



**Verification and certification report form for
CDM project activities
(Version 03.0)**

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	Vaayu India Wind Power Project in Tamilnadu UNFCCC ref.No-4930
Scale of the project activity	<input checked="" type="checkbox"/> Large-scale <input type="checkbox"/> Small-scale
Version number of the verification and certification report	04
Completion date of the verification and certification report	13/10/2020
Monitoring period number and duration of this monitoring period	Monitoring period number- sixth monitoring period 12/02/2016 to 02/01/2018 (both days are included)
Version number of the monitoring report to which this report applies	06
Crediting period of the project activity corresponding to this monitoring period	Fixed crediting period - Start date: 19/07/2011 Length: 10 years (19/07/2011 to 18/07/2021)
Project participants	Vaayu (India) Power Corporation Private Limited ACT Financial Solutions B.V. First Climate Markets A.G.
Host Party	India
Applied methodologies and standardized baselines	ACM0002, version 12.1.0 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"
Mandatory sectoral scopes	Sectoral scope : 1- Energy industries (renewable - / non-renewable sources)
Conditional sectoral scopes, if applicable	Not applicable
Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD	196,153 tCO ₂ e
Certified amount of GHG emission reductions or GHG removals for this monitoring period	170,139 tCO ₂ e
Name and UNFCCC reference number of the DOE	LGAI Technological Center, S.A. (Applus+ Certification) UNFCCC Ref. No.: E-0032
Name, position and signature of the approver of the verification and certification report	Mr. Juan Sendín Caballero Applus+ Certification Business Unit Managing Director Signature:

SECTION A. Executive summary

>> LGAI Technological Center, S.A. (hereafter referred to as Applus+ Certification) has been contracted by M/s Vaayu (India) Power Corporation Private Limited to perform the sixth periodical verification of "Vaayu India Wind Power Project in Tamilnadu " (UNFCCC Ref. No. 4930) applying the methodology ACM0002 Version: 12.1.0. The management of M/s Vaayu (India) Power Corporation Private Limited is responsible for the preparation of the GHG emissions data and the reported GHG emission reductions.

A desk review and a site visit have been conducted to verify the data submitted in the monitoring report. Applus+ Certification confirms the following has been reviewed:

- The approved registered PDD/1.3/, including the monitoring plan and the corresponding validation report;
- Monitoring report of previous monitoring period as well as corresponding verification report;
- Monitoring report of this monitoring period;
- The applied monitoring methodology;
- Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board;
- All information and references relevant to the project activity's resulting in emission reductions.

The project activity involves supply, erection, commissioning and operation of 63 machines of rated capacity 800 kW each, making the total installed capacity to be 50.4 MW in the Tirunelveli district in Tamil Nadu, India. In Feb 2016, ownership of 19 machines has been transferred to its subsidiary company "Vaayu Renewable Energy (Godavari) Private Limited (VREGPL)"1.7/. As described in the revised approved PDD, post ownership change, PPA for 19 WTGs has also changed. The new PP (VREGPL) has signed the PPA with a third party (JK Tyre & Industries Limited).

Since 12/02/2016 onwards, the electricity generated by these 19 machines is being pooled through Tamil Nadu state distribution & transmission network first to state grid (part of southern grid which is now integrated with Indian Grid) and then further supplied to JK Tyre & Industries. It is to be noted that electricity generated through remaining 44WTGs of VPCPL is being supplied to TNEB in line with the original PPA signed with state utility. Post registration changes with reference to these changes identified in the registered PDD were approved by UNFCCC on 16/01/2019.

This is renewable energy generation project that can replace the fossil fuel dominated grid connected electricity generation. These WTGs are of Wind World make E-53 model.

The current verification has been performed as per latest valid version of the CDM Standards i.e., CDM PS for PAs version 02.0 /2.2/, CDM VVS for PAs version 02.0 /2.1/.

Applus+ Certification confirms that the project is implemented in accordance with the revised approved PDD. The monitoring plan complies with the applied methodology ACM0002 Version: 12.1.0 and the monitoring have been carried out in accordance with the approved monitoring plan. The monitoring system is in place and the emission reductions are calculated without material misstatements. Our opinion relates to the projects GHG emissions and the resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring and its associated documents. Based on the information reviewed and evaluated Applus+ Certification confirms that the implementation of the project has resulted in 170,139 tCO_{2e} emission reductions during period 12/02/2016 to 02/01/2018.

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 review	On-site inspection	Interview(s)	Verification findings
1.	Lead Auditor / Technical Expert	OR	Ahirwar	Vivek Kumar	GCEES	Y	Y	Y	Y

2.	Auditor in Training	OR	Soni	Ravi Kant	GCEES	Y	Y	Y	Y
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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 / Technical Expert	EI	Shen	Simon	Applus+ Certification
2.	Approver	IR	Sendín	Juan	Applus+ Certification

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.	Manual adjustment of otherwise automatically recorded activity levels: This error may be due to manually recording of actual readings in-to original records.	Low	Monitoring Equipment e.g. Energy Meters have totalizer which reduce the chance of error as initial readings and final readings can be cross –check in every records /3.3/, /3.4/. The reading of JMR is being recorded in the presence of representatives of DISCOM and O&M contractor. So chances of noting down incorrect reading diminish. Monthly statements are endorsed by state utility.	100 per cent of the data and information was checked from Monthly statements /3.3/ and cross-checked from sold electricity invoices /3.4/ (in case of sale to grid) and as per the process as reported in the approved monitoring plan (in case of third party sale).
2.	Human error in the quantification of emissions. This error may be due to transfer of monitored data in-to Emission Reduction calculation sheet/4.2/ for calculation of actual emission reduction archived during monitoring period.	High	The monitoring data is transfer manually, so there is high potential risk of errors/errors, omissions or misstatements.	100 per cent of the data and information was checked from Monthly statements /3.3/and cross-checked from monthly invoices raised to state utility /3.4/ (in case of sale to grid) and as per the process as reported in the approved monitoring plan (in case of third party sale).

C.2. Consideration of materiality in conducting the verification

>> The project activity is large- scale project and applicable threshold for materiality in accordance with CDM VVS for PAs Version 02.0 paragraph 326(c) is 2%. All the monthly reported figures for parameter **EG_{PJ,y}** were verified with respective monthly statements and were found to be consistent. Therefore, it can be stated that the verified value is free from any potential error / omission / misstatement. The project activity, being a wind energy project, has assumed the project emission and leakages to be zero which is in line to the applied methodology/2.3/ and is also reasonable in the opinion of assessment team. Therefore, there are no additional factors which might lead to introduction of error in emission reduction estimation.

SECTION D. Means of verification**D.1. Desk/document review**

- >> The Monitoring Report version 01 dated 25/01/2018/1.0/ submitted by the PP was made publicly available on the UNFCCC website before the verification activities started. The published MR was assessed based on all the relevant documents. The aim of the assessment in the desk review was to: verify the completeness of the data and the information presented in the MR;
- Check the compliance of the MR with respect to the monitoring plan depicted in the revised approved PDD and verify that the applied methodology was carried out. Particular attention to the frequency of measurements, the quality of the metering equipment including calibration requirements, and the quality assurance and quality control procedures was paid;
- Evaluate the data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

A complete list of documents reviewed or referenced is available in Appendix 3 of this report.

D.2. On-site inspection

Duration of on-site inspection: 23/02/2018				
No.	Activity performed on-site	Site location	Date	Team member
1.	Confirm the implementation and operation of the project;	WTG project site Vagaikulam, Kuruchikulam, Ettankulam, Kalakudi, Muthammalpuram and Ukkirankottai villages, in District Tirunelveli, State of Tamil Nadu, India	23/02/2018	Vivek Kumar Ahirwar & Ravi Kant Soni
2.	Review the data flow for generating, aggregating and reporting the monitoring parameters;		23/02/2018	Vivek Kumar Ahirwar & Ravi Kant Soni
3.	Confirm the correct implementation of procedures for operations and data collection;		23/02/2018	Vivek Kumar Ahirwar & Ravi Kant Soni
4.	Cross-check the information provided in the MR documentation with other sources;		23/02/2018	Vivek Kumar Ahirwar & Ravi Kant Soni
5.	Check the monitoring equipment against the requirements of the PDD and the approved methodology, including calibrations, maintenance, etc.;		23/02/2018	Vivek Kumar Ahirwar & Ravi Kant Soni
6.	Review the calculations and assumptions used to obtain the GHG data and ER;		23/02/2018	Vivek Kumar Ahirwar & Ravi Kant Soni
7.	Identify if the quality control and quality assurance procedures are in place to prevent or correct errors or omissions in the reported parameters.		23/02/2018	Vivek Kumar Ahirwar & Ravi Kant Soni

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Yadav	Vikash	Vaayu (India) Power Corporation Private Limited (Manager)	23/02/2018	Project Activity Description, implementation and operation of the project. Calculations and assumptions used to obtain the GHG data and ER.	Vivek Kumar Ahirwar & Ravi Kant Soni
2.	Bharthi	P	WWIL (Engineer)	23/02/2018	Post registration changes	Vivek Kumar Ahirwar & Ravi Kant Soni
3.	Palani	R	WWIL(Sr. Engineer)	23/02/2018	Monitoring Data & Records, Energy Bills/Records	Vivek Kumar Ahirwar & Ravi Kant Soni
4.	Kumar	Lavan	WWIL (Technician)	23/02/2018	Monitoring, equipment , calibrations, maintenance, data records, certificates etc.;	Vivek Kumar Ahirwar & Ravi Kant Soni

D.4. Sampling approach

>> Not Applicable, as all monitoring data as reported in MR and ER were verified and checked from 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	CL #2	-	-
Compliance of the project implementation and operation with the registered PDD	CL #1	-	-
Post-registration changes	-	CAR #1	-
Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines	-	-	-
Compliance of monitoring activities with the registered monitoring plan	-	-	-
Compliance with the calibration frequency requirements for measuring instruments	-	CAR #4	-
Assessment of data and calculation of emission reductions or net removals	-	CAR #2	-
Assessment of reported sustainable development co-benefits	-	-	-
Global stakeholder consultation	-	-	-
Others (missing documents)	-	CAR #3	-
Total	2	4	-

SECTION E. Verification findings**E.1. Compliance of the monitoring report with the monitoring report form**

Means of verification	The Monitoring Report/1.2/ is compliant with Monitoring Report form (Version 07.0) /2.4/ and guidance as provided by UNFCCC. Applus+ Certification considers that the attachment "Instructions for filling out the monitoring report form" at the end of template "Monitoring report form (Version 06.0)" /2.4/ has been followed. Relevant information was provided by the project participant in the applicable Monitoring Report sections.
Findings	CL #2 was raised and resolved.
Conclusion	Applus+ Certification confirms that the monitoring report is in compliance with the relevant valid form and instructions therein as accordance to "Clean Development Mechanism Validation and Verification Standard for Project Activity" (CDM- VVS for PA) v02.0 §§ 352-353.

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

>> This is sixth periodic verification of the project. There are no pending issues from the validation or the previous verification/1.6/. This was verified and confirmed from the project documents on the UNFCCC project webpage /1.5/.

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

Means of verification	<p>The project activity is fully implemented according to the description presented in the revised approved PDD /1.3/. The assessment team confirms, through the visual inspection that all physical features of the CDM project activity including data collecting systems and storage have been implemented in accordance with the revised approved PDD /1.3/.</p> <p>This project activity involves generation of electricity from WTGs and supplying the generated electricity to the Southern grid (Now part of integrated Indian Grid) and third party JK Tyre & Industries Limited as mentioned in section A of this report. The project, located in Tirunelveli District of Tamil Nadu state in India, has an installed capacity of 50.4 MW (63X0.8MW, E-53 model). One PPA/3.2/ with TNEB is signed for the sale of electricity to the grid(valid for 44 WTGs) and second PPA valid for 19 WTGs is signed with third party JK Tyre & Industries Limited /3.2/.</p> <p>The project was registered as a CDM project on 19/07/2011 and the crediting period (fixed) chosen from 19/07/2011 to 18/07/2021. This is the sixth verification of the project activity covering the period from 12/02/2016 to 02/01/2018.</p> <p>The project has been implemented; equipment installed and is being operated as described in the revised approved PDD. The monitoring plan implemented during the current monitoring period is in compliance with the approved registered monitoring plan and the applied methodology. This was verified during the site visit.</p> <p>Geo co-ordinates of the project location is at latitude from 8°52'12.368" to 8° 56' 6.770" N and longitude from 77°35'0.824" to 77°37'9.822" E. Location of the project was verified through Google Maps (https://www.gps-coordinates.net/) and found consistent with the same mentioned in the revised approved PDD and MR.</p> <p>The project activity WTGs were commissioned from 29/09/2010 and 11/07/2011 as mentioned in the Monitoring Report, commissioning dates of WTGs have been verified against the commissioning certificates/3.1/ and is found to be correct. The line diagram of the metering system of the project activity showing metering points is indicated in section C of the MR/1.2/.</p> <p>During the site visit the WTGs belongs to the project activity are connected to the dedicated meters through different clusters at 33 kV metering points at project site. The cluster meters are further connected to the WWIL pooling substation at Pillayarkulam (110 kV bulk metering point).</p> <p>The bulk metering point at WWIL substation having one main meter and check meter. It is to be noted that the project activity WTGs and non-project WTGs are connected to the bulk metering point, hence the net electricity supplied to the grid</p>
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	<p>by project activity(at 110 kV metering point) is calculated adjusting the transmission losses to the generation recorded at 33 kV metering point.</p> <p>The procedure to calculate the net electricity supplied to the grid by the WTGs of the project activity has been correctly described in section C of the MR and in section B.7.3 of the revised approved PDD. This was also verified by interviewing the staff at the sub-station and the officials of the state utility.</p> <p>The transmission loss calculation is carried out by the state utility and the PP has no role in this calculation. It was confirmed from the representatives of the O&M provider during the site visit, that the procedure to derive the electricity exported to the grid by each project owner is completely under jurisdiction of the state utility/6.1/.</p> <p>During the site visit current status of each WTG was verified by the verification team through the online CMS system maintained at project site and confirmed that all the 63 machines were functional.</p> <p>Actual emission reductions achieved during the current monitoring period are 13.26 % lesser than the same estimated in the revised approved CDM-PDD for comparable period. This is due to low plant load factor achieved during the current monitoring period (Kindly refer section E.8.6 of this report for further details).</p> <p>No events or situations that may impact the applicability of the methodology occurred during this monitoring period, which was confirmed by checking the operational/shut down details available at site office and interviewing the site personnel. The project was checked against the applicability criteria in the applied methodology ACM0002 Version 12.1.0 and it is confirmed that the methodology is applicable to the project activity. The data and variables provided in the Monitoring Report are the same as stated in the revised approved monitoring plan.</p>
Findings	CL #1 was raised and resolved.
Conclusion	<p>Applus+ Certification confirms that the implementation of project activity is in compliance with the CDM requirement stipulated under CDM-VVS for PA v02.0 §§ 354-356.</p> <ul style="list-style-type: none"> i. The implementation and operation of the project activity has been conducted in accordance with the description contained in the registered PDD. ii. By means of an on-site inspection the verification team is able to confirm that all physical features (technology, project equipment, and monitoring and metering equipment) of the registered CDM project activity are in place and that the project participants have operated the project activity as per the registered PDD. iii. No information with regard to data and variables was identified that may surpass the estimated quantity of ERs in the registered PDD. iv. The emission reductions achieved during the current monitoring period are 170,139 tCO₂e, within the estimated quantity (196,153 tCO₂e) in the approved registered PDD for the comparable period.

E.4. Post-registration changes

E.4.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents¹

>> There are no temporary deviations from the monitoring plan of approved registered PDD/1.3/ or applied methodology/2.3/ during the current monitoring period. It was verified and confirmed from the Monitoring Report/1.2/, revised approved PDD/1.3/, UNFCCC project webpage /1.5/ and on-site verification/6.1/ & /6.2/.

¹ 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).

E.4.2. Corrections

>> The corrections to the registered project activity have been approved on 16/01/2019 (PRC Ref: PRC-4930-002).

(Ref: Validation opinion on changes in PDD, version 04, dated 14/11/2018)/1.7/)

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

>> There are no changes to the start date of crediting period identified during the current monitoring period. It was verified and confirmed from the UNFCCC project webpage /1.5/.

E.4.4. Inclusion of a monitoring plan

>> There is no inclusion of a monitoring plan identified during the current 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

>> Permanent changes from the registered monitoring plan have been approved by the board on 16/01/2019 (PRC Ref: PRC-4930-002).

(Ref: Validation opinion on changes in PDD, version 04, dated 14/11/2018)/1.7/

E.4.6. Changes to the project design

>> Changes to the project design have been approved by the board on 16/01/2019 (PRC Ref: PRC-4930-002).

(Ref: Validation opinion on changes in PDD, version 04, dated 14/11/2018)/1.7/

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	<p>The monitoring plan as contained in the revised approved PDD/1.3/ was reviewed against the monitoring requirements of the applied methodology ACM0002 version 12.1.0. Based on this review it was found the monitoring plan contained in the revised approved PDD 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 revised approved PDD /1.3/ and applied methodology ACM0002 version 12.1.0 /2.3/.</p> <p>It was observed during the site visit that, the WTGs belongs to the project activity are connected to the dedicated meters through different clusters at 33 kV metering points at project site. The cluster meters are further connected to the WWIL pooling substation (110 kV bulk metering point).</p> <p>The bulk metering point at WWIL substation having one main meter and check meter. It is to be noted that the project activity WTGs and non-project WTGs are connected to the bulk metering point, hence the net electricity supplied to the grid by project activity(at 110 kV metering point) is calculated adjusting the transmission losses to the generation recorded at 33 kV metering point.</p> <p>The procedure to calculate the net electricity supplied to the grid by the WTGs of the project activity has been correctly described in section C of the MR and in section B.7.3 of the revised approved PDD. This was also verified by interviewing the staff at the sub-station and the officials of the state utility.</p> <p>The monitoring parameter relevant to this project activity listed in the applied methodology/2.3/ is:</p> <p>$EG_{\text{facility},y}$ – Quantity of net electricity generation supplied by the project plant/unit to the grid in year y</p> <p>The monitoring parameters defined in the revised approved PDD are:</p> <p>$EG_{PJ,y}$ – Net Electricity Exported to the grid by the project</p> <p>$EG_{\text{Export},y}$ – Electricity exported by project activity to grid and/or third party recorded at 33kV metering point (Cluster meter)</p>
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EG_{Import,y} – Electricity imported by project activity from the grid and/or third party recorded at 33kV metering point (Cluster meter) **T_E** – Line loss between the metering point at 33 kV metering points of project activity and the metering point at 110 kV at the WWIL pooling substation

As per the actual practice followed at the site, the parameter **EG_{PJ,y}** is calculated using the parameters **EG_{Export,y}**, **EG_{Import,y}** and transmission losses. Hence, the PP has defined these parameters in the approved monitoring plan in addition to the parameter **EG_{PJ,y}**. The monitoring plan has been implemented from the commissioning of the project activity. However in Feb 2016, ownership of 19 machines has been transferred to its subsidiary company “Vaayu Renewable Energy (Godavari) Private Limited (VREGPL)”. The electricity generated by these 19 machines is being pooled through Tamil Nadu state distribution & transmission network first to state grid (part of southern grid which is now integrated with Indian Grid) and then further supplied to JK Tyre & Industries.

Main changes to the registered monitoring plan are identified due to monitoring of electricity generated by the 19 WTGs, transferred to new entity VREGPL and these changes were approved by UNFCCC on 16/01/2019/1.5/. The assessment team can confirm, the monitoring plan of the registered project is in accordance with the applied methodology.

A comparison between the requirement of the methodology, for the parameter **EG_{PJ,y}**, and the description of the same parameter in the approved monitoring plan is provided in the table below:

Revised approved PDD Approved Methodology	Requirement in the applicable methodology and relevant EB documents	Requirement in the registered monitoring plan	Opinion
Data/Parameter	EG _{facility,y}	EG_{PJ,y}	In compliance with the applicable methodology.
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y	Net Electricity Exported to the grid and/or third party by the project	In compliance with the applicable methodology.
Measured/Calculated /Default	Directly measured	Calculated based on measured parameters	The net electricity exported to the grid and/or third party by the project activity is calculated by TNEB from the directly measured values. The PP has no control in this calculation. Hence, in compliance with the monitoring plan and methodology. This approach has been described in section B.7.3 of the approved registered PDD, hence accepted.
Source of data	Not Specified	Monthly statement provided by TNEB/TANGEDCO	This is as per the actual practice on site by the state utility, governed by the PPAs signed for this project activity. Hence accepted.
Monitoring equipment	Energy meters	Not Applicable since this is a calculated parameter	This parameter is calculated using the directly measured values of electricity exports and imports measured at 33 kV and transmission losses

				(Please refer section E.6.2 for further details). Hence accepted.
	Measuring/Reading/ Recording frequency	Continuous monitoring, hourly measurement and at least monthly recording	Recording Frequency: Monthly	The Hourly measurement and monthly Recording is for the directly measured $EG_{PJ,y}$ as per the applicable methodology. However this parameter is calculated as justified in the row "Measured/Calculated /Default" above, hence the monthly recording frequency is acceptable since it is as per the actual practice on site by the state utility. Hence accepted.
	Calculation method (if applicable)	Not Applicable	As per the apportioning procedure as described under section B.7.3 of the revised approved PDD.	This is as per the actual practice on site by the state utility. Hence accepted. The same procedure is mentioned in the approved monitoring plan and PPA as well.
	QA/QC procedures	Measurement results shall be cross-checked with records for sold electricity.	<p>In case of sale to grid (44 WTGs)-</p> <p>The values $EG_{PJ,y}$ mentioned in the Monthly statement will be cross-checked against values mentioned in the invoice raised on the state utility.</p> <p>In case of third party (19 WTGs)-</p> <p>The values $EG_{PJ,y}$ mentioned in the Monthly statement will be cross-checked with the invoices raised by the PP to third party.</p> <p>Furthermore, the value of net electricity exported to the third party, as reflected in monthly statements issued by the state utility, will be cross checked with the monthly electricity generation by the project activity recorded through the LCS meter after subtracting the electricity import and transmission losses</p> <p>However net export value as mentioned in the monthly statement provided</p>	This is in compliance with the applicable methodology.

			by electricity board (document issued/validated by State Government Authority) would be used for emission reduction calculation.	
	In view of the above assessment, the verification team is able to confirm that the revised approved monitoring plan of the registered project is in accordance with the applied methodology.			
Findings	No non-conformability was observed during assessment. Therefore, no finding was raised			
Conclusion	Applus+ Certification confirms that the monitoring plan is in accordance with the approved methodology /2.3/ and correctly applied by the registered CDM project activity and CDM-VVS for PA v02.0 §§ 357-359 have been met.			

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 following three parameters are fixed ex-ante defined in revised approved PDD:			
	Data/parameter:	EF _{grid,OM,y}	EF _{grid,BM,y}	EF _y or EF _{grid,CM,y}
	Unit	tCO ₂ /MWh	tCO ₂ /MWh	tCO ₂ /MWh
	Description	Operating Margin Emission Factor of Southern Regional Electricity Grid	Build Margin Emission Factor of Southern Regional Electricity Grid	Combined Margin Emission Factor of Southern Regional Electricity Grid
	Source of data	Central Electricity Authority: CO ₂ Baseline database Version 05 /3.5/		
	Value(s) applied)	0.98756	0.81792	0.94515
Findings	No non-conformability was observed during assessment for monitoring plan against applied monitoring methodology. Therefore, no finding was raised.			
Conclusion	Value of all 3 parameters reported in the monitoring report /1.2/ and corresponding emission reduction calculations spreadsheet /4.2/ are consistent with the revised approved PDD. The applied values are correct and justified.			

E.6.2. Data and parameters monitored

Means of verification	The analysis of the compliance of the actual monitoring, of the monitoring parameter with the approved registered monitoring plan is provided as following:			
	1. Net Electricity Exported to the grid and/or third party by the project , $EG_{PJ, y}$ (MWh)			
	Monitoring Report, onsite checks Revised approved Monitoring Plan & Approved Methodology	Requirement in the approved registered monitoring plan/1.3/	Implementation of the project	Conclusion on the compliance of the implementation with the monitoring plan
	Data/Parameter	$EG_{PJ, y}$	$EG_{PJ, y}$	In compliance
	Description	Net Electricity Exported to the grid and/or third party by the project activity	Net Electricity Exported to the grid and/or third party by the project activity	In compliance
	Measured/Calculated /Default	Calculated based on measured parameters	Calculated based on measured parameters	In compliance
	Source of data	Monthly statement provided by TNEB/TANGEDCO	Monthly statement provided by TNEB/TANGEDCO	The net electricity exported to the grid by the project activity is calculated by TNEB from the directly measured values. The PP has no control in this calculation. Hence, in compliance with the monitoring plan and methodology
	Monitoring equipment	Not Applicable since this is a calculated parameter	Not Applicable since this is a calculated parameter	In compliance
	Measuring/Recording/Recording frequency	Recording Frequency: Monthly	Recording Frequency: Monthly	In compliance
	Calculation method (if applicable)	The net electricity exported to the grid by the project activity will be calculated by TNEB from the directly measured values as per the procedure as described in section B.7.3 of the revised approved PDD.	The net electricity exported to the grid by the project activity is calculated by TNEB from the directly measured values as per the procedure as described in section B.7.3 of the revised approved PDD.	In compliance

	<p>QA/QC procedures</p>	<p>Net electricity supplied to grid indicated in Monthly statement will be crosschecked with the invoices raised by PP.</p> <p>Net electricity supplied to third party indicated in Monthly statement will be cross-checked against the generation recorded in the LCS meters minus electricity import from the grid & transmission losses. However net export value as mentioned in the monthly statement provided by electricity board (document issued/validated by State Government Authority) would be used for emission reduction calculation.</p>	<p>Monthly values of "Net electricity supplied to grid "$(EG_{PJ,y})$ through 44 WTGs as indicated in Monthly statements have been cross-checked against values mentioned in the invoice raised to the state utility and found consistent.</p> <p>Net electricity supplied to third party through 19 WTGs as indicated in Monthly statements has been cross-checked against the invoices raised by the PP to third party (JK Tyre & Industries Limited) and found consistent</p> <p>Also in line with the revised approved monitoring plan monthly values of $EG_{PJ,y}$ (for 19 WTGs) have been cross verified with the generation recorded in the LCS meters minus electricity import from the grid & transmission losses and found comparable. However net export value as mentioned in the monthly statements is used for emission reduction calculation to retain conservativeness.</p>	<p>In compliance</p>
	<p>In summary, the actual monitoring for $EG_{PJ,y}$ is in compliance with the applied methodology and the revised approved monitoring plan.</p> <p>$EG_{PJ,y}$ is a calculated parameter, as indicated in the table above. This calculation is carried out by the state utility (Tamil Nadu Electricity Board (TNEB)/Tirunelveli Electricity Distribution Circle, Tirunelveli (TANGEDCO)), on the basis of the electricity export and import recorded through energy meters at WWIL pooling substation and the meter readings taken at 33 kV metering yard after adjusting transmission loss amongst the various wind turbines (project activity as well as non-project activity).</p> <p>Apportioning of transmission losses and subsequently determination of net electricity export to the grid/third party is completely under jurisdiction of TNEB. The PP or PPs representative is not involved directly or indirectly in the entire process. This was verified by interviewing the TNEB officials during the site visit. The calculated monthly values of $EG_{PJ,y}$ are directly sourced from Monthly statement issued by the TNEB.</p> <p>As mentioned under section B.7.3 of the revised approved PDD, monthly statements issued by the state utility contains the following data</p> <ol style="list-style-type: none"> 1. Electricity Export (EG_{export}) 2. Electricity Import (EG_{import}) 3. Line Loss between 33 kV and 110 kV metering points 4. Net Export /Generation to the Grid/third party by the project WTGs <p>The same is verified through the monthly statements and found to be in compliance. The PP has correctly reported the monthly values from the monthly statement in the emission reduction spread sheet. Since the electricity generated by the project activity is</p>			

being supplied to the grid and also sold to third party in the current monitoring period, hence cross check mechanism for the parameter $EG_{PJ,y}$ is follows as:

In case of sale to grid (through 44 WTGs), monthly values of $EG_{PJ,y}$ were cross checked with the monthly invoices raised by the PP to state utility and are found to be consistent.

In case of third party sale (through 19 WTGs) monthly values of $EG_{PJ,y}$ were cross checked with the invoices raised to third party and found to be consistent. Furthermore monthly values of $EG_{PJ,y}$ (for all WTGs) were verified against the generation recorded in the LCS meters minus electricity import from the grid & transmission losses and found comparable. However following conservative approach as stated in the approved monitoring plan, values of $EG_{PJ,y}$ mentioned in the monthly statements are used for emission reduction calculation.

The value of $EG_{PJ,y}$ for the current monitoring period is 180,013.14 MWh. This parameter is directly used for the emission reduction calculations.

2. Electricity exported by project activity to grid and/or third party recorded at 33kV metering point (Cluster meter), $EG_{Export,y}$ (MWh)

Monitoring Report, onsite checks Registered Monitoring Plan & Approved Methodology	Requirement in the registered/revised monitoring plan	Implementation of the project	Conclusion on the compliance of the implementation with the monitoring plan & applicable methodology.
Data/Parameter	$EG_{Export,y}$	$EG_{Export,y}$	In compliance
Description	Electricity exported by project activity to grid and/or third party recorded at 33kV metering point (Cluster meter)	Electricity exported by project activity to grid and/or third party recorded at 33kV metering point (Cluster meter)	In compliance
Measured/Calculated /Default	Measured	Measured	In compliance
Source of data	Monthly statement showing the electricity generated through windmills given by Tamilnadu Electricity Board (TNEB)/ Tirunelveli Electricity Distribution Circle, Tirunelveli (or TANGEDCO).	Monthly statement showing the electricity generated through windmills given by Tamilnadu Electricity Board (TNEB)/ Tirunelveli Electricity Distribution Circle, Tirunelveli (or TANGEDCO).	In compliance
Monitoring equipment	Energy meter	Energy meter	In compliance
Measuring/Reading/ Recording frequency	Recording Frequency: Monthly	Recording Frequency: Monthly	In compliance
Calculation method (if applicable)	Not applicable as this is a measured parameter.	Not applicable as this is a measured parameter.	In compliance

	QA/QC procedures	All the meters (project activity cluster meters as well as main & check meter at WWIL pooling sub-station) are calibrated by state utility once in 5 years as per the Power Purchase Agreement & CEA metering code and records are available with PP.	All the meters (project activity cluster meters as well as main & check meter at WWIL pooling sub-station) are calibrated by state utility once in 5 years as per the Power Purchase Agreement & CEA metering code and records are available with PP.	In compliance
	<p>EG_{Export,y} is the electricity exported by project activity to grid/third party recorded at 33kV metering point (cluster meter) as indicated in the table above. The cluster meter has the capability of continuous measurement, which was verified during the site visit. The monthly statement showing the electricity exported through wind turbines is recorded by TNEB on a monthly basis in presence of PP representative. The PP has correctly reported the monthly values in the emission reduction spread sheet.</p> <p>The value of EG_{Export,y} for the current monitoring period is 185,788.46 MWh. This parameter is used for calculating the parameter EG_{PJ,y}. Measurement of the reading for this parameter is carried out by the TNEB. The PP has no role in this process. This was verified by interviewing the WWIL officials during the site visit.</p> <p>In summary, the actual of monitoring for EG_{Export,y} is in compliance with the registered approved monitoring plan.</p> <p>3. Electricity imported by project activity from the grid and/or third party recorded at 33kV metering point (Cluster meter), EG_{Import,y} (MWh)</p>			
	Monitoring Report, onsite checks	Requirement in the registered/revised monitoring plan	Implementation of the project	Conclusion on the compliance of the implementation with the monitoring plan & applicable methodology.
	Registered Monitoring Plan & Approved Methodology			
	Data/Parameter	EG _{Import,y}	EG _{Import,y}	In compliance
	Description	Electricity imported by project activity from the grid and/or third party recorded at 33kV metering point (Cluster meter)	Electricity imported by project activity from the grid and/or third party recorded at 33kV metering point (Cluster meter)	In compliance
	Measured/Calculated /Default	Measured	Measured	In compliance
	Source of data	Monthly statement showing the electricity generated through windmills given by Tamilnadu Electricity Board (TNEB)/ Tirunelveli Electricity Distribution Circle, Tirunelveli (or	Monthly statement showing the electricity generated through windmills given by Tamilnadu Electricity Board (TNEB)/ Tirunelveli Electricity Distribution Circle, Tirunelveli (or TANGEDCO).	In compliance

	TANGEDCO).		
Monitoring equipment	Energy meter	Energy meter	In compliance
Measuring/Reading/Recording frequency	Recording Frequency: Monthly	Recording Frequency: Monthly	In compliance
Calculation method (if applicable)	Not applicable as this is a measured parameter.	Not applicable as this is a measured parameter.	In compliance
QA/QC procedures	All the meters (project activity cluster meters as well as main & check meter at WWIL pooling sub-station) are calibrated by state utility once in 5 years as per the Power Purchase Agreement & CEA metering code and records are available with PP.	All the meters (project activity cluster meters as well as main & check meter at WWIL pooling sub-station) are calibrated by state utility once in 5 years as per the Power Purchase Agreement & CEA metering code and records are available with PP.	In compliance

EG_{Import,y} is the electricity imported by project activity from grid and/or third party recorded at 33kV metering point (cluster meter) as indicated in the table above. The cluster meter has the capability of continuous measurement, which was verified during the site visit. The monthly statement showing the electricity imported through wind turbines is recorded by TNEB on a monthly basis in presence of PPs representative. The PP has correctly reported the monthly values in the emission reduction spread sheet.

The value of **EG_{Import,y}** for the current monitoring period is 720.67 MWh. This parameter is used for calculating the parameter **EG_{BL,y}**. Measurement of the reading for this parameter is carried out by the TNEB. The PP has no role in this process. This was verified by interviewing the WWIL officials during the site visit.

In summary, the actual of monitoring for **EG_{Import,y}** is in compliance with the registered approved monitoring plan.

4. Line loss between the metering point at 33 kV metering points of project activity and the metering point at 110 kV at the WWIL pooling substation., T_E (MWh)

Monitoring Report, onsite checks	Requirement in the registered/ revised approved PDD monitoring plan	Implementation of the project	Conclusion on the compliance of the implementation with the monitoring plan & applicable methodology.
Registered and revised PDD Monitoring Plan & Approved Methodology			
Data/Parameter	T_E	T_E	In compliance
Description	Line loss between the metering point at 33 kV metering points of project	Line loss between the metering point at 33 kV metering points of project activity and	In compliance

		activity and the metering point at 110 kV at the WWIL pooling substation	the metering point at 110 kV at the WWIL pooling substation	
	Measured/Calculated /Default		Measured	In compliance
	Source of data	Monthly Generation Statement showing the electricity generated through wind turbines issued by Tamilnadu Electricity Board (TNEB)/ Tirunelveli Electricity Distribution Circle, Tirunelveli (or TANGEDCO)	Monthly Generation Statement showing the electricity generated through wind turbines issued by Tamilnadu Electricity Board (TNEB)/ Tirunelveli Electricity Distribution Circle, Tirunelveli (or TANGEDCO)	In compliance
	Monitoring equipment	Not applicable	Not applicable	In compliance
	Measuring/Reading/ Recording frequency	Recording Frequency: Monthly	Recording Frequency: Monthly	In compliance
	Calculation method (if applicable)	Calculation method is described in section B.7.3 of the approved monitoring plan and is from the signed PPA	Calculation method is described in section B.7.3 of the approved monitoring plan and is from the signed PPA	In compliance
	QA/QC procedures	QA/QC procedures will be implemented by Discom/State utility (TNEB) pursuant to the provisions of the power purchase agreement signed with TNEB (for 44 WTGs) and new PPAs for 19 WEGs of VREGPL) except or otherwise explicitly stated in the PDD	QA/QC procedures have been implemented by Discom/State utility (TNEB) pursuant to the provisions of the power purchase agreement signed with TNEB (for 44 WTGs) and new PPAs for 19 WEGs of VREGPL).	In compliance
	<p>Transmission losses refer to the energy loss incurred between the metering points for the project WTGs at 33 kV and the receiving substation, where voltage is stepped up to 110 KV and exported to the grid/third party. The transmission losses are calculated by the state utility considering the export readings of the meter at the 110 kV substation as well as the export readings at the 33 kV metering point.</p> <p>The monthly values of transmission loss are directly sourced from the "Monthly Generation Statement" issued by state utility. The PP has correctly reported the monthly values in the emission reduction spread sheet. These monthly values reported in the ER spread sheet are verified with the values in the monthly statements and are found to be consistent.</p> <p>The value of T_E for the current monitoring period is 5,054.65 MWh. This parameter is used in the calculation of $EG_{PJ,y}$. This calculation is solely carried out by the state utility (TNEB/ TANGEDCO) and PP has no role in this process. This was verified through interactions with the site personnel and TANGEDCO officials during the site visit.</p> <p><u>Calculation of Transmission losses (T_E):</u></p>			

	<p>In line with approved monitoring plan, validation report of revised monitoring plan/1.3/ and the PPA signed by the PP with state utility and third party, Transmission losses are determined using following formula:</p> $Z = ((X - Y) / X) * 100$ <p>Where,</p> <p>Z = Percentage transmission loss for export incurred in transmission line between the meters located at 33 kV metering point and the meters located at 110kV metering point (bulk meter: main and check) at high voltage side of receiving sub-station.</p> <p>X = Energy Export Reading (X) noted at energy meter installed at 33kV metering point where i vary from 1 to n which represents the meters connected to project activity and other project developers. X1, X2, X3,...Xn are the meters that are installed at 33kV metering point (including the machines of the project activity and other project developers) and further connected to the receiving substation at 110 kV by internally connected lines.</p> <p>X = X1 + X2 +...Xn where, Xn is the reading of 'n' number of windmills connected to the sub-station; the value 'X' can be verified against the export readings of individual metering points.</p> <p>Y = Energy Export Reading at bulk meter installed at high voltage side of transformer of the receiving sub-stations at 110 kV.</p> <p>Formula as mentioned above, to calculate value of Z is standard one and exclusively used by state utility.</p> <p>Transmission loss (or line loss) incurred by the project activity between 33 kV and 110 kV metering points is obtained by multiplying the percentage of transmission loss (Z) with the difference of electricity exported and imported by the project activity as follows:</p> $T_E = Z \times (EG_{Export,y} - EG_{Import,y})$ <p>Finally net electricity supplied to the grid and/or third party is calculated as:</p> $EG_{PJ,y} = EG_{Export,y} - EG_{Import,y} - T_E$ <p>In view of the above assessment, the assessment team is able to confirm that all the parameters have been monitored appropriately, in accordance with the approved monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.</p>
Findings	CAR #2 was raised and resolved.
Conclusion	<p>Applus+ Certification confirms that the actual monitoring activities observed on site are in compliance with the monitoring plan and as described in the revised approved PDD/1.3/ and the same is in line with the monitoring methodology /2.3/.</p> <p>The applicable parameters stated in the approved monitoring plan/1.3/ and the applied methodology/2.3/ have been sufficiently monitored. The responsibilities and authorities for monitoring and reporting are in accordance with what is stated in the revised approved PDD monitoring plan/1.3/. The information flow (data generation, aggregation, recording, calculation and reporting) for the parameters to be monitored including its values in the final version of the MR/1.2/ have been correctly reported and confirmed. Hence, the requirement of CDM-VVS for v02.0 §§ 360-364 have been met.</p>

E.6.3. Implementation of sampling plan

Means of verification	No sampling plan is defined in the registered approved monitoring plan. All the data and information has been checked during verification assessment, thus no sampling plan has been applied in the Project.
Findings	Not Applicable
Conclusion	Not Applicable

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

Means of verification	As per the monitoring plan in the approved registered PDD/1.3/ the meters are to be tested and calibrated once in 5 years. The project activity metering has been physically inspected during the site visit. The details of monitoring equipment are involved in the project activity and their calibration dates are mentioned in Section C of the final MR and are summarised in the tables below. All the meters are of accuracy class of 0.2s. The assessment team has checked the calibration certificates/5.1/ for accuracy and validity, so as to assure reliability and steadiness of monitoring results. The calibrations results have been verified as below.			
	Cluster Meter at 33kV level: Table-1			
	HTSC No	Meter SL. No	Calibration dates(old meter)	Calibration dates(new meter)
	3376	Old:HT02121081 New: HT2170647	26/08/2013 and 28/11/2017	28/11/2017
	3461	Old: HT2110167 New: HT2170448	02/11/2012 and 30/10/2017	30/10/2017
	3462	Old: HT2110162 New: HT2170444	02/11/2012 and 30/10/2017	30/10/2017
	3463	Old:HT2110156 New : HT2170445	02/11/2012 and 30/10/2017	30/10/2017
	3464	Old: HT2110161 New: HT2170451	02/11/2012 and 30/10/2017	30/10/2017
	3465	Old: HT2110151 New: HT2170232	02/11/2012 and 16/06/2017	16/06/2017
	3466	Old:HT2110149 New: HT2170232	02/11/2012 and 16/06/2017	16/06/2017
	3467	Old:HT2110153 New: HT2170230	02/11/2012 and 16/06/2017	16/06/2017
	3470	Old: HT02121079 New: HT2170453	30/07/2013 and 30/10/2017	30/10/2017
	3500	Old: HT2110146 New: HT2170454	02/11/2012 and 30/10/2017	30/10/2017
	3501	Old: HT2110143 New: HT2170459	02/11/2012 and 30/10/2017	30/10/2017
	3502	Old: HT2110152 New: HT2170391	02/11/2012 and 15/07/2017	15/07/2017
	3503	Old: HT2110166 New: HT2170392	02/11/2012 and 15/07/2017	15/07/2017
	3504	Old: HT2110148 New: HT2170396	02/11/2012 and 15/07/2017	15/07/2017
	3505	Old: HT2110154 New: HT2170394	02/11/2012 and 15/07/2017	15/07/2017
	3506	Old: HT21106168 New: HT2170395	02/11/2012 and 15/07/2017	15/07/2017
	3507	Old: HT02130189	02/11/2012 and	15/07/2017

		New: HT2170389	15/07/2017	
	3508	Old: HT2110163 New: HT2170228	03/11/2012 and 16/06/2017	16/06/2017
	3509	Old: HT02121080 New: HT2170236	30/07/2013 and 16/06/2017	16/06/2017
	3510	Old: HT2110165 New: HT2170227	03/11/2012 and 16/06/2017	16/06/2017
	3511	Old: HT2110158 New: HT2170226	03/11/2012 and 16/06/2017	16/06/2017
	3512	Old: HT2110157 New: HT2170462	03/11/2012 and 30/10/2017	31/10/2017
	3513	Old: HT2110147 New: HT2170225	02/11/2012 and 16/06/2017	16/06/2017
	3514	Old: HT2110150 New: HT2170229	02/11/2012 and 16/06/2017	16/06/2017
	3515	Old: HT2110159 New: HT2170449	02/11/2012 and 30/10/2017	30/10/2017
	3516	Old: HT2110164 New: HT2170446	02/11/2012 and 30/10/2017	30/10/2017
	3517	Old: HT2110142 New: HT2170456	02/11/2012 and 31/10/2017	31/10/2017
	3518	Old: HT2110160 New: HT2170463	02/11/2012 and 31/10/2017	31/10/2017
	3519	Old: HT2110145 New: HT2170457	02/11/2012 and 31/10/2017	31/10/2017
	3528	Old: HT2110155 New: HT2170460	02/11/2012 and 31/10/2017	31/10/2017
	3768	Old: HT2110195 New: HT2170398	02/11/2012 and 15/07/2017	15/07/2017
	3769	Old: HT2110220 New: HT2170291	03/11/2012 and 28/11/2017	28/11/2017
	3770	Old: HT2110196 New: HT2170619	03/11/2012 and 28/11/2017	28/11/2017
	3771	Old: HT2110215 New: HT2170379	02/11/2012 and 18/07/2017	18/07/2017
	3772	Old: HT2110219 New: HT2170639	03/11/2012 and 28/11/2017	28/11/2017
	3773	Old: HT2110216 New: HT2170292	03/11/2012 and 28/11/2017	28/11/2017
	3774	Old: HT2110169 New: HT2170295	03/11/2012 and 28/11/2017	28/11/2017
	3775	Old: HT2110191 New: HT2170296	03/11/2012 and 28/11/2017	28/11/2017
	3776	Old: HT02120218 New: HT2170638	03/11/2012 and 28/11/2017	28/11/2017
	3777	Old: HT2110226 New: HT2170616	03/11/2012 and 28/11/2017	28/11/2017
	3778	Old: HT2110198 New: HT2170293	03/11/2012 and 28/11/2017	28/11/2017
	3779	Old: HT2110223 New: HT2170469	03/11/2012 and 30/10/2017	30/10/2017
	3780	Old: HT2110218 New: HT2170465	03/11/2012 and 30/10/2017	30/10/2017

3781	Old: HT2110224 New: HT2170387	03/11/2012 and 18/07/2017	18/07/2017
3782	Old: HT2110206 New: HT2170429	03/11/2012 and 18/07/2017	18/07/2017
3783	Old: HT2110211 New: HT2170385	03/11/2012 and 18/07/2017	18/07/2017
3784	Old: HT2110192 New: HT2170386	03/11/2012 and 18/07/2017	18/07/2017
3785	Old: HT2110203 New: HT2170382	03/11/2012 and 18/07/2017	18/07/2017
3789	Old: HT2110225 New: HT2170290	03/11/2012 and 28/11/2017	28/11/2017
3790	Old: HT2110224 New: HT2170614	03/11/2012 and 28/11/2017	28/11/2017
3791	Old: HT2110224 New: HT2170297	03/11/2012 and 28/11/2017	28/11/2017

Calibration details for Bulk meter at 110kV level installed at sub-station is as follows:-

Table -2

Meter Serial No.	Make	Meter type	Calibration dates	Due date of calibration
HT1100044	Wallaby	Main Meter	20/04/2015	20/04/2020
HT1100045	Wallaby	Check Meter	20/04/2015	20/04/2020

Replacement of energy meters:

During the on-site visit, the assessment team has observed that all the existing cluster meters installed at 33 kV level were replaced with new meters. The replacement of all the old meters done in accordance with the notification issued by TANGEDCO/5.3/, which is meter and protection division of state utility.

As per the notification all the existing energy meters (TOD/ 0.5s class ABT meter and 0.2s class ABT meter) to be replaced with new 0.2 class DLMS ABT meters.

The assessment team has checked the replacement reports/5.2/ issued by the state utility (TNEB) for each HTSC location, these reports mentions the details of old and new meters including the results obtained through Meter Relay Test (MRT) conducted for both the meters at individual HTSC location.

The healthiness of meters were checked through downloading the data by MRT wing and found that all the parameters such as KWH, KVAH and MD KW were generally in order and meter working condition is also found good/5.2/, The assessment team is able to confirm that the existing and new meters were tested for accuracy at the time of their replacement and installation.

Note: The replacement of the old meters and the calibration of the meters is a subject which falls completely within the purview of the state utility and Project Proponent has no role to play in the same. In this case, old meters with non-DLMS were replaced with new ABT DLMS type accuracy class (0.2%) meters. The state utility found all the replaced meters to be working well within the permissible error limits and the data recorded through the meter before replacement is recorded & used to prepare the monthly generation statement for the concerned month. As a matter of practice, during the MRT testing, if any meter is found to be working within the permissible error limit, the state utility issues the calibration certificate to certify that the meter is working fine. However, they don't mention the achieved error for the respective meters. This is a standard template and practice followed by the state utility and is completely under the control and purview of the state utility only.

As per paragraph 370 of VVS for PAs, "... the DOE shall determine whether the

equipment is calibrated either in accordance with the specifications of the local/national standards or as per the manufacturer's specification..."

In this case, the local/national standards are the standards/templates followed by the state utility, and accordingly, the certificates issued by the state utility, which state that all meters are working within the permissible error limit. Hence the approach followed by the PP to address the calibration delay is in line with the guidelines as outlined under paragraph 366(a) of VVS for PAs version 02.0

Assessment on delay in calibration:

As evident from the calibration details provided in the above table, there is no delay in calibration of meters installed at 110 kV metering points (Bulk meters) identified during the current monitoring period. However, delay in calibration of cluster meters (at 33 kV metering point) is identified in the current monitoring period.

Details of the calibration delay period is provided in below table:

Table-3

Meter location (HTSC number)	Scheduled Date of calibration	Actual date of calibration	Delayed calibration period	Remark
3769,3770,3772 ,3773, 3774, 3775, 3776, 3777, 3778,3789, 3790 and 3791	03/11/2017	28/11/2017	03/11/2017 to 27/11/2017	Error factor of - 0.2% to electricity export values and +0.2% is applied to import and transmission losses for the period 09/10/2017 to 01/12/2017.

Note: It is noted that in the current monitoring period delayed calibration period (03/11/2017 to 27/11/2017) falls under two different billing cycles i.e from 09/10/2017 to 09/11/2017 and 09/11/2017 to 01/12/2017, hence the PP has applied the error factor for the period 09/10/2017 to 01/12/2017, because this period covers entire delayed period. This approach is found to be appropriate and conservative.

The assessment team has checked the latest calibration certificates of energy meters installed at 110 kV metering points and confirmed that meter was working satisfactorily and error within the permissible limits.

It is to be noted that the healthiness of the replaced meters (Table-3) has been checked by downloading the data by MRT wing on the date of replacement and found that all the parameters such as KWH, KVAH and MD KW were generally in order and meter working condition is also found good /5.2/. Hence it can be confirmed that at the time of replacement, the existing meters were working satisfactorily and error was under permissible limits.

Accordance with the guidelines outlined under paragraph 366(a) of CDM VVS for PAs version 02.0, an error factor had to be applied for both export & import i.e. the measured values in the delayed calibration period. However, the monthly "Monthly Statements" issued by the state utility only provides the calculated value of electricity exported, imported and transmission losses for the project activity. Hence the error factor – 0.2% is applied for export values and +0.2% for import and transmission loss values in the entire monitoring period. The approach followed by the PP was found to be conservative and appropriate, hence accepted.

The installation and working condition of the meters were checked during the on-site inspection and it was found to be satisfactory. These meters are duly approved, installed, tested, sealed and in the custody of the state utility. The PP has no control over the same.

CEA Notification No. 502/70/CEA/DP&D dated 17/03/2006/6.3/ which is considered as national standard mentions that "All interface meters shall be tested at least once in five years." Hence, the calibration frequency of once in 5 years, mentioned in the approved registered PDD for the meters is appropriate.

It is verified through the revised approved PDD and PPA signed by the PP with state utility/third party that the state utility is the sole entity responsible for calibration of

	meters.
Findings	CAR #4 was raised and resolved.
Conclusion	<p>Applus+ Certification confirms that the calibration is conducted at the frequency following the relevant national standards as specified by the methodology /2.3/ and the monitoring plan contained in the revised approved PDD /1.3/. Therefore, the requirement of CDM-VVS for PA v02.0 §§ 370 have been met.</p> <p>The assessment team also confirm that the error has been applied:</p> <p>(a) In a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals;</p> <p>(b) For all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.</p>

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	<p>The verification team verified that</p> <ol style="list-style-type: none"> A complete set of data for the monitoring period was available for the monitoring period and the verification of each monitoring parameter is elaborated under Section E.6.2 of this report. The complete monitoring data is also presented in the corresponding ER sheet /4.2/ of final Monitoring Report /1.2/. The information provided in the monitoring report was cross checked with other sources, wherever appropriate and available, and such information is also included under Section E.6.2 of this report. . The calculations of baseline emissions as presented in the corresponding ER sheet of final Monitoring Report were checked and found to be consistent with the formulae and methods described in the registered monitoring plan and the applied methodology. All assumptions used in the emission calculations were found appropriate and therefore justified Appropriate emission factors and other reference values have been correctly applied. This has also been elaborated under Section E.6.1 of this report. No standardized baseline was prescribed in the registered PDD and therefore it has not been applied. There is no pro-rata approach is applied to the calculations of GHG emission reductions in the current monitoring period in as the monitoring period starts after 31 December 2012. <p>The baseline emissions are the product of net electricity supplied to the grid $EG_{PJ,y}$ expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission factor. Baseline emission factor is calculated as combined margin, consisting of a combination of operating margin (OM) and build margin (BM) factors.</p> $BE_y = EG_{PJ,y} * EF_{grid, CM, y}$ <p>Where:</p> <p>BE y: Baseline Emissions in year y; t CO₂</p> <p>$EG_{PJ, y}$: Net electricity supplied to the grid by the project activity</p> $EG_{PJ, y} = EG_{Export-y} - EG_{Import-y} - T_E$ <p>$EF_{grid, CM, y}$ = Combined margin CO₂ emission factor (tCO₂/MWh)</p> <p>As per the revised approved PDD, combined margin emission factor is 0.94515 tCO₂ /MWh. Hence the baseline emissions for the project activity for the current monitoring period are as follows.</p> $BE_y = 180,013.14 * 0.94515 = 170,139 \text{ tCO}_2\text{e (rounded down value)}$ <p>Note:</p> <p>During the current monitoring period, it is noted that end date of each month overlaps with the start date of consecutive month, however despite of overlapping there is no double counting of data because meter reading is taken at a particular time of the day (e.g. 11:30 AM). Hence the period for e.g 12/02/2016 to 10/03/2016</p>
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	would denote reading till that time of 10/03/2016, next period 10/03/2016 to 12/04/2016 denotes reading after that particular time of 10/03/2016. These dates are also reflected in the monthly statement issued by state utility based on which ER calculation is done.
Findings	No non-conformability was observed during assessment for this section. Therefore, no finding was raised.
Conclusion	Applus+ Certification confirms that the requirement outlined under CDM-VVS for v02.0 §§ 374 have been met as: <ul style="list-style-type: none"> • A complete set of data for the monitoring period is available. • Information on the baseline GHG emission calculation provided in the monitoring report /1.2/ has been cross-checked with other sources. • Calculations of baseline emissions have been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology document. • Appropriate emission factor of the power grid has been correctly applied.

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

Means of verification	The approved registered PDD/1.3/ and applied monitoring methodology/2.3/ does not prescribe any project emissions to be considered. The onsite visit and project design also did not reveal any potential source to be considered in this regard.
Findings	No non-conformability was observed during assessment for this section. Therefore, no finding was raised.
Conclusion	No project emissions were required to be calculated.

E.8.3. Calculation of leakage GHG emissions

Means of verification	The approved registered PDD/1.3/ and applied monitoring methodology/2.3/ does not prescribe any leakage emissions to be considered. The onsite visit and project design also did not reveal any potential source to be considered in this regard.
Findings	No non-conformability was observed during assessment for this section. Therefore, no finding was raised.
Conclusion	No leakage emissions were required to be calculated.

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

Means of verification	<p>As elaborated above, the entire emission reductions from the project activity were based on baseline emissions.</p> <p>In line with the applied methodology ACM0002, emission reductions achieved by the project activity is calculated as:</p> $ER_y = BE_y - PE_y$ <p>Where:</p> <p>ER_y = Emission reductions in year y (tCO₂e/yr)</p> <p>BE_y = Baseline emissions in year y (tCO₂/yr)</p> <p>PE_y = Project emissions in year y (tCO₂e/yr)</p> <p>For most renewable power generation project activities, $PE_y = 0$. Hence $ER_y = BE_y$</p> <p>The calculations presented in this regard in the final monitoring report and corresponding ER calculation sheet were found appropriate and complying with the provisions prescribed in the monitoring plan of revised approved PDD and applied methodology.</p> <p>The verification team confirms that an audit trail that contains the evidence and records that validated the stated figures were checked and found acceptable.</p>
Findings	No non-conformability was observed during assessment for this section. Therefore, no finding was raised.

Conclusion	<p>Applus+ Certification confirms that the requirement outlined under CDM-VVS for PA v02.0 §§ 374 have been meet as:</p> <ul style="list-style-type: none"> • A complete set of data for the monitoring period is available. • Information provided in the monitoring report /1.2/ has been cross-checked with other sources; • Calculations of baseline emissions, and project activity emissions and leakage, as appropriate, been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology document. • There are no assumptions in emission reductions calculation. • Appropriate emission factor of the power grid has been correctly applied.
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E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Means of verification	As verified and evident from the final Monitoring Report /1.2/ and corresponding ER sheet /4.2/, the actual emission reductions achieved by the project activity in the current monitoring period were found lower than the estimated quantity in the approved registered PDD/1.3/ for the comparable period. This is largely due to low plant load factor achieved during the current monitoring period.			
	Annual CERs estimated in the approved registered PDD (tCO ₂ e)	Estimated CERs for current monitoring period(691days), tCO ₂ e	Actual CERs achieved in the current monitoring period, tCO ₂ e	Difference
	103,612	196,153	170,139	-13.26%
	Considering, there is no increase in ERs than the estimated amount; it was found acceptable to the assessment team.			
Findings	No non-conformability was observed during assessment for this section. Therefore, no finding was raised.			
Conclusion	<p>Applus+ Certification confirms that the requirement outlined under CDM-PS for PA v02.0 §§ 266 have been meet as:</p> <ul style="list-style-type: none">• A comparison of actual GHG emission reductions or net anthropogenic GHG removal of the project activity achieved during this monitoring period with the estimates in the revised approved PDD /1.3/ has been provided in the Monitoring Report /1.2/.• The verification team confirms that the calculation of the comparison is correct.			

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

Means of verification	<p>The verification team has assessed the cause of any variation in the actual GHG emission reductions achieved during the current monitoring period. There is decrease of 13.26% in the actual emission reductions achieved during the current monitoring period from that stated in the revised approved PDD. This is largely due to low plant load factor achieved during the current monitoring period.</p> <p>It is to be noted that PLF is completely governed by the availability of wind, which is natural phenomenon and it is beyond the control of PP.</p> <p>The actual emission reductions were less than the estimation in the revised approved PDD for an equivalent length of the monitoring period therefore no further explanation is required.</p>
Findings	No non-conformability was observed during assessment for this section. Therefore, no finding was raised.
Conclusion	<p>Applus+ Certification confirms that the requirement outlined under CDM-PS for PA v02.0 §§ 267 and CDM-VVS for PA v02.0 §§ 356 (d) have been meet as:</p> <ul style="list-style-type: none"> • The verified emission reductions are lesser than the estimated value in the monitoring period. The project participants have explained the cause of any decrease in the actual GHG emission reductions achieved during the current monitoring period, and including all information (i.e. data and/or parameters) that is different from that stated in the approved registered PDD /1.3/. • The variation is deemed to be reasonable.

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	Based on the assessment done in section E.8.1 to E.8.6, the verification team is able to certify that the emission reductions from the CDM project activity 4930 “Vaayu India Wind Power Project in Tamilnadu” in India during the first commitment period from 12/02/2016 to 02/01/2018 (including both days) is 170,139 tCO ₂ e.
Findings	No non-conformability was observed during assessment for this section. Therefore, no finding was raised.
Conclusion	Applus+ Certification confirms that the requirement outlined under CDM-PS for PA v02.0 §§ 265 as the project participants has calculated GHG emission reductions.

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

Means of verification	Not applicable
Findings	Not applicable
Conclusion	Not applicable

E.10. Global stakeholder consultation

Means of verification	Not applicable
Findings	Not applicable
Conclusion	Not applicable

SECTION F. Internal quality control

>> As a final step of verification, the final documentation including the verification report has to undergo an internal quality control by the Technical Reviewer. Each report has to be finally approved either by the DOE's Technical Manager or the Deputy. In case one of these two persons is part of the assessment team, the approval can only be given by the person who is not a part of the assessment team. If the documents have been satisfactorily approved, the Request for Issuance is submitted to the CDM-EB along with the relevant documents.

SECTION G. Verification opinion

>> Applus+ Certification has been contracted by Vaayu (India) Power Corporation Private Limited to perform the verification of the emission reductions reported for the CDM project “Vaayu India Wind Power Project in Tamilnadu ” in the period 12/02/2016 to 02/01/2018.

Applus+ Certification concludes that the CDM Project “Vaayu India Wind Power Project in Tamilnadu ”, as described in the monitoring plan contained in the revised approved PDD /1.3/ (Version 10, 03/10/2018) and Monitoring Report /1.2/ (Version 06, 30/10/2019), meets all relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board. The verification is conducted in line with the (CDM-VVS for PA) Version 02.0 /2.1/ requirements. The Project is implemented according to selected monitoring methodology /2.3/ and the revised approved PDD /1.3/. The monitoring equipment was installed, calibrated and maintained in a proper manner. The monitoring system is in place and the Project is generating GHG emission reductions as a CDM project.

Applus+ Certification confirms that the project is implemented in accordance with the validated and revised approved Project Design Document/1.3/ and revised approved monitoring plan. The monitoring system is in place and the emission reductions are calculated without material misstatements. Our opinion relates to the projects GHG emissions and the resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring and its associated documents. Based on the information seen and evaluated we confirm that the implementation of the project has resulted in 170,139 tCO₂e emission reductions during the period 12/02/2016 to 02/01/2018 (both days included).

Applus+ Certification therefore issues the positive verification opinion expressed in the Certification statement in Section H.

SECTION H. Certification statement

>> Applus+ Certification has been engaged by Vaayu (India) Power Corporation Private Limited to perform the sixth periodical verification of the 'Vaayu India Wind Power Project in Tamilnadu ' (UNFCCC Ref. No. 4930).

The management of Vaayu (India) Power Corporation Private Limited is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project's revised approved PDD version 10, dated 03/10/2018, /1.3/ and the applied methodology ACM0002 Version: 12.1.0 /2.3/.

Our verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakesh accord, as well as those defined by the CDM Executive Board. Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. The verification can confirm that:

- the project is operated as planned and described in the project design document approved by the EB;
- the approved monitoring plan is as per the applied methodology;
- the monitoring in Monitoring Report is as per the PDD and the monitoring plan approved by the EB;
- the development and maintenance of records and reporting procedures are in accordance with the approved registered monitoring plan;
- the installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately;
- the monitoring system is in place and generates GHG emission reductions data;
- the GHG emission reductions are calculated without material misstatements.

In our opinion, the GHG emission reductions for 'Vaayu India Wind Power Project in Tamilnadu ' for the monitoring period 12/02/2016 to 02/01/2018 as reported in Monitoring Report, prepared on the basis of the project's Monitoring Plan are fairly stated.

Based on the information we have seen and evaluated, we confirm the following statement:

Reporting period:	From 12/02/2016 to 02/01/2018
Verified emissions in the above reporting period:	
Leakage emissions	00,000 tCO ₂ equivalents
Project emissions	00,000 tCO ₂ equivalents
Baseline emissions	170,139 tCO ₂ equivalents
Emission reductions in this monitoring period (i.e. 12/02/2016 to 02/01/2018)	170,139 tCO ₂ equivalents
Emission reductions achieved during the period up to 31 December 2012.	00,000 tCO ₂ equivalents
Emission reductions achieved during the period from 1 January 2013 onwards. (i.e. 12/02/2016 to 02/01/2018)	170,139 tCO ₂ equivalents

Appendix 1. Abbreviations

Abbreviations	Full texts
ABT	Availability Based Tariff
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CER	Certified Emission Reductions
CL	Clarification Request
CMP or COP/MOP	Conference of Parties serving as the Meeting of the Parties
CMS	Central Monitoring Station
CO ₂	Carbon Dioxide
CoP	Conference of the Parties
DLMS	Device Language Message Specification
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EB	Executive Board
EF	Emission Factor
EPC	Engineering ,Procurement and Construction
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
GoI	Government of India
HCA	Host Country Approval
HTSC	High Temperature Superconductor
ISO	International Organization for Standardization
JMR	Joint Meter Reading
kWh	Kilo watt hour
LCS	Local Controller System
MoC	Modalities of Communications
MP	Monitoring Plan
MR	Monitoring Report
MRT	Meter Relay Test
MW	Mega watt
MWh	Mega Watt hour
O&M	Operation and Maintenance
OM	Operating Margin
PDD	Project Design Document
PP	Project Participant
PPA	Power Purchase Agreement
PRC	Post registration changes
PS	Project standard
QA/QC	Quality Assurance/Quality Control
REC	Renewable Energy Certificates
ROI	Rate of Interest
SLDC	State Load Dispatch Center
TANGEDCO	Tamil Nadu Generation and Distribution Corporation
TNEB	Tamil Nadu Electricity Board
TNERC	Tamil Nadu Electricity Regulatory Commission
TOD	Time of Day
TR	Technical Review
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Validation and Verification Manuel
VVS	Validation and Verification Standard

VCB	Vacuum Circuit Breaker
WEC	Wind Energy Converter
WTG	Wind Turbine Generator
WWIL	Wind World(India) Limited

Appendix 2. Competence of team members and technical reviewers

According to the sectoral scope / technical area and experience in the sectoral or national business environment, Applus+ Certification has composed a project assessment team in accordance with the appointment rules in the internal Quality Management System of Applus+ Certification. The composition of audit team shall be approved by the Applus+ Certification ensuring that the required skills are covered by the team.

The four qualification levels for team members that are assigned by formal appointment rules are as presented below:

- Lead Auditor (LA).
- Auditor (A) / Auditor in Training (AiT).
- Technical Expert (TE).
- Technical Reviewer (TR).

The sectoral scope / technical area knowledge linked to the applied methodology/ies shall be covered by the assessment team.

Name	Qualification	Coverage of scope	Coverage of technical Area	Financial aspect	Host country Experience	Attendance to the On-Site Assessment
Vivek Kumar Ahirwar	Lead Auditor (LA)	Yes (1)	Yes (1.2)	N/A	Yes	Yes
Vivek Kumar Ahirwar	Technical Expert (TE)	Yes (1)	Yes (1.2)	N/A	Yes	Yes
Ravi Kant Soni	Auditor in Training (AiT)	Yes (1)	Yes (1.2)	N/A	Yes	Yes
Simon Shen	Technical Reviewer (TR)/ Technical Expert (TE)	Yes (1)	Yes (1.2)	N/A	N/A	N/A

The curricula vitae of the DOE's team members are provided below:

Vivek Kumar Ahirwar is a BEE-Certified Energy Auditor by Govt of India with over eight years of relevant experience in energy efficiency, energy audit, thermal and electrical energy generation technology from renewable source and energy conservation in energy intensive industries, designated consumers and commercial buildings, implementation of energy conservation building codes, research, process and green building projects. He is a certified lead auditor for ISO 14001 EMS and 14064. He has experience under various categories of projects stating from renewable to waste to supercritical projects and WCD. He has successfully audited more than 100 GHG (CDM/VCS/GS) projects in different states across the India. He has done Master in Technology (Energy Management) from a premier institute, School of Energy & Environmental Studies, DAVV, Indore (M.P.), India and Bachelor of Engineering (Mechanical Engineering) from Govt. Engineering college, Rewa, RGPV, India.

Ravi Kant Soni is a certified lead auditor for Lead Auditor ISO 14001:2004&Lead Auditor ISO 14064:2006 GHG Inventory and verification. He has more than 10 years of work experience across Climate Change, Environmental Management & Monitoring, Health & Safety Management, and Statutory Compliance. He was involved in more than 100 CDM validation and verifications activities and Gold Standard, VER projects as a team leader/technical reviewer / validator / verifier covering the sectoral scope 1 technical area 1.2. He has done Master in Technology (Energy Management) from a premier institute, School of Energy & Environmental Studies, DAVV, Indore (M.P.), India and Bachelor of Engineering (Mechanical Engineering) from M.I.T.S Gwalior Jiwaji University Gwalior, India

Meng (Simon) Shen (Master Degree in Thermal Energy Engineering, Bachelor Degree in Environmental Engineering) is a Lead Auditor appointed by Applus+ LGAI for the GHG project assessment. He is based in Shanghai. He has several years of work experience in environmental protection field. Before he joined Applus+ LGAI, he had been worked for TÜV SÜD as a GHG Validator/Verifier and ISO 9001/14001 Lead Auditor for 5.5 years.

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1.	Basic Documents (Monitoring Report, Project Design Documents, Previous Verification Reports)			
1.0	PP	MR, version 01 (Published)	Dated 25/01/2018	PP
		MR version 02	Dated 15/03/2018	
		MR version 03	Dated 25/01/2019	
		MR version 04	Dated 29/04/2019	
1.1	PP	MR version 05	Dated 23/08/2019	PP
1.2	PP	MR, version (final), version 06	Dated 30/10/2019	PP
1.3	PP	Revised approved PDD Version 10 (Approved on 16/01/2019)	Dated 03/10/2018	PP
1.4	DNV	Validation Report	Report No. 2010-0459 Revision 02 dated 16/06/2011	Other: UNFCCC
1.5	UNFCCC	CDM Project activity view page "Vaayu India Wind Power Project in Tamilnadu " http://cdm.unfccc.int/Projects/DB/DNV/CIUK1308823376.98/view	-	Other: UNFCCC
1.6	ESPL	Verification report for fifth monitoring period (16/06/2015 to 11/02/2016), version 03	Dated 26/10/2016	Other: UNFCCC
1.7	Applus+ Certification	Validation Report on changes in registered PDD, version 04	Dated 14/11/2018	Other: UNFCCC
2.	References and requirements at UNFCCC/IPCC/etc.			
2.1	UNFCCC website	Clean Development Mechanism Validation and Verification Standard for Project Activity (CDM-VVS for PA), version 02.0 as per EB 101, Annex 1	Dated 29/11/2018	Other: UNFCCC
2.2	UNFCCC website	CDM Project Standard for Project Activity (CDM-PS for PA), version 02.0 as per EB 101, Annex 2	Dated 29/11/2018	Other: UNFCCC
2.3	UNFCCC website	Approved Consolidated Methodology ACM0002	Version 12.1.0	Other: UNFCCC
2.4	UNFCCC website	Guidance to Complete "Monitoring Report Form (CDM-MR-FORM), Version 07.0" as accordance with the	Dated 31/05/2019	Other: UNFCCC

		Attachment "Instructions for filling out the monitoring report form"		
3.	Project implementation information			
3.1	State utility	Commissioning certificates issued by Tamil Nadu generation & distribution corporation limited (for all for all 63 WTGs)	-	PP
3.2	State utility	Power Purchase Agreement between TANGEDCO and Vaayu (India) Power Corporation Private Limited	Dated 15/09/2011 (for 24 MW) Dated 30/03/2012 (for 26.4 MW)	PP
		Revised Power Purchase Agreement between Vaayu Renewable Energy (Godavari) Pvt. Ltd and JK Tyre & Industries Limited	Dated 19/11/2015 (for 7 WTGs) Dated 03/11/2016 (for 12 WTGs)	
3.3	State utility	Monthly statement showing the electricity generated through windmills given by Tamil Nadu Electricity Board (TNEB)/ Tirunelveli Electricity Distribution Circle, Tirunelveli (or TANGEDCO)	For the period 12/02/2016 - 02/01/2018	PP
3.4	PP	<ul style="list-style-type: none"> Monthly invoices issued by VIPCPL to GETCO Monthly invoices issued by VREGPL to JK Tyre & Industries Limited 	For the period 12/02/2016 - 02/01/2018	PP
3.5	CEA	CEA CO ₂ Baseline Database for the Indian Power Sector Version 05	-	Other
3.6	Ministry of corporate Affairs, GOI	Name change consent issued by Government of India	Dated 01/01/2013	PP
3.7	WWIL	Monthly Generation Reports issued by O&M contractor	For the period 12/02/2016 - 02/01/2018	PP
4.	ER calculation and cross checking issue			
4.1	PP	Emission reduction calculation sheet, version 01	Dated 25/01/2018	PP
		Emission reduction calculation sheet, version 02	Dated 25/01/2019	
		Emission reduction calculation sheet, version 03	Dated 29/04/2019	
4.2	PP	Emission reduction calculation sheet, version 04	Dated 23/08/2019	PP
5.	Calibration issues			
5.1	State utility	<ul style="list-style-type: none"> Calibration certificates of all the individual energy meters (51 nos) of the registered project activity for the current monitoring period. Calibration certificates of the main and check meter [bulk meters] at the substation for the current monitoring period. <p>The dates of calibration have already been included in the report (Section E.7).</p>	-	PP

5.2	State utility	Meter replacement certificates of old meters installed the HTSC Nos-3769,3770,3772,3773, 3774, 3775, 3776, 3777, 3778,3789, 3790 and 3791	-	PP
5.3	State utility	Notification issued by state utility regarding replacement of energy meters	Dated 08/02/2016	PP
6.	Others			
6.1	Applus+ Certification	Site Visit Attendance Sheet	23/02/2018	-
6.2	Applus+ Certification	Site Visit Photograph	-	-
6.3	CEA	Central Electricity Authority (Installation and Operation of Meters) Regulations - Notified on 17/03/2006 No.502/70/CEA/DP&D - AmendmentsNotifiedon26/06/2010No.502/6/2009/DP &D/D-I (http://www.cea.nic.in/reports/regulation/meter_reg.pdf)	17/03/2006	Other: CEA

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

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

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

Table 2. CL from this verification

CL ID	01	Section no.	E	Date : 25/02/2018
Description of CL				
<ol style="list-style-type: none"> 1. Please submit the relevant evidence regarding the ownership change of the project activity from "Vaayu (India) Power Corporation Pvt. Ltd" to "Vaayu renewable energy Godavari Pvt. Ltd." 2. It is not clear which project owner is referred in the line diagram under section C of the MR. 3. Please clarify why reference number of PRC is not mentioned in section B.2.5 of the MR in line with instructions to fill CDM-MR-FORM. 				
Project participant response				Date :15/03/2018

1. The JMR for the month of Feb & March 2016 reflects the ownership change for the particular machines. Also, the PPA of the transferred machines reflects the name change. The documents are submitted to DOE for further verification.
2. The line diagram under the section C of the MR refers to the entire project as a whole, thus it refers to the machines owned by both the parties VPCPL & VREGPL. As there is no physical change in location, power evacuation systems, metering points etc, hence the same line diagram can be considered as applicable for the project after the ownership change as well. A foot note reference (#3) is included to clarify the same.
3. The PRC related reference was included in the footnote (#2) link; however, the section B.2.5 is now revised and PRC reference number is included.

Documentation provided by project participant

- 1) JMR copies and PPAs
- 2) Revised MR, version 02, 15 Mar 2018

DOE assessment**Date:** 20/01/2019

1. The PP has submitted the JMR for the month of Feb & March 2016 and the PPA of the transferred machines reflects the name change, found to be appropriate, hence accepted.
2. Line diagram provided in section C of the MR is not consistent with the same provided under section B.7.3 of the revised PDD.
3. Reference number of PRC is not mentioned in section B.2.5 of the MR in line with instructions to fill CDM-MR-FORM.

CL #1 is open

Project participant response**Date:** 28/01/2019

2. The line diagram included in the section C of the MR has been revised as per the section B.7.3 of the approved revised PDD, version 08, dated (approved by UNFCCC on 16 Jan 2019)
3. The PRC was not approved during the last submission of the MR (version 02). However, PRC has been approved now and hence PRC reference number is included under the section B.2.5 of the MR.

Documentation provided by project participant

Revised MR, version 03, 25 Jan 2019.

DOE assessment**Date:** 10/02/2019

Line diagram is modified in section C of the MR and found in line with the same provided under section B.7.3 of the revised approved PDD, hence accepted.

Reference number of PRC is reported in section B.2.5 of the MR in line with instructions to fill CDM-MR-FORM.

CL #1 is closed.

CL ID	02	Section no.	E.1	Date: 12/07/2019
Description of FAR				
Please clarify why latest version of CDM.-MR-FORM is not used for the project activity.				
Project participant response				Date: 23/08/2019
PP would like to clarify that at time of earlier submissions, the latest available version of the MR template was 06; however, currently applicable version is 07. Hence PP has updated the MR to the latest version 07 of the template. Please refer to the MR version 05 dated 30 July 2019.				
Documentation provided by project participant				
Revised MR version 05, dated 23/08/2019 (as per version 07 of the MR-Form).				
DOE assessment				Date: 30/09/2019
The PP has referred latest version of CDM.-MR-FORM for revised MR, found to be satisfactory, hence accepted.				
CL #2 is closed.				
CL #2 re-opened				Date: 29/10/2019

Description of CL	
Name of one project participant mentioned (ACT commodities) at page 1 of the MR is not consistent with the UNFCCC project web page. Location map of the project activity is not provided under section A.2 of the MR.	
Project participant response	Date: 30/10/2019
PP has revised name of project participant mentioned (ACT Financial Solutions B.V.) at page 1 of the MR as per UNFCCC project web page. PP has included location map of the project activity under section A.2 of the MR.	
Documentation provided by project participant	
MR version 06 ,dated 30/10/2019	
DOE assessment	Date: 31/10/2019
Name of one project participant (ACT commodities) is corrected at page 1 of the MR and found consistent with the UNFCCC project web page. Location map of the project activity is added in section A.2 of the MR, found satisfactory. CL #2 is closed.	

Table 3. CAR from this verification

CAR ID	01	Section no.	B.2	Date : 25/02/2018
Description of CAR				
Please clarify why the ownership change is not considered as post registration changes to the registered project activity and same is not described in section B.2 of the MR.				
Project participant response				Date :15/03/2018
During the current monitoring period, there is a permanent change in the project activity as out of the 63 registered WTGs, the ownership of 19 WTGs had been changed from "Vaayu (India) Power Corporation Pvt. Ltd." to "Vaayu renewable energy Godavari Pvt. Ltd." w.e.f. March 2016. Therefore, a request for post registration change is being submitted to UNFCCC along with this verification to address the change. As this ownership change is permanent and is not related to any physical change to monitoring plan, methodology, baseline etc. therefore it is considered as "Correction" and hence is reported under this section B.2.2.				
Documentation provided by project participant				
Revised MR, version 02, 15 Mar 2018				
DOE assessment				Date:20/01/2019
Post registration changes relevant to ownership and permanent changes in the monitoring plan are approved on 16/01/2019. Please clarify this information is not provided in the MR and relevant sections are not updated accordingly. CAR #1 is open				
Project participant response				Date: 28/01/2019
PP would like to clarify that the PRC request was under process at the time of submission of the previous monitoring report (i.e. version 02), therefore the information provided in the previous MR was not in line with the final approved details of the revised PDD (approved on 16/01/2019). However, the information in the MR has been now revised appropriately in line with the revised PDD. Please refer to the version 03 of the MR.				
Documentation provided by project participant				
Revised MR, version 03, dated 25 Jan 2019.				
DOE assessment				Date: 10/02/2019
Post registration changes relevant to ownership and permanent changes in the monitoring plan are approved on 16/01/2019 and the PP has updated the relevant sections of the MR including the information's in line with the revised approved PDD, hence accepted. CAR #1 is closed.				

CAR ID	02	Section no.	E.6.2	Date : 25/02/2018
Description of CAR				
Please submit ER calculation sheet for the current monitoring period.				
Project participant response				Date : 15/03/2018
<p>ER sheet for the current monitoring period is submitted to DOE.</p> <p>PP would like to further clarify that the ER related values mentioned in the first version of the MR was incorrect as few data in the ER sheet was wrongly accounted. Therefore, the submitted ER sheet contains the actual/corrected data. The values in the revised MR (version 02, dated 15 March 2018) have been corrected as per the ER sheet.</p>				
Documentation provided by project participant				
<i>ER sheet, version 01, 19 Jan 2018.</i>				
DOE assessment				Date:20/01/2019
<p>The PP has submitted the ER calculation sheet; however cross checking of the parameter net electricity supplied to the grid by the project activity is not demonstrated in line with the provisions of revised approved monitoring plan.</p> <p>CAR #2 is open</p>				
Project participant response				Date : 28/01/2019
<p>PP has revised the MR in line with the cross checking procedure prescribed in the revised PDD (approved on 16/01/2019).</p> <p>PP would like to intimate that as per the revised approved PDD: "In order to establish a proper cross checking method it has been proposed that the total monthly value of net export calculated from monthly statement shall be cross checked with the monthly invoice raised to third party by VREGPL. And this shall be the primary cross checking mechanism. Further (as a further reference point for cross checking, if required by DOE), the net electricity export from the 19 WEGs of VREGPL can be compared with the readings of their LCS meters after deducting import and transmission loss."</p> <p>Therefore, as a part of the primary cross checking mechanism all monthly invoices were submitted to DOE. Also, for the further reference point for cross checking related to the 19 WEGs of VREGPL, LCS meter readings are submitted to DOE in a separate sheet. And for comparison purpose the calculation is provided for LCS reading after deducting import and transmission losses.</p>				
Documentation provided by project participant				
<p>Revised MR, version 03, dated 25 Jan 2019</p> <p>Revised ER, version 02, dated 25 Jan 2019</p> <p>Cross Check Reference sheet, version 01, 25 Jan 2019</p>				
DOE assessment				Date : 10/02/2019
<p>Revised ER sheet is checked and it is observed that cross checking mechanism of the parameter net electricity supplied to the grid by the 19 WTGs (transferred to other entity) of project activity is not demonstrated in line with the provisions of revised approved monitoring plan. Please clarify the same.</p> <p>Cross Check Reference sheet, version 01, 25 Jan 2019 is missing in the submission. Please resubmit the same.</p> <p>CAR #2 is open</p>				
Project participant response				Date : 22/05/2019
<p>PP has revised ER sheet as per cross checking mechanism as described in MR. The parameter net electricity supplied to the grid by the 19 WTGs (transferred to other entity) of project activity is demonstrated in line with the provisions of revised approved monitoring plan.</p> <p>PP would also like to inform that most conservative approach has been adopted for calculating the final ER. The net export for each month has been calculated based on JMR/TNEB statements. Similar, separate net export values were also calculated based on LCS readings for all the months. The LCS readings have been taken for each month and calculated net export for that month by deducting Import and line losses. Then minimum of the two values (i.e. net export derived from JMR/TNEB statement and net derived based on LCS readings) have been considered for ER calculation purposes. Please refer to the ER sheet for details.</p>				

Documentation provided by project participant	
UN4930_MR-v6_Ver04 ER sheet, version 03, dated 29/04/2019	
DOE assessment	Date : 31/05/2019
Cross checking mechanism for the parameter net electricity supplied to the grid by the 19 WTGs (transferred to other entity) of project activity is demonstrated in the revised ER sheet and found to be in line with the provisions of revised approved monitoring plan, hence accepted. CAR #2 is closed.	

CAR ID	03	Section no.	E.6.3	Date : 25/02/2018
Description of CAR				
Please submit the following documents:				
<ol style="list-style-type: none"> 1. Commissioning certificates and PPA 2. Monthly statement showing the electricity generated through windmills given by Tamilnadu Electricity Board covering the current monitoring period 3. Monthly invoices issued to TNEB covering the current monitoring period 				
Project participant response				Date : 15/03/2018
The required documents are submitted to DOE in soft copies. Original copies were produced during the onsite verification visit.				
Documentation provided by project participant				
<ol style="list-style-type: none"> 1) Commissioning certificates. 2) PPA (old and new after ownership change) 3) Monthly JMR copies 4) Monthly invoices 				
DOE assessment				Date:20/01/2019
The PP has submitted the requested documents, found to be appropriate, hence accepted. CAR #3 is closed.				

CAR ID	04	Section no.	E.7	Date: 12/07/2019
Description of FAR				
Please clarify why calibration dates of old meters are not reported in section C of the monitoring report. As per the details provided in the MR, calibration of substation meters were due in December 2017, however the current monitoring period end on 02/01/2018. In view of this information please clarify how it is ensured that meters were working satisfactorily during the current monitoring period.				
Project participant response				Date: 23/08/2019
PP would like to clarify that in the year 2017 (from June to November), all meters were replaced with new set of meters (exact date of respective meter replacements are given in the table under the MR); whereas most of the old meters were due for calibration by Nov 2017 and a few in Aug 2018. There was delay in calibration of energy meters for HTSC number 3769, 3770,3772, 3773, 3774, 3775, 3776, 3777, 3778, 3789, 3790 and 3791 in the year 2017. In year 2017, the scheduled date of calibration was 03/11/2017 and the actual date of calibration was 28/11/2017. Therefore, PP has applied maximum error factor (-0.2% to export, +0.2% to import & transmission loss) in all measured values taken for the period 09/10/2017 to 01/12/2017, because billing cycle dates does not coincide with the delayed calibration period and hence following the conservative approach, error factor is applied to the mentioned period.				
Documentation provided by project participant				
Revised ER sheet, version 04, dated 23/08/2019 Revised MR version 05, dated 23/08/2019.				
DOE assessment				Date: 30/09/2019

The PP has reported the calibration dates of old meters are not reported in section C of the monitoring report, found consistent with the calibration certificates.

It is noted that in the current monitoring period calibration of the meters installed at HTSC number 3769, 3770, 3772, 3773, 3774, 3775, 3776, 3777, 3778, 3789, 3790 and 3791 got delayed for the from 03/11/2017 to 27/11/2017. Since this delayed period falls under two different billing cycle's i.e from 09/10/2017 to 09/11/2017 and 09/11/2017 to 01/12/2017, hence the PP has applied the error factor for the period 09/10/2017 to 01/12/2017, because this period covers entire delayed period. This approach is found to be appropriate, conservative and in line with the guidelines provided under paragraph 366 (a) of CDM VVS for PAs version 02.0, hence accepted.

CAR #4 is closed.

Table 4. FAR from this verification

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>
03.0	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 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.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: project activities, verifying and certifying		