standard for project activities, Version 03" by applying maximum permissible error for complete delayed period covering complete months as conservative approach. Same was accepted by the assessment team being inline with standard and most conservative approach.
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Yes
How were the values in the monitoring report verified?	A value of total electricity export from the WTG at TNEB meter (39895.525 MWh after application of error for delayed period) for the monitoring period verified from monthly joint meter reading issued by State Utility/9/. Apportioning is carried out by the PP for the generation data of the period 11/01/2013 to 14/02/2013 as start dates of JMR are not matching with start date of monitoring period, based on ratio of daily generation data recorded at the plant of this particular period & the Joint Meter Reading issued by State Utility. The procedure is conservative and hence accepted by verification team. The value was found to be consistently reported in MR/6/ and ER sheet/7/.
If applicable, has the reported data been cross-checked with other available data?	The readings were cross checked with the monthly bills raised by PP to State Utility and daily generation logbooks maintained at the plant/10/.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the calibration of the monitoring meters is done by state utility periodically. Check meters also help in verifying main meter readings.
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	No such issues.

$EG_{import,y}$: Total import from the WTG at TNEB meter in a year y

Measuring/Reading/Recording Frequency	Measured continuously and recorded monthly
Is measuring and reporting frequency	Yes, the monitoring frequency is in

	in accordance with the monitoring plan and monitoring methodology? (Yes / No)	accordance to the monitoring plan/1/ and monitoring methodology/3/.
	Monitoring equipment	The parameter is monitored with a energy meter. Details of monitoring meters are provided in Appendix 5 of the report.
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Accuracy class of the equipment is 0.2s, which is in line with the onsite practice. The accuracy class in the registered PDD is 0.5s which is less conservative than the accuracy class of the meter used onsite. Since the meter accuracy increases which results in conservative estimation of actual CERs the same is acceptable to the assessment team. The Calibration certificates are therefore checked and assessment team is of the opinion that the same is correct and as per the onsite practice.
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Accuracy class is valid for entire range.
	Calibration frequency /interval:	The meters are calibrated by State Utility/accredited State Utility approved external third parties i.e., Tamil Nadu Generation and Distribution Corporation Limited once in a year/1/. Details of the calibration are provided in FVR Appendix 5 and revised MR/6/.
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Yes
	Is the calibration of measuring equipment carried out by an accredited person or institution?	The meters are calibrated by State Utility/accredited State Utility approved external third parties i.e., Tamil Nadu Generation and Distribution Corporation Limited once in a year/1/. Details of the calibration are provided in FVR Appendix 5 and revised MR/6/.
	Is(are) calibration(s) valid for the whole reporting period?	The calibration dates are presented in appendix 5 of this report. The dates have been checked from the calibration certificates/14/. Meters are periodically calibrated by state utility/14/. Though the calibration frequency is once in a year /6/. As per previous verification report (1st MP), Energy meters (TNU04978 and 04954732) were calibrated till 22/02/2014. Same was confirmed from test certificates dated 23/02/2013 /14/.

		and the observed percent error for all meters was within the maximum permissible limit of 0.5%. Thus, delayed calibration is addressed in line with para 366 (a) of the "CDM validation and verification standard for project activities, Version 03" by applying maximum permissible error for complete delayed period covering complete months as conservative approach. During current monitoring period, old meters of 0.5 accuracy (S.no. TNU04978 and 04954732) was changed with 0.2s accuracy class (S.no. X0369793 and X0369644), in order to ensure more accuracy and efficiently measurement of generated electricity. Assessment team verified same with meter change certificates dated 14/12/2017 issued by TNEB. Meter change from lower to higher accuracy class resulting in the better accuracy. Further, meter installation and accuracy class is not under the control of the PP and governed by state utility/14/,/17/. Thus, during current monitoring period, new installed meter remains calibrated till 13/12/2018. Then delay period observed from 14/12/2018 till 31/12/2020 (Last date of monitoring period). However, recently new meters were tested for the error by state utility on 16/02/2021 and found that error of the new meter is within permissible limit. Same was confirmed from test certificates/14/. PP has submitted records of the meter calibration for the meters/14/ and the observed percent error for all meters was within the maximum permissible limit of 0.2%. Thus, delayed calibration is addressed in line with para 366 (a) of the "CDM validation and verification standard for project activities, Version 03" by applying maximum permissible error for complete delayed period covering complete months as conservative approach. Same was accepted by the assessment team being inline with standard and most conservative approach.
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Yes
	How were the values in the monitoring report verified?	A value of total electricity export from the WTG at TNEB meter (420.283 MWh after application of error for

		delayed period) for the monitoring period verified from monthly joint meter reading issued by State Utility/9/. Apportioning is carried out by the PP for the generation data of the period 11/01/2013 to 14/02/2013 as start dates of JMR are not matching with start date of monitoring period, based on ratio of daily generation data recorded at the plant of this particular period & the Joint Meter Reading issued by State Utility. The procedure is conservative and hence accepted by verification team. The value was found to be consistently reported in MR/6/ and ER sheet/7/.
	If applicable, has the reported data been cross-checked with other available data?	The readings were cross checked with the monthly bills raised by PP to State Utility and daily generation logbooks maintained at the plant/10/.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the calibration of the monitoring meters is done by state utility periodically. Check meters also help in verifying main meter readings.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	No such issues.
Findings	CAR#03 was raised and resolved.	
Conclusion	The DOE confirms that: • The registered monitoring plan has been properly implemented and followed by the project participants • Monitoring of parameter is implemented in accordance with registered monitoring plan/1/. • The equipment used for monitoring the parameter is controlled and calibrated in accordance with registered monitoring plan and applied methodology/3/. • Monitoring results are consistently recorded as per approved frequency. • Quality assurance and quality control procedures have been applied in accordance with the registered monitoring plan/1/.	

E.6.3. Implementation of sampling plan

Means of verification	The verification assessed whether the compliance of the sampling efforts and surveys with the registered sampling plan in accordance with the "Standard for sampling and surveys for CDM project activities and programme of activities" if PP had applied a sampling approach to determine data and parameters monitored.
Findings	There is no CAR/CL raised in this section.
Conclusion	PP did not apply sampling plan to determine data and parameters monitored during this monitoring period. The verification team has checked all the documents such as JMR (Monthly meter) report etc. and hence sampling plan was not required. The verification team hereby confirms that are checked all the documents.

E.7. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	The energy generation is measured through a ABT electronic meters installed at

	the substation. The calibration frequency for meter was set as once in year/1/. However, PP have adopted once in a year calibration frequency for best practice and conservative estimation of the ER achieved/7/. Assessment team accepted the same being conservative. The details of meters and the dates on which calibration has been conducted are given in appendix 5 of this report. The calibration certificates/14/ submitted by the PP confirmed the dates listed in appendix 5 and also revealed that the process has been carried out by State Utility. Calibration and meter arrangement are not in the purview of PP and is controlled by the State Utility. To ensure that the readings were accurate, calibration certificates of all meters were checked and were found satisfactory, however, delay in calibration was observed for the period 15/03/2014 to 13/12/2017 and 11/12/2018 to 31/12/2020. The dates have been checked from the calibration certificates/14/. Meters are periodically calibrated by state utility/14/. PP have adopted once in a year calibration as per the registered PDD/6/. The calibration dates are presented in appendix 5 of this report. The dates have been checked from the calibration certificates/14/. Meters are periodically calibrated by state utility/14/. Though the calibration frequency is once in a year /6/. As per previous verification report (1st MP), Energy meters (TNU04978 and 04954732) were calibrated till 22/02/2014. Same was confirmed from test certificates dated 23/02/2013 /14/ and the observed percent error for all meters was within the maximum permissible limit of 0.5%. Thus, delayed calibration is addressed in line with para 366 (a) of the "CDM validation and verification standard for project activities, Version 03" by applying maximum permissible error for complete delayed period covering complete months as conservative approach. During current monitoring period, old meters of 0.5 accuracy (S.no. TNU04978 and 04954732) was changed with 0.2s accuracy class (S.no. X0369793 and X0369644), in order to ensure more accuracy and efficiently measurement of generated electricity. Assessment team verified same with meter change certificates dated 14/12/2017 issued by TNEB/14/. Meter change from lower to higher accuracy class resulting in the better accuracy. Further, meter installation and accuracy class is not under the control of the PP and governed by state utility/14/,/17/. Hence, accepted by assessment team Thus, during current monitoring period, new installed meter remains calibrated till 13/12/2018. Then delay period observed from 14/12/2018 till 31/12/2020 (Last date of monitoring period). However, recently new meters were tested for the error by state utility on 16/02/2021 and found that error of the new meter is within permissible limit. Same was confirmed from test certificates/14/. PP has submitted records of the meter calibration for the meters/14/ and the observed percent error for all meters was within the maximum permissible limit of 0.2%. Thus, delayed calibration is addressed in line with para 366 (a) of the "CDM validation and verification standard for project activities, Version 03 by applying maximum permissible error for complete delayed period covering complete months as conservative approach. Same was accepted by the assessment team being inline with standard and most conservative approach.
Findings	CAR#04 was raised and resolved
Conclusion	The DOE confirms that the calibration is conducted at the frequency as specified by the methodology and the registered monitoring plan.

E.8. Assessment of data and calculation of emission reductions or net removals

E.8.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	The baseline emissions are calculated as per provisions indicated in the registered PDD/1/ and applied methodology/3/. Baseline emissions are calculated as follows:

	$BE_y = EG_{BL,y} \times EF_{CO2,grid,y}$ Where, $EG_{BL,y}$ = Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh) $EF_{CO2,grid,y}$= CO_2 Emission Factor in year 'y'= $EF_{grid,CM,y}$ = 0.9487 tCO_2/MWh BE_y = 39,355.291 x 0.9448 = 37,182 tCO_2 (Rounddown Value) The value of baseline emission achieved after applying the formulae is 37,182 tCO_2e (Rounddown value & error factor applied for delayed calibration period). All the data was made available and have monitored as per required monitoring frequency/1/. The baseline emissions are calculated as per provisions indicated in the registered PDD/1/ and applied methodology/3/. The means of verification for the values of parameters, used for baseline emission calculation, is described in the section E.6.2 of this report. The expressions given in this regard under section E.1 of MR/6/ were found consistent with the registered PDD/1/ and applied methodology/3/. The explanation of formulae in the MR/6/ and ER sheet/7/ is adequate and consistent.
Findings	CAR#05 was raised and resolved
Conclusion	The verification team confirms that appropriate methods and formulae for calculating baseline emissions have been followed. The assumptions, emission factors and default values that were applied in the calculations are justified.

E.8.2. Calculation of project GHG emissions or actual net anthropogenic GHG removals by sinks

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the registered CDM project activity. The verification team has checked whether calculations of baseline GHG emissions, project GHG emissions and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan/7/.
Findings	There is no CAR/CL raised in this section.
Conclusion	The project emissions are regarded as zero according to the applied methodology/3/ and registered PDD/1/.

E.8.3. Calculation of leakage GHG emissions

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the registered CDM project activity. The verification team has checked whether calculations of baseline GHG emissions, project GHG emissions and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan.
Findings	There is no CAR/CL raised in this section.
Conclusion	The leakage emissions are regarded as zero according to the applied methodology/3/ and registered PDD/1/.

E.8.4. Summary calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

Means of verification	The final verified Emission Reductions in the current monitoring period are as under; Monitoring Period: 11/01/2013 to 31/12/2020 (Inclusive of both days) Baseline Emissions: 37,182 tCO_2e

	<table><tr><td>Project Emissions</td><td>0 tCO2e</td></tr><tr><td>Leakage Emissions</td><td>0 tCO2e</td></tr><tr><td>**Emission Reductions**</td><td>**37,182 tCO_2e**</td></tr></table> The value of baseline emission obtained by applying the equations provided in the registered PDD/1/ are 37,182 tCO_2e. Project emissions and leakages for the project activity are considered as zero. Therefore, the final value of net GHG emission reductions obtained is **37,182 tCO_2e**.
Findings	There is no CAR/CL raised in this section.
Conclusion	a) A complete set of data for the specified monitoring period was available, on all occasions based on the activity level of the parameters; b) The information provided in the monitoring report/6/ and corresponding spreadsheet/7/ has been cross checked; c) The assessment team confirms that the formulae for calculating baseline and project emissions (BE and PE) are in accordance with monitoring plan contained in the registered PDD/1/ and applied methodology/3/. d) There are no leakages in accordance with applied methodology and registered PDD/1/. e) The assumptions/emission factors used in emission calculations have been correctly applied and are justified/1/.

E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Means of verification	The actual emission reduction achieved in the monitoring period is 37,182 tCO_2e, whereas the estimated ERs in the registered PDD/1/ is 54,394 tCO_2e. Actual emission reduction is 32% lower than the emission reductions for the considered monitoring period.
Findings	No finding raised on the section
Conclusion	Justification of lower emission reductions have been provided in the section E.6 of the MR/6/. The explanation was found satisfactory. Thus, the comparison between the actual GHG emission reductions and the estimated GHG emission reductions was found to be ok.

E.8.6. Remarks on difference from estimated value in registered PDD

Means of verification	According to the Project participant, the emission reductions have decreased from the estimated emission reduction. The lower ER is due to low PLF (=Plant Load Factor) achieved during the current monitoring period as compared to the PLF in the registered PDD. Hence accepted by verification team.
Findings	No finding raised on the section
Conclusion	Assessment team checked the decrease in PLF for the project and found that the generation is nature dependent based on wind availability and PP do not have control over the generation of the WTGs. Thus, assessment team is in opinion that cause of decrease in the ERs achieved than estimated are appropriately reported in the MR and accepted by assessment team.

E.8.7. Actual GHG emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Means of verification	The verification team has determined the GHG emission reductions achieved during first commitment period and second commitment period
Findings	There is no CAR/CL raised in this section.
Conclusion	1. GHG emission reductions or net GHG removals by sinks reported up to 31 December 2012: 0 tCO_2e 2. GHG emission reductions or net GHG removals by sinks reported from 1 January 2013 onwards: 37,182 tCO_2e (Monitoring period starting from 01/01/2013) 3. GHG emission reductions or net GHG removals by sink reported from 1

	January 2021 = 0 tCO_2e

E.9. Assessment of reported sustainable development co-benefits

Means of verification	NA
Findings	NA
Conclusion	NA

E.10. Global stakeholder consultation

Means of verification	NA
Findings	NA
Conclusion	NA

SECTION F. Internal quality control

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

SECTION G. Verification opinion

Earthood Services Private Limited (Earthood), contracted by M/s National Enterprises, has performed the independent verification of the emission reductions for the CDM project activity 5678 “Wind Power Project by National Enterprises at Tamil Nadu, India” in India for the monitoring period 11/01/2013 to 31/12/2020 (including both days) as reported in the Monitoring Report (public) Version 1 dated 28/05/2021 and Monitoring Report (Final) Version 02 dated 18/10/2021. M/s National Enterprises is responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

Earthood commenced the verification on the basis of the baseline and monitoring methodology AMS-I.D “Grid connected renewable electricity generation” (EB 61, Version 17), the monitoring plan contained in the PDD Version 06 dated 14/10/2011, Monitoring Report (public) Version 1 dated 28/05/2021.

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

The verification team confirms that the project activity was found completely implemented as per the description given in the registered PDD and the actual operation conforms to the description in the registered PDD.

SECTION H. Certification statement

It is our responsibility to express an independent verification statement on the reported GHG emission reductions from the project activity.

In our opinion the GHG emissions reductions reported for the project activity for the period 11/01/2013 to 31/12/2020 (including both days) are fairly stated in the Monitoring Report (final) Version 02 dated 18/10/2021. The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology AMS-I.D “Grid connected renewable electricity generation” (EB 61, Version 17) and the monitoring plan contained in the PDD Version 06 dated 14/10/2011.

Earthood Services Private Limited is able to certify that the emission reductions from the CDM project activity 5678 “Wind Power Project by National Enterprises at Tamil Nadu, India” in India during the period 11/01/2013 to 31/12/2020 (including both days) amount to 37,182 tCO_2e.

Verified and certified emission reductions (for current monitoring period) as per commitment period:

Commitment period	**Amount**
Up to 31/12/2012 (1st commitment period)	Nil
From 01/01/2013 to 31/12/2020	37,182 tCO_2e
From 01/01/2021	Nil

Appendix 1. Abbreviations

Abbreviations	Full texts
AS	Accreditation Standard
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM PCP for PA	Clean Development Mechanism Project Cycle Procedure for Project Activities
CER	Certified Emission Reduction(s)
CL	Clarification Request
CPCB	Central Pollution Control Board
DOE	Designated Operational Entity
DNA	Designated National Authority
EB	Executive Board
Earthood	Earthood Services Private Limited
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
GOI	Government Of India
IR	Internal Resource
IPCC	Intergovernmental Panel on Climate Change
MOEFCC	Ministry of Environment, Forests & Climate Change
MR	Monitoring Report
MW	Mega Watt
PDD	Project Design Document
PP	Project Participants
TNEB	Tamil Nadu Electricity Board
QA/QC	Quality Assurance / Quality Control
MP	Monitoring Plan
SEB	State Electricity Board
tCO_2e	tonnes of Carbon dioxide equivalent
TNEB	Tamil Nadu State Electricity Board
UNFCCC	United Nations Framework Convention on Climate Change
VCR	Verification and Certification Report

Appendix 2. Competence of team members and technical reviewers

Competence Statement			
Name	Atul Takarkhede		
Education	Ph.D. Environmental Science		
Experience	12 years		
Field	Climate Change and environment		
Approved Roles			
Team Leader	YES		
Validator	NO		
Verifier	NO		
Methodology Expert	NO		
Local expert	NO		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert	YES (1.2)		
Reviewed by	Shreya Garg	**Date**	24/04/2019
Approved by	Anshika Gupta	**Date**	25/04/2019

Competence Statement			
Name	Shreya Garg		
Country	India		
Education	M.Sc. (Climate Science & Policy), TERI University		
Experience	6 Years +		
Field	Climate Change		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS.I.A., AMS.I.C., AMS.I.D., AMS.I.F., AMS.II.D., AMS.II.G., AMS.II.J., AMS.III.AV., AMS-I.D, ACM0012		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (TA 1.2, TA 3.1)		
Reviewed by	Abhishek Mahawar	**Date**	01/03/2018
Approved by	Ashok Gautam	**Date**	01/03/2018

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1.	Project Proponent	Registered CDM PDD	Version 06 dated 14/10/2011	Others
2.	LGAI Technological Center, S.A. (LGAI Tech. Center S.A)	Validation report	Version 1.1, dated 21/11/2011	Others
3.	UNFCCC	AMS-I.D "Grid connected renewable electricity generation" (EB 61, Version 17)	Version 17.0	Others
4.	UNFCCC	CDM project standard for project activities	Version 03	Others
5.	UNFCCC	CDM Validation and Verification Standard for project activities	version 03	Others
6.	Project Proponent	Monitoring Report (Published) Monitoring Report (final)	Version: 01 Dated: 28/05/2021 Version: 02 Dated: 18/10/2021	PP
7.	Project Proponent	ER sheet ER sheet (final)	Version: 01 Dated: 28/05/2021 Version: 02 Dated: 18/10/2021	PP
8.	TNEB	Commissioning certificate	30/05/2009	PP
9.	TNEB PP	JMR (monthly credit notes) covering monitoring period Daily generation logbooks maintained at the plant	-	PP
10.	Project Proponent	Invoices covering monitoring period	-	PP
11.	Project Proponent	O&M reports for controller meter readings (DGR)	-	PP
12.	UNFCCC	CDM-MR-FORM	version 9.0	Others
13.	CEA	CEA database	Version 05	Others
14.	PGVCL & Bharti Automation Pvt ltd	Calibration certificates		PP
15.	Project Proponent	Training records for employees	-	PP
16.	Project Proponent	Breakdown record for the monitoring period	-	PP
17.	Tamilnadu Electricity Board (TNEB)	Power Purchase Agreement for both TDA 74 & TDA 76	30/05/2009	PP
18.	-	Remote Audit/PP interviews	28/08/2021	-
19.	UNFCCC	UN project webpage https://cdm.unfccc.int/Projects/DB/RINA1326467420.68/view	NA	Other
20.	UNFCCC	CDM project cycle procedure for project activities	Version 03.0	Other

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

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

FAR ID	01	**Section no.**	NA	**Date :** DD/MM/YYYY
Description of FAR				
There was FAR from the validation of the project activity, however, same have been closed during first verification and thus, there is no pending FAR for the project activity.				
Project participant response				**Date :** DD/MM/YYYY
NA				
Documentation provided by project participant				
NA				
DOE assessment				**Date:** DD/MM/YYYY
NA				

Table 2. CL from this verification

CL ID	01	**Section no.**	E.3	**Date:** 01/09/2021
Description of CL				
PP requested to submit copies of Commissioning certificate & PPA of the project activity.				
Project participant response				**Date:** 13/09/2021
Copies of Commissioning certificate & PPA is now being submitted to the DoE.				
Documentation provided by project participant				
1. Commissioning Certificate *2. PPA*				
DOE assessment				**Date:**30/09/2021
PP has now submitted copies of commissioning certificates and Power purchase Agreement to the assessment team. Same is found consistent thus accepted and **CL is closed.**				

Table 3. CAR from this verification

CAR ID	01	**Section no.**	E.1	**Date:** 01/09/2021
Description of CAR				
1. Monitoring report is not clear about inclusion of first & last dates. Correction requested in the monitoring report.				
Project participant response				**Date:** 13/09/2021
1. The MR version 02 now reflects the corrected details. MR version 02 is submitted to DOE for further assessment.				
Documentation provided by project participant				
Revised MR, V02, 13/09/2021				
DOE assessment				**Date:** 30/09/2021
PP has now mentioned about inclusion of first and last date of monitoring period in the revised MR. found correct thus **CAR is closed**				

CAR ID	02	**Section no.**	E.3	**Date :** 01/09/2021
Description of CAR				
Information on WTGs breakdowns which have impact on the ability of the project activity to reduce GHG emissions is missing in the Section B.1 of the MR.				
Project participant response				**Date :** 13/09/2021
WTGs Breakdown details is now being included in MR Version 02 and the supporting is now being submitted to the DoE.				
Documentation provided by project participant				
Revised MR, v02, 13/09/2021				
DOE assessment				**Date:** 30/09/2021

PP has now mentioned about WTGs breakdown in the appendix 2 of revised MR. Assessment team found no major breakdown happen during the current monitoring period which impact the continuity of archived emission reduction. Thus, accepted and **CAR is closed.**

CAR ID	03	**Section no.**	E.6.2	**Date :** 01/09/2021
Description of CAR				
PP requested to submit Monthly JMRs and invoices for complete monitoring period. Emission reductions calculations are reserved till submission of supporting documents.				
Project participant response				**Date :** 13/09/2021
JMR & Invoices for Complete monitoring period is now being submitted to the DoE. The same is reflected in the ER sheet as well.				
Documentation provided by project participant				
JMR & Invoices for complete Monitoring Period.				
DOE assessment				**Date:** 30/09/2021
Copies of JMR and invoices relevant to the current monitoring period is submitted to the assessment team. During review, Electricity generation and imported data in ER sheet found consistent with JMRs/invoice. Thus, accepted and **CAR is closed.**				

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CAR ID	04	**Section no.**	E.7	**Date :** 01/09/2021
Description of CAR				
PP requested to submit calibration certificates covering the complete monitoring period and apply error factors for the delayed period if any. Corrective action sought.				
Project participant response				**Date :** 13/09/2021
Calibration certificates provided now. Correction factor has been applied to months for which calibration is delayed.				
Documentation provided by project participant				
Calibration Certificates for whole monitoring period.				
DOE assessment				**Date:** 30/09/2021
PP has submitted copies of calibration certificates and Meter change certificates. During review, assessment team observed old meters of 0.5 accuracy are replaced with new 0.2s accuracy meters on 14/12/2017. The accuracy class of the meter is 0.2 as per onsite practice during onsite visit of the verification team. The 0.2s meter are more accurate & precise and therefore emission reduction is more conservative. Therefore, the same is acceptable to the assessment team. Moreover, delayed calibration period also observed in which PP has applied error factor as per the standards. Thus, accepted and **CAR is closed.**				

CAR ID	05	**Section no.**	E.8.	**Date :** 01/09/2021
Description of CAR				
PP requested to submit ER sheet with round down of the baseline emissions for review and checking by assessment team. Kindly submit.				
Project participant response				**Date :** 13/09/2021
ER Sheet is now being submitted to the DoE by applying round down function in the baseline emission calculation. The same is reflected in the ER sheet.				
Documentation provided by project participant				
Revised ER Excel worksheet – v02				
DOE assessment				**Date:** 30/09/2021
PP has submitted revised ER sheet to the assessment team. Calculation for achieved emission reduction found correct and conservative thus accepted and **CAR is closed.**				

Table 3. FAR from this verification

FAR ID	NA	**Section No.**	NA	**Date :** DD/MM/YYYY
Description of FAR				
There is no FAR from this verification				
Project participant response				**Date :** DD/MM/YYYY
NA				
Project participant response				
NA				
Project participant response				**Date:** DD/MM/YYYY

NA
Project participant response

Appendix 5. Calibration Details

WTG HTSC No.	Meter Type	Meter Make	Meter Serial No.	Meter Accuracy Class	Date of Calibration
2848	Main	Premier	TNU04978	0.5	23/02/2013
2849	Main	Elestar	04954732	0.5	23/02/2013

During current monitoring period, Above meters of 0.5 accuracy changed to new meters with 0.2s accuracy (given in below table) on 14/12/2017[4]

WTG HTSC No.	Meter Type	Meter Make	Meter Serial No.	Meter Accuracy Class	Date of Calibration
2848	Main	Secure	X0369793	0.2s	16/02/2021
2849	Main	Secure	X0369644	0.2s	16/02/2021

Note: - As per previous verification, calibration is done on 23/02/2013 as per the monitoring plan next calibration is due till 22/02/2014, Error factor will not be applied till Feb 2014. Error factor has been applied due to delay in calibration applied from 22/02/2014 with accuracy class 0.5s till 13/12/2017.

Meter has been changed on 14/12/2017 with meter accuracy class 0.2s. No error factor has been applied till 13-12-2018. Error factor has been applied with accuracy class 0.2s from 13/12/2018 onwards due to delay in calibration till 31/12/2020.

[4] The observed percent error for all old meters was within the maximum permissible limit of 0.5%. Thus, delayed calibration is addressed in line with para 366 (a) of the "CDM validation and verification standard for project activities, Version 03" by applying maximum permissible error for complete delayed period covering complete months as conservative approach.

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 project activities" (CDM-EB93-A05-STAN); • Make structural and editorial improvements.
02.1	11 January 2018	Editorial revision to correct the numbering of appendices in the instructions.
02.0	31 October 2017	Revision to align with the requirements of the "CDM validation and verification standard for project activities" (version 01.0).
01.0	23 March 2015	Initial publication.

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