



VOLUNTARY CARBON STANDARD 2007.1

VERIFICATION REPORT

BUNDLED WIND POWER PROJECT IN TAMIL NADU MANAGED BY ENERCON INDIA LIMITED-II

**Monitoring Period: 8/10/2009 to 15/09/2010
(incl. both days)**

Report No: 8107214388-10/474

Date: 2011-01-19



Name of Verification company:	Date of the issue:
TÜV NORD CERT GmbH	2011-01-19
Report Title:	Approved by:
Bundled Wind Power Project in Tamil Nadu managed by Enercon India limited-II	Rainer Winter
Client:	Project Title:
Enercon (India) Limited	Bundled Wind Power Project in Tamil Nadu managed by Enercon India limited-II
Summary:	
Enercon (India) Limited has commissioned the TÜV NORD JI / CDM Certification Program to carry out the verification of the project “Bundled Wind Power Project in Tamil Nadu managed by Enercon India limited-II” at Pushpathur site in Dindigull district and Chinnakkampalayam in Erode district of Tamil Nadu, India with regard to the requirements of VCS 2007.1 Standard. The main purpose of the project activity is to generate fuel free carbon neutral electricity through sustainable means using wind power resources and use the state transmission grid (TNEB) for captive consumption , thereby displacing electricity of the Southern regional grid of India that would have been generated predominantly from fossil fuel based power generation. A risk-based approach has been followed to perform this verification. In the course of the validation 08 Corrective Action Requests (CARs) and no Clarification request were raised which are successfully closed out. There are no FAR raised during the verification period. As per the registered VCS PD the online panel meter will be calibrated annually. However, the panel meter does not need any calibration as it is software based integrated system which has been specially designed for control of wind turbines, where control functions, data collection and storage, real time grid monitoring and storage function are integrated. The verification team has cross checked the same from the technological supplier manual and thus the deviation is accepted to the verification team. Furthermore, one more clarification was sought regarding monitoring of electricity generated (apportioning) was detected during verification process. During the site visit and subsequent interview with client, it is confirmed that apportioning is not required for the calculation of electricity exported and electricity imported and the dedicated meters are installed for electricity exported and electricity imported. Thus the deviation is acceptable to the verification team. The verification is based on the draft monitoring report/MR1/, revised monitoring	

report/MR2/, the monitoring plan as set out in the validated PD/VCSPD/, the validation report/FvalR/, emission reduction calculation spreadsheet/XLS1/,/XLS2/ and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

As the result of the 2nd periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period of 8/10/2009 to 15/09/2010 as follows:

Emission reductions 53,466 tCO2 equivalents

Work carried out by:	Number of pages:
Mr. Manojkumar Borekar Mr. Prasad Jakkaraju Mr. Jimmy Sah Mr. Sukanta Das Mr. Ajay Singh Thakur	39

Abbreviations

BAU	Business as usual
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CO₂	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
CP	Certification Program
CL	Clarification Request
CTPT	Current Transformer and Potential Transformer
DNA	Designated National Authority
EB	CDM Executive Board
EIA	Environmental Impact Assessment
EIL	Enercon India Limited
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
ISO	International Standardisation Organisation
kWh	Kilowatt hour
MP	Monitoring Plan
MR	Monitoring Report
MWh	Megawatt hour
PP	Project Participant
QC/QA	Quality control/Quality assurance
TNEB	Tamil Nadu Electricity Board
VCS	Voluntary Carbon Standard
VCS - PD	VCS - Project Description
VCU	Voluntary Carbon Unit
VVM	Validation and Verification Manual

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1 INTRODUCTION

The Enercon India Limited has commissioned the TÜV NORD JI/CDM Certification Program to carry out the verification of the project: “Bundled Wind Power Project in Tamil Nadu managed by Enercon India limited-II” with regard to the relevant requirements of the Voluntary Carbon Standard 2007.1^{/VCS/}. The verifiers have reviewed the implementation of the monitoring plan (MP) in the registered VCS project for the monitoring period 8/10/2009 to 15/09/2010.

The applied monitoring methodology is ACM0002 version 10 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”.

1.1 Objective

The purpose of this verification, by independent checking of objective evidence, is as follows:

- to verify that the project is implemented as described in the project design document;
- to assess the implementation of the monitoring plan (MP) content in the VCS-PD;
- to assess the project’s compliance with other relevant rules, including the host country (India) legislation;
- to confirm that the monitoring system is implemented and fully functional to generate voluntary emission reductions (VERs / VCUs) without any double counting; and
- to establish that the data reported are accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emissions reduction calculation.

1.2 Scope and Criteria

The verification of this project is based on the validated project design document^{/VCS-PD/}, the monitoring report^{/MR2/}, emission reduction calculation spread sheet^{/XLS1/}, supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment. Furthermore publicly available information was considered as far as available and required.

The TÜV NORD JI/CDM CP has employed a risk-based approach in the verification, focusing on the identification of significant risks and reliability of project monitoring and generation of emission reductions.

1.3 VCS Project Description

1.3.1 Project Characteristics

Essential data of the project is presented in the following Table 1-1.

Table 1-1: Project Characteristics

Item	Data
Project title	Bundled Wind Power Project in Tamil Nadu managed by Enercon India limited-II
Project owner	Enercon (India) Limited
Any specific project categories	☐ Mega project ($> 10^6$ t CO _{2eq} / a) ☒ Project (5,000-1,000,000 tCO _{2e} per year) ☐ Micro project (< 5000 t CO _{2eq} / a) ☐ AFOLU project ☐ Grouped project ☐ No specific project category
VCS PD dated	Draft: - Final: 2007-07-06
Applied Methodology	ACM0002 Version 10
Project starting date	2006-01-17
Crediting period	☐ Renewable Crediting Period (7 y) ☒ Fixed Crediting Period (10 y)
Start of crediting period	2006-04-01

1.3.2 Project Location

The details of the project location are given in table 1-2:

Table 1-2: Project Location

No.	Project Location
Host Country	India
Region:	Tamil Nadu
Project location address:	Pushpathur site in Dindigull district and Chinnakkampalayam in Erode district
Latitude:	Described for each WEC under section 1.3.3
Longitude:	Described for each WEC under section 1.3.3

1.3.3 Technical Project Description

The project under consideration is set up to produce clean power from the wind electric converters. The generated electricity is wheeled using the state transmission system for captive consumption. The Project leads to reduced Greenhouse Gas (GHG) emissions because it displaces electricity from fossil fuel based electricity generation plants. The project is helping in bridging the demand supply gap by using wind as a source of generating electrical energy.

The project activity consists of the 45 machines of Enercon make of 800 KW each, aggregating to the capacity of 36 MW. The project considered harnessed renewable resources in the region, thereby displacing non-renewable natural resources thereby ultimately leading to sustainable economic and environmental development. Enercon (India) Ltd (“Enercon” or “EIL”) is the equipment supplier and the operations and maintenance contractor for the project

The emission reduction for the reported monitoring period is based on net electricity of 57681.964 MWh supplied to TNEB grid which is connected to the Southern regional grid of India and the validated ex-ante grid emission factor (0.92694 tCO_{2e}/MWh) ^{/cea/,FVR/} of southern regional grid is in accordance with methodology ACM0002 version: 10 ^{/ACM0002/}. The Net electricity supplied from project activity was calculated as the difference between electricity exported to the grid and the electricity imported from the grid which are derived from the continuously measured export and import electricity meters respectively. The net electricity supplied to the grid is the basis of the emission reduction calculation.

Each meter is a two way tri-vector export-import meter installed by TNEB at the high voltage side of the step up transformer installed at the Project site. The metering is done at 22 kV bay by two-way export meter installed by TNEB. These continuous meters provide cumulative readings in kWh and were calibrated before installation by TNEB as per the TNEB guidelines confirming the regulations of the Central Electricity Authority. The meter for HTSC No: D29 (Premier Fine Yarns Pvt. Ltd) was replaced in 07/06/2010. Similarly for HTSC No: D78 (Coimbatore Polytex) was also replaced in 09/02/2010. During the replacement of the meter there was no generation from the Wind Turbine (Shut down)^{/BR/} thus no discrepancies were found in the emission reduction calculation.

The installed meters measure the electricity export and electricity import for each WEC of the project which are designated by unique identification no. i.e. HT SC (High Tension Service Connection) No. which was verified on-site and was found to be correct.

The project activity is located Pushpathur site in Dindigull district and Chinnakkampalayam in Erode district in state of Tamil Nadu. The following table gives the detail description of the commissioning date of WECs and their respective latitude and longitudes.

SI NO.	Customer Name	Feed ers	EB Substation	HTSC Numb er	UIN
1	Premier Spinnings and Weaving Mills Pvt.Ltd.	E-3	Melkaraipatti (110/22KV)	D47	PSWMPLP U-09
2	Premier Spinnings and Weaving Mills Pvt.Ltd.	E-6	Melkaraipatti (110/22KV)	D49	PSWMPLP U-08
3	Premier Spinnings and Weaving Mills Pvt.Ltd.	Visco se	Melkaraipatti (110/22KV)	D52	PSWMPLP U-10
4	Premier Spinnings and Weaving Mills Pvt .Ltd.	E-3	Melkaraipatti (110/22KV)	D54	PSWMPLP U-05

5	Premier Spinnings and Weaving Mills Pvt.Ltd.	E-6	Melkaraipatti (110/22KV)	D79	PSWMPLP U-06
6	Premier Spinnings and Weaving Mills Pvt.Ltd.	E-6	Melkaraipatti (110/22KV)	D80	PSWMPLP U-07
7	Premier Spinnings and Weaving Mills Pvt.Ltd.	E-3	Melkaraipatti (110/22KV)	D81	PSWMPLP U-03
8	Premier Spinnings and Weaving Mills Pvt .Ltd.	E-2	Thalaiyoothu (110/22KV)	D82	PSWMPLP U-02
9	Premier Spinnings and Weaving Mills Pvt .Ltd.	E-2	Thalaiyoothu (110/22KV)	D83	PSWMPLP U-01
10	Premier Spinnings and Weaving Mills Pvt .Ltd.	E-2	Thalaiyoothu (110/22KV)	D84	PSWMPLP U-04
11	Premier Fine Yarns P Ltd	E-1	Thalaiyoothu (110/22KV)	D26	PMPLPU-03
12	Premier Fine Yarns P Ltd	GVG	Thalaiyoothu (110/22KV)	D27	PMPLPU-04
13	Premier Fine Yarns P Ltd	Visco se	Thalaiyoothu (110/22KV)	D28	PMPLPU-01
14	Premier Fine Yarns P Ltd	E-1	Thalaiyoothu (110/22KV)	D29	PMPLPU-02
15	Premier Fine Yarns P Ltd	E-2	Thalaiyoothu (110/22KV)	D30	PMPLPU-05
16	Premier Fine Yarns P Ltd	E-2	Thalaiyoothu (110/22KV)	D30	PMPLPU-06
17	Premier Fine Yarns P Ltd	E-2	Thalaiyoothu (110/22KV)	D32	PMPLPU-07
18	Premier Fine Yarns P Ltd	E-2	Thalaiyoothu (110/22KV)	D32	PMPLPU-08
19	Premier Fine Yarns P Ltd	E-1	Thalaiyoothu (110/22KV)	D33	PMPLPU-09
20	Premier Fine Yarns P Ltd	E-1	Thalaiyoothu (110/22KV)	D34	PMPLPU-10
21	Coimbatore Polytex Pvt.Ltd	Visco se	Melkaraipatti (110/22KV)	D37	CPPLPU-03
22	Coimbatore Polytex Pvt.Ltd	Visco se	Melkaraipatti (110/22KV)	D38	CPPLPU-02
23	Coimbatore Polytex Pvt.Ltd	GVG	Melkaraipatti (110/22KV)	D43	CPPLPU-01
24	Coimbatore Polytex Pvt.Ltd	GVG	Melkaraipatti (110/22KV)	D43	CPPLPU-04
25	Coimbatore Polytex Pvt.Ltd	GVG	Melkaraipatti (110/22KV)	D44	CPPLPU-05
26	Coimbatore Polytex Pvt.Ltd	GVG	Thalaiyoothu (110/22KV)	D45	CPPLPU-06

27	Coimbatore Polytex Pvt.Ltd	E-2	Melkaraipatti (110/22KV)	D68	CPPLPU-07
28	Coimbatore Polytex Pvt.Ltd	E-2	Melkaraipatti (110/22KV)	D73	CPPLPU-10
29	Coimbatore Polytex Pvt.Ltd	E-2	Melkaraipatti (110/22KV)	D74	CPPLPU-08
30	Coimbatore Polytex Pvt.Ltd	E-2	Melkaraipatti (110/22KV)	D75	CPPLPU-09
31	Coimbatore Twisters Pvt. Ltd.	E-2	Melkaraipatti (110/22KV)	D78	CTPLPU-01
32	Bannari Amman Spinning Mills Ltd.	E -3	Chinnaputhur (110/22 KV)	1067	BASMLDH-01
33	Bannari Amman Spinning Mills Ltd.	E-3	Chinnaputhur (110/22 KV)	1068	BASMLDH-02
34	Bannari Amman Spinning Mills Ltd.	E-3	Chinnaputhur (110/22 KV)	1069	BASMLDH-03
35	Bannari Amman Spinning Mills Ltd.	E-7	Chinnaputhur (110/22 KV)	1070	BASMLDH-09
36	Bannari Amman Spinning Mills Ltd.	E-7	Chinnaputhur (110/22 KV)	1070	BASMLDH-10
37	Bannari Amman Spinning Mills Ltd.	E-7	Chinnaputhur (110/22 KV)	1071	BASMLDH-11
38	Bannari Amman Spinning Mills Ltd.	E-7	Chinnaputhur (110/22 KV)	1072	BASMLDH-13
39	Bannari Amman Spinning Mills Ltd.	E-7	Chinnaputhur (110/22 KV)	1072	BASMLDH-14
40	Bannari Amman Spinning Mills Ltd.	E-7	Chinnaputhur (110/22 KV)	1073	BASMLDH-12
41	Bannari Amman Spinning Mills Ltd.	E-3	Chinnaputhur (110/22 KV)	1077	BASMLDH-04
42	Bannari Amman Spinning Mills Ltd.	E-3	Chinnaputhur (110/22 KV)	1077	BSAMLDH-08
43	Bannari Amman Spinning Mills Ltd.	E-3	Chinnaputhur (110/22 KV)	1086	BASMLDH-07
44	Bannari Amman Spinning Mills Ltd.	E-7	Chinnaputhur (110/22 KV)	1106	BASMLDH-05
45	Bannari Amman Spinning Mills Ltd.	E-7	Chinnaputhur (110/22 KV)	1106	BASMLDH-06

The key parameters of the project are given in table 1-3:

Table 1-3a: Technical data of the project activity.

Parameter	Unit	Value
Turbine Model		Enercon E- 48,
Rated power	kW	800,
Cut-in wind speed	m/s	3
Rated wind speed	m/s	12
Cut-out wind speed	m/s	28-
Extreme wind speed	m/s	59.5
Rated rotational speed	rpm	18-
Operating range rotational speed	rpm	12-
Number of blades	-	3

Table 1-3b: Parameters confirmed during verification

Parameter	Name	Unit	Value
EG _{export}	Electricity exported to the grid by the project activity. 1.3.4	MWh	57839.706
EG _{import}	Electricity imported from the grid by the project activity.	MWh	157.744
EG _y	Net electricity supplied to the grid by the project.	MWh	57681.962
EG _{Gross,y}	Total electricity generation by the wind mills during the year y	MWh	61765.373

1.3.5 Appointment of team members and technical reviewer

On the basis of a competence analysis and individual availabilities a verification team was appointed. Furthermore also the personnel for the technical review and the final approval was determined.

The list of involved personnel, the tasks assigned and the qualification status are summarized in the table 1-4 below.

Table 1-4: Involved Personnel

	Name	Company	Function ¹⁾	Qualification Status ²⁾	Sectoral competence	Technical competence	Host country Competence	Controlling competence
☒ Mr. ☐ Ms.	Manojkumar Borekar	TUV India Pvt.Ltd.	TL	SA	☒	T	☒	☒
☒ Mr. ☐ Ms.	Prasad Jakkaraju	TUV India Pvt.Ltd.	TM	E	☒	T	☒	☐
☒ Mr. ☐ Ms.	Jimmy Sah	TUV India Pvt.Ltd.	TM	E	☒	-	☒	☐
☒ Mr. ☐ Ms.	Sukanta Das	TUV India Pvt.Ltd.	TM	E	☒	-	☒	☐
☒ Mr. ☐ Ms.	Ajay Singh Thakur	TUV India Pvt.Ltd.	-	T	☐	-	☒	☐
☒ Mr. ☐ Ms.	Ingo Klein	TN CERT	TR ³⁾	A	☒	T	☐	☒
☒ Mr. ☐ Ms.	Rainer Winter	TN CERT	FA	SA	☒	T	☐	☒

¹⁾ TL : Team Leader; TM : Team Member, TR: Technical review; FA: Final approval;

²⁾ GHG Auditor Status: A : Assessor; E : Expert; SA: Senior Assessor; T : Trainee; TE Technical Expert

³⁾ No team member

⁴⁾ As per S01-MU03 or S01-VA070 A2 (such as A, B, C.....)

1.4 Level of Assurance

The verification has been planned and organized to achieve a

☒ reasonable level of assurance

☐ limited level of assurance.

The verification report is based on VCS-PD^{/VCS-PD/}, Monitoring report^{/MR1/,/MR2/} and Final Validation Report^{/FVR/}, supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment. The verification opinion is assured provided the credibility of all above.

2 METHODOLOGY

The verification of the project consisted of the following steps:

- Contract review
- Appointment of team members and technical reviewers
- Publication of the monitoring report
- Desk review of the Monitoring Report^{/MR/} submitted by the client and additional supporting documents.
- Verification planning,
- On-Site assessment,
- Background investigation and follow-up interviews with personnel of the project developer and its contractors,
- Draft verification reporting
- Resolution of corrective actions (if any)
- Final verification reporting
- Technical review
- Final approval of the verification.

The sequence of the verification is given in the table 2.1 below:

Table 2.1: Verification sequence

Topic	Time
Assignment of verification	2010-10-07
On-site visit	2010-10-19
Draft reporting finalised	2010-10-22
Final reporting finalised	2010-11-12
Technical review on final reporting finalised	2011-01-19
Final corrections	2011-01-19

The main verification steps are described below.

2.1 Review of Project Documentation

The VCS PD^{/PD/} and supporting background documents related to the project design and baseline were reviewed.

Furthermore, the verification team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data. The references used in the course of this verification are summarized in section 5.

2.2 On-Site Assessment

2.2.1 Review of Performance Records

The present verification is 2nd periodic verification of the project activity. During the site visit It was found that the implementation of the project activity is as per the registered VCD PD.

During the site visit performance record of the equipment installed on site and monitoring system reviewed by the verification team, such as

- Performance of WTGs involved in the project activity
- Brack down and maintanance record during monitoring period
- Preformance of meters installed for electrtcity generation
- Training records of persons responsible for operation and maintanace. etc.

The verification team has also checked the verification report of the project activity and found that there are no remaining issues from the previous verifications of project activity. The overall performance of the project activity is assessed to be correct.

2.2.2 Follow-up Interviews

The verification team has carried out interviews in order to assess the information included in the project documentation and to gain additional information regarding the compliance of the project with the relevant criteria applicable for the VCS. The verification site visit was carried out on 2010-10-19.

During verification the verification team has performed interviews to confirm selected information and to resolve issues identified in the document review. The main topics of the interviews are summarized in Table 2-2.

Table 2-2: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
Project proponent representatives • /IM01/	- General aspects of the project - Technical equipment and operation - Changes since validation - Monitoring and measurement equipment - Remaining issues from validation / previous verifications - Calibration procedures - Quality management system - Involved personnel and responsibilities - Training and practice of the operational personnel - Implementation of the monitoring plan - Monitoring data management - Data uncertainty and residual risks - GHG calculation - Procedural aspects of the verification - Maintenance - Environmental aspects - Editorial issues of the Monitoring Report

A comprehensive list of all interviewed persons is part of section 5 'References'

2.2.3 Collection of Measurements

During the on-site visit the verification team has collected and reviewed evidences of original measurement results, as obtained by the installed monitoring system. Furthermore all systems and procedural steps involved in the data aggregation have been checked in detail and corresponding data has been collected in order to enable the conceptualized detailed audit testing procedures.

2.2.4 Observation of established practices and testing of the accuracy of monitoring equipment

The general conditions set out for metering, recording, meter readings, meter inspections, Test & Checking and communication are as per the agreement with TNEB.

The WECs generate 3-phase power at 400 V, which is stepped up to 22 kV by the step up transformer. A two-way export-import meter is installed to measure the electricity export and import for each WEC or group of WECs in the project activity which is designated by unique identification no. i.e HTSC No. The project activity has

the dedicated metering system and there are no other WEGs connected to the joint meters of the project activity.

The meter is tested for accuracy with reference to a portable standard meter. The portable standard meter is owned by TNEB. The meter is deemed to be working satisfactorily if the errors are within specifications for meters of 0.5% accuracy classes. The consumption registered by the meter alone holds good for the purpose of metering electricity supplied to the grid as long as the error in the meter is within the permissible limits. The meters are checked for accuracy and calibrated on a yearly basis as per the TNEB's guidelines. For the project activity annual calibration was not carried out.

2.3 Determination of the reductions in GHG emissions

The reduction in GHG emission is based on the product of net electricity supplied to grid by the project activity and the grid emission factor. Net electricity supplied to grid is the difference of electricity exported and electricity imported. Detailed procedure is described in section 3.4 accuracy of emission reduction calculation.

2.4 Review of additional data from other sources if appropriate

Not Applicable

2.5 Review of monitoring results and verification of the correct application of monitoring methodologies

The monitoring results as produced by the monitoring system have been reviewed, which includes:

- a) The raw data generation and the data aggregation trails up to the values given in the monitoring report.
- b) the control measures applied by the project participant to mitigate the reporting risk and
- c) The application of detailed data testing procedures which include, inter alia, statistical data analysis, calculation spreadsheet, data comparison, plausibility and data integrity checks, completeness checks, counter calculation of monitoring results.

The verification team has further checked whether the applicable accuracy requirements of the applied methodology or any other applicable standards are met. Any deviations thereof and related findings are reported in section 3 of this report.

Finally the verification team has reviewed the monitoring system in order to assess the ongoing compliance with

- a) the applied monitoring methodology (i.e. the approved CDM methodology ACM0002 version 10),
- b) All validated i.e. approved deviations from the approved methodology and/or the applicable methodological tools.

Two deviations from registered PD are identified and assessed, in line with section 5.3 of VCS 2007.1 and further detailed under section 3.3 of this report.

2.6 Resolution of any material discrepancy

Material discrepancies identified in the course of the verification are addressed either as CARs, CLs or FARs.

A **Corrective Action Request (CAR)** is established where:

- mistakes have been made in assumptions, application of the methodology or the project documentation which will have a direct influence the project results,
- the requirements deemed relevant for verification of the project with certain characteristics have not been met or
- there is a risk that the project would not be registered or that emission reductions would not be able to be verified and certified.

A **Clarification Request (CL)** will be issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

A **Forward Action Request (FAR)** will be issued when certain issues related to project implementation should be reviewed during the first verification.

A detailed list of the CARs CLs and FAR raised and discussed in the course of this verification is included in the next section 3 of this report.

3 VERIFICATION FINDINGS

In this section the assessments and findings from the desk review of the VCS PD, site visit, interviews and supporting documents as well as the final assessments are summarised. Table 3-1 includes an overview of all raised CARs, CLs and FARs.

Table 3-1: Overview of CARs, CLs and FARs issued

No.	Topic / Chapter	CAR	CL	FAR
3.1	Remaining issues, including any material discrepancy	01	-	-
3.2	Project implementation	-	-	-
3.3	Completeness of monitoring	05	01	-
3.4	Accuracy of emission reduction calculations	01	-	-
3.5	Quality of evidence to determine emission reductions	01	-	-
3.6	Management and operational system	-	-	-
-	SUM	08	01	-

3.1 Remaining issues, including any material discrepancy, from previous validation

Description

All the issues raised during the validation process of the project activity had been closed during the validation process. There are no remaining issues from the validation stage. FAR 01 raised during the Validation mentions to compare ex ante estimated PLF (23.86%) which the PLF observed during the monitoring period. The PLF for the current monitoring period ranges from 20.71% to 21.78% which is less the ex ante estimated values.

Related Findings

- ☐ No CARs, CLs or FARs have been identified in this context
- ☒ The following finding(s) have been addressed:

Project implementation	CAR 3.1-1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The MR does not address the issues raised under FAR 1 of the VCS validation report for the project activity. If the PLF of the project activity exceeds the range Sensitivity analysis (PLF 26.25%) the additionality of the project will be re-assessed during every monitoring period, the VERs will be issued if the project is additional.”(Refer Annex 66,67 of EB48, 10.C (i))		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The actual PLF for the monitoring period of 8 Oct 2009 to 15 Sep 2010 falls within the sensitivity range of project additionality i.e below 26.25% PLF. This clearly shows that the project activity is additional for the prescribed monitoring period. The same has been explained in the MR under section E.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The VCS PD has estimated the PLF as 23.86% with a sensitivity range of 10 % (26.25), however the PLF observed during the monitoring period is in the range from 20.71% to 21.78% which is less than the estimated value. Thus additionality need not be assessed. CAR is closed.		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Project implementation	CAR 3.1-2		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	PP is requested to clearly mention the start date and end date of all the monitoring periods since the start of the crediting period of the project activity is under VCS standard.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The start date and the end date of all the monitoring period has been incorporated in MR as per VCS standard.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The revised MR under the section A.7 mentions the details of the timeline for the project activity.		



Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements
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The assessment team has checked the remaining issues from the validation has been addressed in the MR. There are no remaining issues including any material discrepancy from the previous verification process.

3.2 Project implementation

Description

The project under consideration is set up to produce clean power from the wind electric converters. The generated electricity is wheeled using the state transmission system for captive consumption. The Project leads to reduced Greenhouse Gas (GHG) emissions because it displaces electricity from fossil fuel based electricity generation plants. The project is helping in bridging the demand supply gap by using wind as a source of generating electrical energy.

The project activity consists of the 45 machines of Enercon make of 800 KW each, aggregating to the capacity of 36 MW. The project considered harnessed renewable resources in the region, thereby displacing non-renewable natural resources thereby ultimately leading to sustainable economic and environmental development. Enercon (India) Ltd ("Enercon" or "EIL") is the equipment supplier and the operations and maintenance contractor for the project

Related Findings

- ☒ No CARs, CLs or FARs have been identified in this context
- ☐ The following finding(s) have been addressed:

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The 45 WECs belongs to project activity are distributed over Dindigull and Erode districts of Tamil Nadu state. The capacity of each machine is 0.8 MW and the total

capacity of the project activity is 36 MW. All the machines are connected with dedicated metering system. Thereafter, the machines are connected with EB substation located at Melkaraipatti and Chinnakkampalayam. The details of all the meters installed for the project activity have been described in section 3.3. During the site visit, it was found that no equipments related to WECs are neither exchanged nor replaced. Further, it is found that all the WECs are in operation since commissioning. No major breakdowns are occurred other than machine shutdowns.

However, during the site visit and subsequent document review, it was revealed that the meter for HTSC No: D29 (Premier Fine Yarns Pvt. Ltd) was replaced in 07/06/2010. Similarly for HTSC No: D78 (Coimbatore Polytex) was also replaced in 09/02/2010. During the replacement of the meter there was no generation from the Wind Turbine (Shut down) thus no discrepancies were found in the emission reduction calculation.

During the monitoring period the project activity has delivered a total of 57,681,962kWh of electricity and thus the total baseline emission comes to 53,466 tCO₂e.

It was verified during the onsite visit and subsequent document review in the course of verification that the actual project activity was implemented in accordance with the registered VCS-PD.

3.3 Completeness of monitoring

Description

The reporting^{/MR2/ /XLS1/} is in line with the requirements of the validated monitoring plan as well as with the applied methodology ACM0002 version 10^{/ACM0002/}. The reporting procedures reflect the requirements of the monitoring plan of the validated PD^{/VCS PD/}. The monitoring parameters are recorded as per the monitoring plan. The monthly JMR sheet/TNEB statement provides the net export and import and net electricity supplied to the grid (Net electricity supplied to grid = Export-Import) of each individual and grouped WECs. This data then forms the basis of emission reduction calculations.

As per the registered VCS PD, the online panel meter has to be calibrated annually. However, the panel meter does not need any calibration as it is software based integrated system which has been specially designed for control of wind turbines, where control functions, data collection and storage, real time grid monitoring and storage function are integrated. The verification team has checked the same from the technological supplier manual and thus the deviation is accepted to the verification team.

Furthermore, during the assessment, it was identified that the electricity exported and electricity imported are based on direct measurement, while as per the registered PD electricity exported and electricity imported are apportioned values mentioned in "Any

comment". Thus, deviation from the registered monitoring plan was requested by the PP. The electricity values are monitored based on the direct measurement through the dedicated meters installed at the site. Hence the apportioning is not required for the project activity and the deviation is acceptable as it leads to improvement in the overall monitoring for the project.

Each of 38 meters out of which 35 meters are make Elster, 1 Meters are of make Secure while the rest 2 meters are of make Wallaby. The meters are two way tri-vector export-import meter installed by TNEB at the high voltage side of the step up transformer installed at the project site. The installed meters measure the electricity export and electricity import for each WEC or group of WECs of the project activity which are designated by unique identification no. i.e. HTSC (High Tension Service Connection) no. which was verified on-site and was found to be correct.

The dedicated combined CTPT (Current Transformer and Potential Transformer) unit of specific rating installed at 22 KV side of the step up (400V/22KV) substation provides the required signals to the respective digital continuous meters at the designated HTSC point. All the CTPT units are of 0.5 % accuracy and connected with HTSC specific meter in one to one connection. There are 38 metering points for the project.

The meter is tested for accuracy with reference to a portable standard meter. The portable standard meter is owned by TNEB. The meter is deemed to be working satisfactorily if the errors are within specifications for meters of 0.5% accuracy classes. The consumption registered by the meter alone holds good for the purpose of metering electricity supplied to the grid as long as the error in the meter is within the permissible limits. The meters are checked for accuracy and calibrated on a yearly basis as per the TNEB's guidelines. For the project activity annual calibration was not carried out. The earlier calibration (previous MP) for all the meters were conducted on 17/06/2009, 18/06/2009 & 22/06/2009 respectively and again the calibration was conducted on 12/10/2010, 18/10/2010, 06/10/2010 & 09/10/2010 against the due date of 16/06/2010, 17/06/2010 & 21/06/2010.

However, the recent calibration has been carried 12/10/2010, 18/10/2010 and 06/10/2010 & 09/10/2010 respectively. This indicates that the calibration has been delayed by approximately 4months.

All the meters were found to be performing under the permissible limit of error. The procedures for delay in calibration has been applied as per EB 52 annex 60, and the maximum permissible error of $\pm 0.5\%$ has been applied to increase the export values and decrease the import values for the month of Jun-2010, Jul-2010, Aug-2010 & Sep-2010 thus covering the delay period. The approach in line with the guideline of EB 52 annex 60.

The monthly meter reading is taken jointly by the parties (EIL personnel and personnel of TNEB) for the previous month and form Joint Meter Reading (JMR) document which is signed by the witnessing officials of both the parties. The document forms the basis for calculation of emission reductions.

The calibration details of the meters are described below:

S. No.	Name of Customers	HTS C No.	Commissioning Date	Type	Meter No.	Last Calibration Date	Recent Calibration
1	Premier Spg & Wvg Mills Pvt Ltd	D47	21-Mar-07	Elster	04863734	18-Jun-09	12-Oct-10
2	Premier Spg & Wvg Mills Pvt Ltd	D49	21-Mar-07	Elster	04890022	18-Jun-09	12-Oct-10
3	Premier Spg & Wvg Mills Pvt Ltd	D52	26-Mar-07	Elster	04863759	18-Jun-09	12-Oct-10
4	Premier Spg & Wvg Mills Pvt Ltd	D54	26-Mar-07	Elster	04865534	18-Jun-09	12-Oct-10
5	Premier Spg & Wvg Mills Pvt Ltd	D79	25-Apr-07	Elster	04865507	17-Jun-09	12-Oct-10
6	Premier Spg & Wvg Mills Pvt Ltd	D80	25-Apr-07	Secure	TNB02400	17-Jun-09	12-Oct-10
7	Premier Spg & Wvg Mills Pvt Ltd	D81	25-Apr-07	Elster	04865535	18-Jun-09	12-Oct-10
8	Premier Spg & Wvg Mills Pvt Ltd	D82	9-May-07	Elster	04865504	17-Jun-09	12-Oct-10
9	Premier Spg & Wvg Mills Pvt Ltd	D83	9-May-07	Elster	04865503	17-Jun-09	12-Oct-10
10	Premier Spg & Wvg Mills Pvt Ltd	D84	11-May-07	Elster	04865505	17-Jun-09	12-Oct-10
11	Premier Fine Yarns Pvt Ltd	D26	26-Feb-07	Elster	04865399	17-Jun-09	12-Oct-10
12	Premier Fine Yarns Pvt Ltd	D27	26-Feb-07	Elster	04865401	17-Jun-09	12-Oct-10
13	Premier Fine Yarns Pvt Ltd	D28	26-Feb-07	Elster	04865402	17-Jun-09	12-Oct-10
14	Premier Fine Yarns Pvt Ltd	D29	26-Feb-07	Walla by & Elster *	HT5100083 & 04865403	17-Jun-09	12-Oct-10
15	Premier Fine Yarns Pvt Ltd	D30	27-Feb-07	Elster	04863758	17-Jun-09	12-Oct-10
16	Premier Fine Yarns Pvt Ltd	D30	27-Feb-07	Elster	04863758	17-Jun-09	12-Oct-10
17	Premier Fine Yarns Pvt Ltd	D32	7-Mar-07	Elster	04863757	17-Jun-09	12-Oct-10
18	Premier Fine Yarns Pvt Ltd	D32	7-Mar-07	Elster	04863757	17-Jun-09	12-Oct-10
19	Premier Fine Yarns Pvt Ltd	D33	7-Mar-07	Elster	04863762	17-Jun-09	12-Oct-10

20	Premier Fine Yarns Pvt Ltd	D34	7-Mar-07	Elster	04865400	17-Jun-09	12-Oct-10
21	Coimbatore Twisted (Premier Mills)	D37	14-Mar-07	Elster	04863761	18-Jun-09	18-Oct-10
22	Coimbatore Polytex (Premier Mills)	D38	14-Mar-07	Elster	04865383	18-Jun-09	18-Oct-10
23	Coimbatore Polytex (Premier Mills)	D43	21-Mar-07	Elster	04865533	18-Jun-09	18-Oct-10
24	Coimbatore Polytex (Premier Mills)	D43	21-Mar-07	Elster	04865533	18-Jun-09	18-Oct-10
25	Coimbatore Polytex (Premier Mills)	D44	21-Mar-07	Elster	04865526	18-Jun-09	18-Oct-10
26	Coimbatore Polytex (Premier Mills)	D45	21-Mar-07	Elster	04865528	18-Jun-09	18-Oct-10
27	Coimbatore Polytex (Premier Mills)	D68	29-Mar-07	Elster	04865501	18-Jun-09	18-Oct-10
28	Coimbatore Polytex (Premier Mills)	D73	30-Mar-07	Elster	04959599	18-Jun-09	18-Oct-10
29	Coimbatore Polytex (Premier Mills)	D74	30-Mar-07	Elster	04865530	18-Jun-09	18-Oct-10
30	Coimbatore Polytex (Premier Mills)	D75	30-Mar-07	Elster	04865531	18-Jun-09	18-Oct-10
31	Coimbatore Polytex (Premier Mills)	D78	16-Apr-07	Walla by & Elster *	208320441 & 04865500	18-Jun-09	18-Oct-10
32	Bannari Amman Spinning Mills	1067	17-Jan-06	Elster	04721986	22-Jun-09	09-Oct-10
33	Bannari Amman Spinning Mills	1068	17-Jan-06	Secure	TNB02327	22-Jun-09	06-Oct-10 & 09-Oct-10
34	Bannari Amman Spinning Mills	1069	17-Jan-06	Elster	04725673	22-Jun-09	06-Oct-10 & 09-Oct-10
35	Bannari Amman	107	17-Jan-	Elster	047256	22-Jun-09	06-Oct-10

	Spinning Mills	0	06		74		& 09-Oct-10
36	Bannari Amman Spinning Mills	1070	17-Jan-06	Elster	04725674	22-Jun-09	06-Oct-10 & 09-Oct-10
37	Bannari Amman Spinning Mills	1071	17-Jan-06	Elster	02373937	22-Jun-09	06-Oct-10 & 09-Oct-10
38	Bannari Amman Spinning Mills	1072	17-Jan-06	Elster	04721860	22-Jun-09	06-Oct-10 & 09-Oct-10
39	Bannari Amman Spinning Mills	1072	17-Jan-06	Elster	04721860	22-Jun-09	06-Oct-10 & 09-Oct-10
40	Bannari Amman Spinning Mills	1073	17-Jan-06	Elster	04721859	22-Jun-09	06-Oct-10 & 09-Oct-10
41	Bannari Amman Spinning Mills	1077	1-Feb-06	Elster	04721982	22-Jun-09	06-Oct-10 & 09-Oct-10
42	Bannari Amman Spinning Mills	1077	1-Feb-06	Elster	04721982	22-Jun-09	06-Oct-10 & 09-Oct-10
43	Bannari Amman Spinning Mills	1086	8-Feb-06	Elster	04725696	22-Jun-09	06-Oct-10 & 09-Oct-10
44	Bannari Amman Spinning Mills	1106	8-Mar-06	Elster	04726631	22-Jun-09	06-Oct-10 & 09-Oct-10
45	Bannari Amman Spinning Mills	1106	8-Mar-06	Elster	04726631	22-Jun-09	06-Oct-10 & 09-Oct-10

* D29 meter was replaced on 7-Jun-2010.

* D78 meter was replaced on 9-Feb-2010.

Related Findings



No CARs, CLs or FARs have been identified in this context



The following finding(s) have been addressed:

Monitoring Plan	3.3-1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Calibration details covering the entire monitoring period shall be described in the MR.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Calibration details has been incorporated in the MR under section C.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The revised MR mentions the calibration details of all the WECs covering the entire monitoring period under section C. The details of the meters have confirmed from the calibration reports and found correct. Further, as per the registered VCS PD the online panel meter will be calibrated annually. However, the panel meter needs no calibration as it is software based integrated system which has been specially designed for control of wind turbines, where control functions, data collection and storage, real time grid monitoring and storage function are integrated. The verification team has cross checked the same from the technological supplier manual /CAL1/and thus the deviation is accepted to the verification team. Moreover, during the site visit it was observed that the online SCADA system continuously shows the generation value on daily basis. The value is then consolidated in monthly basis which is cross checked by the assessment team and found correct Hence the CAR is closed		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements		

Monitoring Plan	3.3-2		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The Monitoring period shall be continuous, i.e. the previous verification period was till 7 th October 2009 however, the current monitoring period starts from 1 st November 2010. Appropriate corrections are required.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The correction has been made in the MR accordingly in the start date of the monitoring period		

DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The revised MR has the start date of the monitoring period from 8/10/2009 to 15/09/2010 which is continuous from the previous monitoring period which was till 7/10/2009. The same has been confirmed from the previous verification report and is acceptable.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

Monitoring Plan	3.3-3		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The breakdown/downtime details (if any) for the project WECs shall be described under the section B.1 of the MR.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	No major breakdown has been occurred in the specified monitoring period.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	There are no major breakdowns observed for the project activity WECs during the monitoring period. However shutdown for regular maintenance and operation was carried out, the details of the same is monitored with EIL and was checked. The section B.1 of the MR mentions there are no major breakdown observed and is acceptable.		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements		

Monitoring Plan	3.3-4		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The breakdown/downtime details (if any) for the project WECs shall be described under the section B.1 of the MR.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	No major breakdown has been occurred in the specified monitoring period.		

DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	There are no major breakdowns observed for the project activity WECs during the monitoring period. However shutdown for regular maintenance and operation was carried out, the details of the same is monitored with EIL and was checked. The section B.1 of the MR mentions there are no major breakdown observed and is acceptable.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

Project implementation	3.3-5		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The monitoring parameters are not as per the registered VCS PD, the parameter of Gross generation has not been monitored. Appropriate corrections are required.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The parameter Gross Generation has been included in the MR as per the registered VCS PDD.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The parameter for Gross generation from the WECs is added in the revised MR under section D.2. The gross generation values does not form a part in calculation of emission reductions, however the same is monitored as it is a parameter to be monitored as per the registered VCS PD. The gross generation values have been confirmed with the data stored in online SCADA system maintained by EIL.		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements		

Monitoring Plan	3.3-6		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	As per the registered VCS PD, it is mentioned in the column " any comment " that Apportioned values are calculated for the parameters electricity exported and electricity imported. However, during the onsite visit it was found that the electricity exported and electricity imported are monitored from the dedicated meters placed on the HT side of the transformer. Justification and clarification is sought for the same.		

Corrective Action #1	PP confirms that in Tamil Nadu, there is separate metering arrangement for calculating import & export value for each WEC. Hence no apportioning is required to calculate the electricity import, export & net export. As referred to the CDM guideline, separate metering structure is acceptable in order to get the net export value. Hence PP seek deviation in the monitoring plan from the validated VCS PD.
DOE Assessment #1	During the site visit and subsequent interview with client, it is confirmed that apportioning is not required for the calculation of electricity exported and electricity imported and the dedicated meters are installed for electricity exported and electricity imported. thus the deviation is acceptable to the verification team Hence The CAR is closed.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

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Project is connected to state electricity board which is part of Southern regional grid and has 38 metering points. JMR procedure was discussed with the Plant monitoring personnel and cross-checked with Wheeling and Banking Agreement. During the site visit and subsequent interview with PP, it was found that two meter was changed during the reported monitoring period. No abnormality was found in the metering system^{/cal/}. The delay in calibration was addressed by taking the Error correction due to delayed calibration in the emission reduction calculation sheet^{/XLS2/} which is in-line with the requirements of Annex 60 of EB 52.

3.4 Accuracy of emission reduction calculations

Description

The emission reductions ER_y due to the project activity during the year is calculated as the difference between baseline emissions (BE_y), project emissions (PE_y) and emissions due to leakage (L_y) as per the formula given below:

$$ER_y = BE_y - PE_y - L_y$$

Baseline emissions are the product of kWh of electricity produced by the renewable generating unit and emission coefficient (measured in kg CO₂e/kWh) calculated in a transparent and conservative manner as the weighted average emissions (in kg CO₂e/kWh).

$$BE_y = EG_y * EF_y$$

Since the project activity is a renewable energy project which generates electricity using wind power and hence does not result in project emissions. No leakage is considered from the project activity as per approved methodology ACM0002 version 10.

The net electricity supplied to the grid for each month has been cross checked with the JMR^{JMR/} sheets which are authentic documents. As the project supplies the net electricity to grid which is further used for captive consumption for all the WECs in the project activity. The monthly electricity bills of individual project developers mention the amount of wind power based electricity replacement. However, as the project developers also owns other wind mills except the wind mills involved in the project activity, the electricity bills of the companies mentioned the electricity consumption attributed to other wind mills also which is not part of the project activity. Hence, the value of electricity generation from those wind mills which are involved in the project activity cannot be cross checked with the monthly electricity bills. However the monthly electricity exported and imported values are sourced from the JMR sheets which are authentic and certified by TNEB, the JMR sheets were checked and the values are confirmed. Nevertheless following CAR was raised and closed successfully based on revised MR and ER calculation sheet.

Related Findings

- ☐ No CARs, CLs or FARs have been identified in this context
- ☒ The following finding(s) have been addressed:

Emission Reduction Calculations	3.4-1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The monthly export and import values in CER sheet submitted does not match between the invoices and the JMR for following months; - Premier fine yarns SC D34: Import value for the month of July 2010 - Bannari Amman Shipping yarn: - HT SC 1106: Net export values for the month of July 2010 and Export, import values for the month of September 2010. - HT SC. 1086: Export, import values for the month of September 2010.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the cor-</i>	The correction has been made accordingly in the MR & ER sheet.		



<i>rective action taken in details.</i>	
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The JMR sheet for the months have been submitted and the corrections are confirmed and found correct.
Conclusion <i>Tick the appropriate checkbox</i>	☐ ☐ ☒ ☐ ☒ To be checked during the first periodic verification Appropriate action was taken Project documentation was corrected correspondingly Additional action should be taken The project complies with the requirements

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The JMR sheet/TNEB statements are checked by the verification team for the values of export and import of electricity which was found OK.

The Emission reduction is product of net electricity supplied by the project and the grid emission factor (Southern regional grid). The net electricity supplied is cross-checked for every month while the grid emission factor remains fixed, thus the total emission reductions by the project is accurate. The Net export values for each month are cross-checked with JMR/^{JMR}/ sheets which is an authentic document.

The total net electricity supplied by WECs during the monitoring period is 57681.964 MWh. The baseline emission factor has been fixed ex-ante as 0.92694 tCO₂/MWh based on the CEA data for Southern Regional Grid^{/CEA/}. Based on the net electricity supplied and the emission factor the baseline emissions are computed to be 53,466 tCO_{2e}. All the figures as per the monitoring plan were cross-checked by the verification team against basic monitored data and the calculations were found to be correct. All the figures as per the monitoring plan were cross checked by the assessment team against basic monitored data^{/XLS1/./XLS2/} and the calculations were found to correct.

3.5 Quality of evidence to determine emission reductions

Description

Proper data management inclusive of data acquisition and aggregation, data management system is being followed for the project activity.

All records needed for monitoring are archived in line with the requirements of the registered monitoring plan /VCS-PD/. No significant, lack of evidence and missing data were detected during on-site verification. All internal data are subjected to QA/QC measures. Enercon (India) Limited (EIL) is ISO 9001:2000^{/ISO/} certified. The monitoring personal at site are well trained to carry out the task onsite.

Related Findings

- ☐ No CARs, CLs or FARs have been identified in this context
- ☒ The following finding(s) have been addressed:

Emission Reduction Calculations	3.5-1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Low PLF during the monitoring period has been considered as a reason for low emission reductions in the project activity. However the PLF is calculated only for the monitoring period, which does not give the correct picture of the PLF observed throughout the year, thus PLF observed for the year needs to be stated. PP is also requested to mention both ex-ante and actual PLF in section E.6 of the Monitoring report.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The PLF as per the registered PDD and the PLF as per actual generation has been incorporated in the MR under section E6.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The PLF considered during the validation is 23.86% while the PLF observed is in the range from 20.71% to 21.78% which is below the estimated values. As a result the emission reductions during the current monitoring period are also lesser than the estimated values.		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements		

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All internal data are subjected to QA/QC measures. Enercon (India) Limited (EIL) is ISO 9001:2000^{ISO} certified and has specified procedures for data review in form of internal audits. The roles and responsibilities are identified for the personnel involved at the site. Daily report for each WEC is generated in the online monitoring system (SCADA system) which has the data stored since the commissioning of the WEC and has been verified to confirm the gross-generation and breakdown values. The data for VCS is complied and maintained by the corporate division of Enercon, the data w.r.t to VCS requirements are stored for whole crediting period and additional 2 years. Calibration of the meters used for the project activity is being scheduled annually as mentioned in the registered PD.

The training records ^{TRA/} of the plant personals have been cross checked and found OK. Thus, they are competent to carry out the relevant tasks with sufficient curacy. All necessary monitored and measured raw data were checked during on-site verification (Ref Annex-2 of this report). The electricity exported to the grid and imported from the grid are the basic monitoring parameters. The net electricity supplied is the difference between the export and import values which is cross checked by the verification team with JMR sheets and the commercial invoices, found OK.

3.6 Management and operational system

Description

The allocation of responsibilities is documented in a written form and is followed as described in the ^{VCS-PD/}. Routines for the archiving of data are defined and documented. Calculations laid down in the monitoring report are in line with VCS-PD. The overall authority of the project site belongs to EPC contractor EIL. The Joint meter readings are noted in presence of officials from plant personnel and the TNEB officials. The data archiving of gross generation is directly measured from SCADA system. The monthly export and import values are maintained in monthly JMR sheets, which are signed by the both the parties and documented which are subjected to QA/QC measures. All monitored data are archived in physical and electronic form. The data will be kept for the whole crediting period and additional two years as given in the VCS-PD.

Related Findings

- ☒ No CARs, CLs or FARs have been identified in this context



☐ The following finding(s) have been addressed:

Final Assessment

All the management operational procedures are in place as per the registered VCS PD. Enercon is an ISO certified organization and thus all the QA/QC procedures are as per the standard. The archiving of the data is both in electronic and paper format and is in line with the VCS PD.

4 VERIFICATION STATEMENT

Enercon (India) Limited has commissioned the TÜV NORD JI / CDM Certification Program to carry out the verification of the project “Bundled Wind Power Project in Tamil Nadu managed by Enercon India limited-II” at Pushpathur site in Dindigull district and Chinnakkampalayam in Erode district of Tamil Nadu, India with regard to the requirements of VCS 2007.1 Standard.

The purpose of the project activity is to utilize wind energy which is renewable source of energy for generation of electricity. The project activity involves installation of 45 Wind Energy Convertors of 800 kW each, exporting power to Tamil Nadu Electricity Board for captive consumption. The project is connected to Southern regional grid of India^{/CEA/}. The project activity displaces the electricity of Southern regional grid of India that would have been generated mainly from fossil fuel based power generation.

A risk-based approach has been followed to perform this verification. In the course of the validation 08 Corrective Action Requests (CARs) and no Clarification request were raised which are successfully closed out. There are no FAR raised during the verification period.

As per the registered VCS PD the online panel meter will be calibrated annually. However, the panel meter does not need any calibration as it is software based integrated system which has been specially designed for control of wind turbines, where control functions, data collection and storage, real time grid monitoring and storage function are integrated. The verification team has cross checked the same from the technological supplier manual and thus the deviation is accepted to the verification team.

Furthermore, one more clarification has sought regarding monitoring of electricity generated (apportioning) was detected during verification process. During the site visit and subsequent interview with client, it is confirmed that apportioning is not required for the calculation of electricity exported and electricity imported and the dedicated meters are installed for electricity exported and electricity imported. Thus the deviation is acceptable to the verification team.

The verification is based on the draft monitoring report^{/MR1/}, revised monitoring report^{/MR2/}, the monitoring plan as set out in the validated PD^{/VCS PD/}, the validation report^{/FvalR/}, emission reduction calculation spreadsheet^{/XLS1/} and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

In detail the conclusions can be summarised as follows:

- all operations of the project are implemented and installed as planned and described in the validated project description.
- the monitoring plan is in accordance with the applied approved methodology ,ie ACM002 version 10.
- the installed equipment essential for measuring parameters required for calculating emission reductions is calibrated appropriately.
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of the 2nd periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period 8/10/2009 to 15/09/2010 as follows:

Project emissions	0	tCO ₂ equivalents
Baseline emissions	53,466	tCO ₂ equivalents
Emission reductions	53,466	tCO₂ equivalents

The Break-up of emission reduction for the present monitoring period is as follows:

Monitoring Vintage	Net Electricity supplied to the grid (kWh)	Emission Factor (tCO ₂ /MW h)	Rounded down values of Net VCUs (tCO ₂)
8/10/2009 to 31/12/2009	1,779,900	0.92694	1649
01/01/2010 to 15/09/2010	55,902,062	0.92694	51817
Total	57,681,962	-	53,466

Mumbai, 2011-01-11

Essen, 2011-01-19



TÜV NORD JI/CDM Certification
Program

Manoj kumar Borekar

Verification Team Leader

TÜV NORD JI/CDM Certification
Program

Rainer Winter

Final Approval

5 REFERENCES

Table 5-1: Documents provided by the project participant

Reference	Document
/BR/	Breakdown/Annual maintenance records for the project WECs during the monitoring period 8/10/2009 to 15/09/2010.
/CAL/	Calibration certificates of electricity meters installed at the project site. • M/s Bannari Amman Spinning Mills Ltd. Dated 09/10/2010 and 06/10/2010 • M/s. Coimbatore Twisters (P) Ltd. Dated 18/10/2010 • M/s. Premier Spg & Wvg Mills (P) Ltd Dated 12/10/2010 • M/s. Coimbatore Polytex (P) Ltd Dated 18/10/2010 • M/s. Premier Fine Yarns (P) Ltd Dated 12/10/2010
/CRI/	Commissioning certificates issued by TNEB of all the WECs located at site. • M/s. Premier Fine Yarns (P) Ltd Dated 26/02/2007, 27/02/2007, and 07/03/2007 • M/s. Coimbatore Polytex (P) Ltd Dated 21/03/2007, 29/03/2007, 30/03/2007 and 16/04/2010 • M/s. Coimbatore Twisters (P) Ltd. Dated 14/03/2007 • M/s. Premier Spg & Wvg Mills (P) Ltd Dated 21/03/2007, 26/03/2007, 25/04/2007, 09/05/2007, 11/05/2007 and 14/03/2007 • M/s Bannari Amman Spinning Mills Ltd. Dated 17/01/2006, 01/02/2006, 08/02/2006 and 08/03/2006
/GEN/	Generation at the Online meter for each WECs during the complete monitoring period (8/10/2009 to 15/09/2010) as compiled by SCDA online system at EIL.
/ISO/	Copy of ISO certificate for Enercon (India) Limited confirming the ISO Standard dated 08/02/2010 valid till 08/02/2013.
/JMR/	Copy of JMR sheets for all the WECs covering the entire monitoring period (8/10/2009 to 15/09/2010) issued by TNEB
/LA/	Layout of the project site, describing the metering positions as provided by the O&M Contractor EIL.
/MR1/	Draft MR version 1 dated 14/10/2010 which forms the basis for

Reference	Document
	verification.
/MR2/	Final MR version 2 dated 11/11/2010 which forms the basis of TUV NORD certification report.
/O&M/	Operation and Maintenance contract for individual PPs with EIL
/PPA/	Wheeling and Banking Agreement for the project activity WECs with TNEB
/RDI/	Declarations by the project proponents stating no intention of creating and trading of another form of environmental credits out of VERs would be created from this given project for the monitoring period of 8/10/2009 to 15/09/2010 (para 1.13 of VCS PD template) dated 14/10/2010
/SLD/	Single line diagram covering all the WECs and metering system as provided by EIL.
/TR/	Training certificate of the personnel working onsite dated 09.02.2009
/TS/	Technical specifications of the online meters installed along with the serial number.
/XLS1/	ER calculation spreadsheet version 1.
/XLS2/	Revised ER calculation spreadsheet.

Table 5-2: Background investigation and assessment documents

Reference	Document
/ACM0002/	Approved consolidated baseline and monitoring methodology ACM0002 version 06 - "Consolidated baseline methodology for grid connected electricity generation from renewable sources".
/VCS-PD/	Final Project Document for the project activity dated 08/09/2009
/VCS-VAL/	Final VCS Validation report for the project activity dated 10/11/2009

Reference	Document
/VCS/	Voluntary Carbon Standard 2007.1
/TA/	Tool to calculate the emissions factor for an electricity system version 01.1
/VVM/	Verification and Validation Manual (Version 1.2 as per EB 55)

Table 5-3: Websites used

Reference	Link	Organisation
/cea/	www.cea.nic.in	Central Electricity Authority
/vcs/	www.v-c-s.org	VCSA
/unfccc/	http://cdm.unfccc.int	UNFCCC

Table 5-4: List of interviewed persons

Reference	Mol ¹		Name	Organisation / Function
/IM01/	V	☒ Mr. ☐ Ms	R. Nagaraj	EIL, Dy. Manager.
/IM01/	V	☒ Mr. ☐ Ms	D. Bala Aravind Arumugam	EIL, Asst. Engineer
/IM01/	V	☐ Mr. ☒ Ms	Anushree Mishra	EIL, CDM Corporate

¹⁾ Means of Interview: (Telephone, E-Mail, Visit)