

VERIFICATION REPORT

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



Document Prepared By Bureau Veritas Certification Holding SAS

Report No.BVC/INDIA-VR/623.49/2013

Project Title	Bundled Wind Power Project in Tamil Nadu managed by Enercon India Limited - II
Version	Revision No.01
Report ID	<i>BVC/India-VCS/623.49/2013</i>

Report Title	Verification Report of Bundled Wind Power Project in Tamil Nadu managed by Enercon India Limited - II
Client	Wind World (India) Limited
Pages	30
Date of Issue	23/12/2013
Prepared By	Bureau Veritas Certification
Contact	62/71 Boulevard du Château, 92571 Neuilly Sur Seine Cdx - France
Approved By	Mr. Sanjay Patankar
Work Carried Out By	Team Leader: Mr. Anurag Juyal Team member: Mr. Srinivasan Selvaraj Internal Technical Reviewer: Mr. Sanjay Patankar.

Summary:

Bureau Veritas Certification has made the VCS verification of Bundled Wind Power Project in Tamil Nadu managed by Enercon India Limited - II, owned by Wind World (India) Limited, which is located in Pushpathur site in Dindigull district and Chinnakkampalayam in Erode district of Tamil Nadu in the state of Tamil Nadu, India with VCS Reference No. 404 on the basis of Voluntary Carbon Standard (VCS) Version 3.4, as well as criteria given to provide for consistent project operations, monitoring and reporting, UNFCCC criteria as well as the host country criteria.

The verification scope is defined as a periodic independent review and ex post determination by the Designated Operational Entity of the monitored reductions in GHG emissions during defined verification period, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up on-site visit and interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The first output of the verification process is a list of Clarification Requests, Corrective Actions Requests, Forward Actions Requests (CLs, CARs and FARs).

In summary, Bureau Veritas Certification confirms that the Project is implemented as planned and described in the VCS-PD. Deviations from the monitoring plan are sufficiently justified. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the Project is ready to reduce GHG emission. The GHG emission reduction is calculated without material misstatements.

Our opinion relates to the Project's GHG emissions and the resulting GHG emission reductions viz. Voluntary Carbon Units (VCUs) reported are based on the valid project baseline, monitoring plan and associated documents. Based on the evidence and information that are considered necessary to guarantee that GHG emission reductions are appropriately calculated, Bureau Veritas Certification confirms following statement:

Reporting period	Baseline Emissions, (BE _y) (tCO ₂ e)	Project Emissions, (PE _y) (tCO ₂ e)	Leakages, (L _y) (tCO ₂ e)	Emission Reductions, (ER _y) (tCO ₂ e)
16/09/2012 to 31/12/2012	4,120	0	0	4,120
01/01/2013 to 15/09/2013	29,070			29,070
Total	33,190	0	0	33,190

Table of Contents

1	Introduction	5
1.1	Objective	5
1.2	Scope and Criteria	6
1.3	Level of assurance	6
1.4	Summary Description of the Project	6
2	Verification Process	7
2.1	Method and Criteria	7
2.2	Document Review	7
2.3	Interviews	8
2.4	Site Inspections	8
2.5	Resolution of Any Material Discrepancy	8
3	Verification Findings	9
3.1	Project Implementation Status	9
3.2	Accuracy of GHG Emission Reduction or Removal Calculations	12
3.3	Quality of Evidence to Determine GHG Emission Reductions or Removals	17
3.4	Management and Operational System	18
4	Verification conclusion	18
5	References	20
6	C. V of verification team members	21
7	Appendix A of the verification protocol	22

Abbreviations

CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CL	Clarification Request
CO ₂	Carbon Dioxide
DOE	Designated Operational Entity
PDD	Project Design Document
UNFCCC	United Nations Framework Convention for Climate Change
DNA	Designated National Authority
M & P	Modalities and Procedure
VVS	Validation and Verification Standard
MP	Monitoring Plan
CEA	Central Electricity Authority
OM / BM	Operating Margin / Build Margin
MW	Mega Watt
MWh	Mega Watt Hour
NCES	Non Conventional Energy sources
SLM	Straight Line Method
O & M	Operation and Maintenance
JMR	Joint Meter Reading
TANGEDCO	Tamil Nadu Generation and Distribution Corporation Ltd
TNEB	Tamil Nadu Electricity Board
VCS	Voluntary Carbon Standard
WTG	Wind Turbine Generator
PP	Project Participant

1 INTRODUCTION

1.1 Objective

Wind World (India) Limited has commissioned Bureau Veritas Certification to verify the emission reductions of the Verified emission reduction (VER) of “Bundled Wind Power Project in Tamil Nadu managed by Enercon India Limited - II” (hereafter referred to as “the Project”), which is located in Pushpathur site in Dindigull district and Chinnakkampalayam site in Erode district in the state of Tamil Nadu, India for the period from 16/09/2012 to 15/09/2013, which is the fifth monitoring period.

Bureau Veritas Certification as the validation/verification body of the Project has been accredited as a DOE by UNFCCC and also meets the competence requirements as set out in ISO 14065:2007.

The Verification is the independent review and ex-post determination by the verification body of the monitored reductions in GHG emissions during defined verification period.

The Certification is the written assurance by a Certification Entity that, during a specific period in time, a project activity achieved the emission reductions as verified. According to the VVM, the Certification Entity is defined as an entity which has been accredited as a DOE by the CDM Executive Board for the particular scope into which the project falls or has been accredited as an approved Certification Entity by the VCS Steering Committee. Bureau Veritas Certification is an accredited DOE for the particular scope into which the Project falls.

The objective of verification is to verify and certify the Verified Carbon Units (VCUs) generated by the Project from 16/09/2012 to 15/09/2013.

VCS Version 3.5 Program guide and UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

Version 3**1.2 Scope and Criteria**

The verification scope is defined as an independent and objective review of the VCS Project Description (VCS-PD), the Project's baseline study and Monitoring Report (MR) and other relevant documents. The information in these documents is reviewed against VCS Standard Version 3.4 requirements.

The verification is not meant to provide any consulting towards the client. However, stated requests for forward actions and/or corrective actions may provide input for improvement of the Project monitoring towards reductions in the GHG emissions.

1.3 Level of assurance

The verification report is based on the VCS-PD, the VCS Monitoring Report (MR), supporting evidences made available to the verifier and information collected through performing interviews and during the on-site assessment. The verification team concludes that the level of assurance of the Project is high.

1.4 Summary Description of the Project

As per the registered VCS PD, the project activity is a bundled wind power project with 45 WTGs of capacity 800 kW each with an installed capacity of 36 MW. Out of this, 14 WTGs (i.e., 11.2 MW) have been registered as a part of a CDM project (UNFCCC Ref. No. 4877). Hence, for the current monitoring period, this project activity becomes a bundled wind power generation project involving 31 WTGs of capacity 800 kW each with an installed capacity of 24.8 MW, at Dindigul and Erode districts of Tamil Nadu, India. All the WTGs are of Enercon make E-48. The entire power generated by the project activity is supplied to the southern regional grid of India. The project has already been commissioned as mentioned in the VCS PD (Ref /B01/) and verified from the commissioning certificates (Ref /P05/).

All the 31 WTGs are fully functional and this was verified by the verification team during the site visit. Technical details of WTGs with respect to installation place and capacity have been verified during the site visit and found to be consistent with the details provided in the registered VCS PD.

Version 3

Project Title	Bundled Wind Power Project in Tamil Nadu managed by Enercon India Limited - II
VCS Project ID	404
Monitoring period	16/09/2012 to 15/09/2013
Project Participants	Wind World (India) Limited
Project Start date	01/04/2006
Crediting period	01/04/2006 to 31/03/2016
Methodologies used	ACM0002, Version 10.
Location of the project	Pushpathur site in Dindigull district and Chinnakkampalayam site in Erode district in the state of Tamil Nadu, India

2 VERIFICATION PROCESS

2.1 Method and Criteria

The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The Project was verified against the requirements set in VCS Standard Version 3.4 effective as on 08/10/2013 (Ref /B07/) and the Clean Development Mechanism Validation and Verification Standard Version 3.0 (Ref /B02/).

2.2 Document Review

The verification of the project documentation provided by the project participant is based upon both quantitative and qualitative information on emission reductions. Quantitative information comprises the reported numbers in the monitoring report (Ref /P01/), submitted to the Bureau Veritas Certification. Qualitative information comprises information on internal management controls, calculation procedures, procedures for transfer of data, frequency of emissions reports, and review and internal audit of calculations.

In addition to the monitoring documentation provided by the project participants, Bureau Veritas Certification reviewed:

- The VCS-PD of the Project (Ref /B01/), including the monitoring plan and the corresponding validation report (Ref /B04/)

Version 3

- b) The applied monitoring methodology (Ref /B03/)
- c) Previous verification reports (Ref /B06/)
- c) Other information and references relevant to the project activity's resulting emission reductions (e.g. CEA Emission factor Database, version 4)

2.3 Interviews

On 16/10/2013, Bureau Veritas Certification performed an on-site visit and interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review.

During the on-site visit, representatives of Wind World India Limited were interviewed. (see "References" for details).

2.4 Site Inspections

Please refer to section 3.3 above.

2.5 Resolution of Any Material Discrepancy

The objective of this phase of the verification is to raise the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification positive conclusion on the GHG emission reduction calculation.

Findings established during the verification can either be seen as a non-fulfillment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reduction is identified.

Corrective Action Requests (CARs) are issued, where:

- a) Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- b) Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;

Version 3

c) Issues identified in a FAR during validation or previous verification to be verified during verification have not been resolved by the project participants.

Forward Action Requests (FARs) are issued, for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

The verification team may also use the term Clarification Requests (CLs), if information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met.

To guarantee the transparency of the verification process, the issues raised are documented in more details below.

3 VERIFICATION FINDINGS

3.1 Project Implementation Status

It has been observed by the verification team that the project, now, involves the installation of only 31 WEGs ¹, which are located in Pushpathur site in Dindigull district and Chinnakkampalayam site in Erode district in the state of Tamil Nadu. All the WEG's are Enercon make E- 53 WEGs of capacity 800 kW each, leading to a cumulative capacity of the project as 24.8 MW. The entire power generated by the project activity is exported to the southern regional grid of India with a firm energy wheeling agreement with the Tamil Nadu Generation and Distribution Corporation Ltd. (Ref /P04/).

Sr. No.	Name of Customers	HTSC No.	Commissioning Date	No. of M/C	Capacity (MW)
1	Premier Spg & Wvg Mills Pvt Ltd	D47	21-03-2007	10	8
2	Premier Spg & Wvg Mills Pvt Ltd	D49	21-03-2007		
3	Premier Spg & Wvg Mills Pvt Ltd	D52	26-03-2007		
4	Premier Spg & Wvg Mills Pvt Ltd	D54	26-03-2007		

¹ The 14 WTGs owned by Bannari Amman Spinning mills are registered as CDM project (UN Ref. No. 4877) on 17/06/2011. Hence, this component of the project activity is not considered a part of this monitoring period. The verification team has reviewed the 3rd and 4th verification report and noted that the PP considers only 24.8 MW out of 36 MW for emission reduction calculation since 17/06/2011. Hence the same approach was accepted for the current monitoring period.

Sr. No.	Name of Customers	HTSC No.	Commissioning Date	No. of M/C	Capacity (MW)
5	Premier Spg & Wvg Mills Pvt Ltd	D79	25-04-2007		
6	Premier Spg & Wvg Mills Pvt Ltd	D80	25-04-2007		
7	Premier Spg & Wvg Mills Pvt Ltd	D81	25-04-2007		
8	Premier Spg & Wvg Mills Pvt Ltd	D82	09-04-2007		
9	Premier Spg & Wvg Mills Pvt Ltd	D83	09-05-2007		
10	Premier Spg & Wvg Mills Pvt Ltd	D84	11-05-2007		
11	Premier Fine Yarns Pvt Ltd	D26	26-02-2007	10	8
12	Premier Fine Yarns Pvt Ltd	D27	26-02-2007		
13	Premier Fine Yarns Pvt Ltd	D28	26-02-2007		
14	Premier Fine Yarns Pvt Ltd	D29	26-02-2007		
15	Premier Fine Yarns Pvt Ltd	D30	27-02-2007		
16	Premier Fine Yarns Pvt Ltd	D30	27-02-2007		
17	Premier Fine Yarns Pvt Ltd	D32	07-03-2007		
18	Premier Fine Yarns Pvt Ltd	D32	07-03-2007		
19	Premier Fine Yarns Pvt Ltd	D33	07-03-2007		
20	Premier Fine Yarns Pvt Ltd	D34	07-03-2007		
21	Coimbatore Twisted (Premier Mills)	D37	14-03-2007	1	0.8
22	Coimbatore Polytex (Premier Mills)	D38	14-03-2007	10	8
23	Coimbatore Polytex (Premier Mills)	D43	21-03-2007		
24	Coimbatore Polytex (Premier Mills)	D43	21-03-2007		
25	Coimbatore Polytex (Premier Mills)	D44	21-03-2007		
26	Coimbatore Polytex (Premier Mills)	D45	21-03-2007		
27	Coimbatore Polytex (Premier Mills)	D68	29-03-2007		
28	Coimbatore Polytex (Premier Mills)	D73	30-03-2007		
29	Coimbatore Polytex (Premier Mills)	D74	30-03-2007		
30	Coimbatore Polytex (Premier Mills)	D75	30-03-2007		
31	Coimbatore Polytex (Premier Mills)	D78	16-04-2007		
	Total			31	24.8

The electricity exported to and imported from the grid is recorded through energy meters installed at HTSC yard (Referred as main meter) bearing high tension service connection nos.

Version 3

(Referred as “HTSC”). Few WTGs are not provided with individual high tension service connections and hence in those cases electricity supplied by more than one WEG is measured through the same high tension service connection.

The WTGs have been commissioned during the period between 26/02/2007 and 09/05/2007 as mentioned in the monitoring report (Ref /P01/) and this has been cross verified with the commissioning certificates (Ref /P05/).

The start date of this monitoring period is 16/09/2012 which is found to be consistent with end date of fourth monitoring period i.e., 15/09/2012. This is checked and confirmed from the verification report of the 4th monitoring period (Ref /B05/).

The operation and implementation of the project activity have been checked during the site visit to the project activity and found to be consistent with the description provided in the registered VCS PD (Ref /B01/).

From the verification reports of 3rd and 4th monitoring period (Ref /B06/), the verification team noted that the 14 WTGs owned by Bannari Amman Spinning Mills are registered as CDM project (UNFCCC Ref. No. 4877) on 17/06/2011. From the third verification report (Ref /B06/), the verification team noted emission reduction due to this component of the project activity (14 WTGs of Bannari Amman) is only considered upto 16/06/2011. The PP has not considered the emission reduction due to this component in the 4th monitoring period. Hence for the current monitoring period as well, the emission reduction due to this component of the project activity is not considered for the emission reduction calculations.

3.2 Accuracy of GHG Emission Reduction or Removal Calculations

Monitoring has been carried out in accordance with the monitoring plan contained in the VCS-PD (Ref /B01/). The parameters, required by the monitoring plan and the way the verification team has verified the information flow (from data generation, aggregation, to recording, calculation and reporting for these parameters including the values) in the VCS-MR (Ref /P01/) are described below:

Parameters monitored ex-post:

(1) Quantity of net electricity supplied to the grid as a result of implementation of the CDM project activity in year y ($EG_{y,net}$):

This parameter is being calculated based on the measured values of export and import at TNEB's meter at respective HTSC. The value of this parameter is being sourced from statements of electricity generation (Ref /P07/).

The verification team noted that this parameter is being used for the calculation of the emission reductions for the project activity. This is found to be consistent with the monitoring methodology as per registered VCS PD (Ref /B01/).

The monthly statements for each billing month had been prepared by state utility, which mentions the net electricity supplied by the HTSC for the billing month and sent to the individual customers of the project activity. This being the certificate issued by the state utility and based on this only the individual customers (bundle members) adjusts the electricity in their HT bills; the verification team considers the document to be authentic and reliable.

(2) Electricity exported to the grid by the project activity in year y, EG_{Export}

This parameter is a measured parameter and the value of this parameter is being used for calculation of Net electricity supplied to grid by project activity. As per the registered VCS PD, this parameter is being monitored at energy meter located at TNEB's HTSC. The generated electricity is being recorded monthly. The PP reported electricity exported to the grid by the project activity on monthly basis. This is in line with ACM0002, version 10. Joint meter reading is

Version 3

being taken on a monthly basis and it is signed by TNEB's and EIL's. The value of this parameters is directly sourced from statements of electricity generation (Ref /P07/). The value of this parameter for the current monitoring period is 35945.531 MWh.

(3) Electricity imported from the grid by the project activity in year y, EG_{Import}

This parameter is a measured parameter and the value of this parameter is being used for calculation of Net electricity supplied to grid by project activity. As per the registered VCS PD, this parameter is being monitored at energy meter located at TNEB's HTSC. Electricity is being measured hourly and same is being recorded monthly. The PP reported electricity exported to the grid by the project activity on monthly basis. This is in line with ACM0002, version 10. Joint meter reading is being taken on a monthly basis and it is signed by TNEB's and EIL's. The value of this parameters is directly sourced from statements of electricity generation (Ref /P07/). The value of this parameter for the current monitoring period is 135.119 MWh.

Parameters determined ex-ante:**1) Emission factor of the grid, $EF_{Grid,CM,Y}$**

The emission factor of the crediting period of the Project has been determined, ex-ante in the registered VCS-PD (Ref /B01/). The emission factor of 0.92694 tCO₂e/MWh used for ER calculations for the current monitoring period has been verified against the registered VCS-PD and found consistent.

Calibration

During the site visit, the verification team checked the accuracy and calibration of all the meters and found them to be appropriate. The details of monitoring equipments involved in the project activity and their calibration details are mentioned in the table below:

S. No.	Name of Customers	HTSC No.	Type	Meter No.	Past Calibration date	Recent Calibration date	Accuracy Class
1	Premier Spg & Wvg Mills Pvt Ltd	D47	SECURE	TN905549	28-01-2012	13-11-2013	0.2s

S. No.	Name of Customers	HTSC No.	Type	Meter No.	Past Calibration date	Recent Calibration date	Accuracy Class
2	Premier Spg & Wvg Mills Pvt Ltd	D49	ELSTER	04890022	28-01-2012	12-11-2013	0.5s
3	Premier Spg & Wvg Mills Pvt Ltd	D52	SECURE	TN902732	09-12-2011	13-11-2013	0.2s
4	Premier Spg & Wvg Mills Pvt Ltd	D54	ELSTER	04865534	28-01-2012	13-11-2013	0.5s
5	Premier Spg & Wvg Mills Pvt Ltd	D79	ELSTER	04865507	28-01-2012	13-11-2013	0.5s
6	Premier Spg & Wvg Mills Pvt Ltd	D80	SECURE	TNB02400	28-01-2012	13-11-2013	0.5s
7	Premier Spg & Wvg Mills Pvt Ltd	D81	ELSTER	04865535	28-01-2012	13-11-2013	0.5s
8	Premier Spg & Wvg Mills Pvt Ltd	D82	SECURE	TN905507	27-01-2012	12-11-2013	0.2s
9	Premier Spg & Wvg Mills Pvt Ltd	D83	ELSTER	04865503	27-01-2012	12-11-2013	0.5s
10	Premier Spg & Wvg Mills Pvt Ltd	D84	SECURE	TN903448	27-01-2012	12-11-2013	0.2s
11	Premier Fine Yarns Pvt Ltd	D26	SECURE	TN902742	22-11-2011	12-11-2013	0.2s
12	Premier Fine Yarns Pvt Ltd	D27	SECURE	TN905284	27-01-2012	12-11-2013	0.2s
13	Premier Fine Yarns Pvt Ltd	D28	L&T	10287910	27-01-2012	12-11-2013	0.5s
14	Premier Fine Yarns Pvt Ltd	D29	WALLA BY	HT5100083	27-01-2012	12-11-2013	0.5s
15	Premier Fine Yarns Pvt Ltd	D30	WALLA BY	HT5110137	27-01-2012	12-11-2013	0.5s
16	Premier Fine Yarns Pvt Ltd	D30	WALLA BY	HT5110137	27-01-2012	12-11-2013	0.5s
17	Premier Fine Yarns Pvt Ltd	D32	SECURE	TN903995	27-01-2012	12-11-2013	0.2s
18	Premier Fine Yarns Pvt Ltd	D32	SECURE	TN903995	27-01-2012	12-11-2013	0.2s

S. No.	Name of Customers	HTSC No.	Type	Meter No.	Past Calibration date	Recent Calibration date	Accuracy Class
19	Premier Fine Yarns Pvt Ltd	D33	ELSTER	04863762	27-01-2012	12-11-2013	0.5s
20	Premier Fine Yarns Pvt Ltd	D34	SECURE	TN904584	27-01-2012	12-11-2013	0.2s
21	Coimbatore Twisted (Premier Mills)	D37	SECURE	TN904565	27-01-2012	12-11-2013	0.2s
22	Coimbatore Polytex (Premier Mills)	D38	ELSTER	04865383	27-01-2012	13-11-2013	0.5s
23	Coimbatore Polytex (Premier Mills)	D43	ELSTER	04865533	27-01-2012	12-11-2013	0.5s
24	Coimbatore Polytex (Premier Mills)	D43	ELSTER	04865533	27-01-2012	12-11-2013	0.5s
25	Coimbatore Polytex (Premier Mills)	D44	SECURE	TN903449	27-01-2012	13-11-2013	0.2s
26	Coimbatore Polytex (Premier Mills)	D45	SECURE	TN903117	27-01-2012	13-11-2013	0.2s
27	Coimbatore Polytex (Premier Mills)	D68	SECURE	TN905537	28-01-2012	13-11-2013	0.2s
28	Coimbatore Polytex (Premier Mills)	D73	ELSTER	04959599	28-01-2012	13-11-2013	0.5s
29	Coimbatore Polytex (Premier Mills)	D74	ELSTER	04865530	27-01-2012	13-11-2013	0.5s
30	Coimbatore Polytex (Premier Mills)	D75	SECURE	TN901783	18-10-2011	13-11-2013	0.2s
31	Coimbatore Polytex (Premier Mills)	D78	WALLA BY	208320441	28-01-2012	13-11-2013	0.5s

The installation and working condition of the meters were checked during the site visit for the project activity and it was found to be satisfactory. During the site visit, it was observed that meters are found to be changed for HTSC Numbers D27, D45, D47, D68, D82 and D84. In this regard, the verification team raised CL 02 to get a clarification on reasons for the meter change and if they have been considered in the emission reduction calculations. In response the PP has

Version 3

submitted complete meter change reports for the meters installed on HTSC no. D27, D45, D47, D68, D82 and D84 have been submitted by the PP.

The verification team noted from the monthly statements of each HTSC, that the electricity generated between dates of meter failure to the date of replacement of new meter is not considered while determining total electricity supplied by project. Thus verification team was able to confirm that the emission reduction calculation is not affected because of change in meter.

Further, the verification team noted from each meter change report for HTSCs - D45, D47, D68, D82 and D84 that the testing authority has mentioned that the performance of the meter and the metering set was found to be satisfactory. The failure is mainly due to display of the readings. Thus the verification team was able to confirm that the replaced (defective) meters did not operate with any errors. The verification team noted that for HTSC D27, there was an up-gradation of the accuracy class of the meter from 0.5s to 0.2s. The final and initial readings specified on the meter change report have been cross-checked by reviewing the monthly statements and confirmed to be matching. Thus, the verification team was able to conclude the emission reduction calculations have been determined correctly. Hence this CL 02 was closed.

From reviewing each of the calibration certificates, the verification team was able to confirm that test results for all the energy meters are satisfactory and that the meters have operated within the permissible error limit. However, a delay in calibration was observed for all the HTSCs. The details of the delayed calibration and application of the error for the calculation of emission reduction are provided in the table below:

For HTSC from serial no. 1 to 20 in the above table	Correction applied in months of Dec-12 to Sep-13
For HTSC in the serial no. 21	Correction applied in months of Feb-13 to Sep-13
For HTSC in the serial no. 22 to 31 in above table	Correction applied in months of Nov-12 to Sep-13

In each of the case, maximum permissible error of 0.5 % is applied to both electricity exported figure and electricity imported figure by the project activity. The verification team noted that there is no error identified in each of the delayed calibration test. Hence applying maximum

Version 3

permissible error is correct and acceptable in line with para 4 (a) of EB 52, Annex 60 i.e., Guidelines for assessing compliance with the calibration frequency requirements.

As per Para 234 c), VVS, Version 3.0 (Ref /B02/), the verification team is able to confirm that the accuracy of equipment used for monitoring is in accordance with the relevant guidance provided by the CDM executive board and it is controlled and calibrated in accordance with the monitoring plan;

- (i) Monitoring results are consistently recorded as per approved frequency;
- (ii) Quality assurance and quality control procedures have been applied in accordance with the monitoring plan.

3.3 Quality of Evidence to Determine GHG Emission Reductions or Removals

As per the monitoring plan, the following complete data set was required for the specified monitoring period to calculate the GHG emission reductions resulting from the project activity.

1) *Monthly generation statement for the electricity supplied to the grid issued by Tamil Nadu Electricity Board:*

All the statements showing the energy generated through wind mill for the current monitoring period (Ref /P07/) have been cross-checked by the verification team. The value in the statements is aggregated for all the HTSCs and used to calculate the net electricity supplied to the grid by the project activity. The PP has submitted a separate spreadsheet in the CER calculation Excel Spreadsheet (Ref /P03/), which mentions monthly statement readings for the HTSC, for the current monitoring period, separately for each billing month and for each customer. The verification team has checked the readings in each monthly statement (Ref /P07/) and confirms that the readings are correctly taken in the CER calculation sheet.

Cross check of information in monitoring report [Para 208(b), VVM 1.2]:

The measurement results of net electricity supplied to the grid has been cross-checked with the HT bills of the manufacturing plant of the customers (Ref /P06/), where the generated electricity is wheeled through the grid. The verification team noted that the readings in the monthly statements are matching with the readings adjusted in the corresponding HT bills. Thus the

Version 3

verification team was able to confirm the net electricity supplied by the project activity to the grid.

3.4 Management and Operational System

The data reporting procedure between the Project and the grid company has been identified and assessed during the on-site visit. In order to ensure the completeness of the records of the meters, the PP had taken the effective actions including the installation, adjustment, calibration and continual monitoring for the meters.

The PP has operated the project activity as per VCS-PD (Ref /B01/). The verification team noted during the site visit that the Operation and maintenance set-up has been implemented as per the description provided in the VCS PD (Ref /B01/). From interview with the O & M personnel at the site, the verification team observed that all the personnel have been trained and quality control procedures are in place. Further, the verification team noted that the reading records of all meters are based on continuous measurement and are jointly recorded by the PP and the grid company, each month. The grid company issues monthly statements to confirm the net electricity supplied to the grid.

4 VERIFICATION CONCLUSION

Bureau Veritas Certification has performed the verification of Bundled Wind Power Project in Tamil Nadu managed by Enercon India Limited – II, for which Wind World (India) Limited acts as the Project Participant. The project activity is located in Pushpathur site in Dindigull district and Chinnakkampalayam site in Erode district in the state of Tamil Nadu, India and applies the methodology ACM0002, Version 10.

The verification was performed based on the requirements set by VCS Standard Version 3.4 effective as on 08/10/2012, UNFCCC criteria for the CDM and relevant guidance provided by CMP and the CDM Executive Board.

The verification consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders and onsite visit; iii) resolution of outstanding issues and the issuance of the final verification report and opinion.

Version 3

The management of Wind World India Limited is responsible for the preparation of the GHG emissions data and the reported GHG emission reductions of the project on the basis set out within the project Monitoring Plan in the registered VCS-PD. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the Project, is the responsibility of the management of the Project.

Bureau Veritas Certification has verified the project Monitoring Report, version 2 dated 26/11/2013 for the reporting period as indicated below. Bureau Veritas Certification confirms that the Project is implemented as described in the validated and registered project design documents. Installed equipments being essential for generating emission reductions, run reliably and are calibrated appropriately. The monitoring system is in place and the Project is generating GHG emission reductions. The Project also conforms to the verification criteria for projects and their GHG emission reductions or removals set out in the VCS rules.

Bureau Veritas Certification can confirm that the GHG emission reductions are calculated without material misstatements. Our opinion relates to the projects' GHG emission and resulting GHG emission reductions reported and related to the validated and registered project baseline, monitoring plan and its associated documents. Based on the evidence and information that are considered necessary to guarantee that GHG emission reductions are appropriately calculated, Bureau Veritas Certification confirms the following statement:

Reporting period: 16/09/2012 to 15/09/2013

GHG Emission Reductions or Removals	tCO ₂ e
Baseline Emissions	33190
Project Emissions	0
Leakage	0
Net GHG emission reductions or removals	33190

5 REFERENCES

Category 1 Documents:

Documents provided by the project participant that related directly to the GHG components of the project.

/P01/	Monitoring report, version 2.0 dated 26/11/2013
/P02/	Monitoring report, version 1.0 dated 23/09/2013
/P03/	Estimated Emission Reduction calculation Excel Spreadsheet
/P04/	Energy Wheeling agreement by the investors with the Tamil Nadu Generation and Distribution Corporation Ltd
/P05/	Commissioning certificates for all the WTGs of the project activity
/P06/	HT bills of the manufacturing plants of the customers during the current monitoring period.
/P07/	Monthly statements of electricity generated, issued by TNEB, for the current monitoring period.

Category 2 Documents:

Background documents related to the design and/or methodologies employed in the design or other reference documents.

/B01/	Registered VCS-PD, version 2 dated 08/09/2009
/B02/	CDM Validation and Verification Standard (Version 3.0)
/B03/	Approved Baseline & Monitoring Methodology: ACM0002, version 10
/B04/	VCS Validation report, Report No. 53153808/02-08/480 dated 10/11/2009
/B05/	Monitoring reports of 1st, 2nd, 3rd and 4th monitoring period
/B06/	Verification reports of 1st, 2nd, 3rd and 4th monitoring period
/B07/	VCS Standard Version 3.4
/B08/	UNFCCC website and VCS website

Persons interviewed:

List persons interviewed during the validation or persons that contributed with other information that are not included in the documents listed above.

/1/	Mr. C.M Jeyakumar, Asst. Manager, Wind World (India) Limited.
/2/	Mr. Aravinthan, Asst.Engineer, Wind World (India) Limited.
/3/	Mr. Bhupendra Verma, Asst. Manager – CDM, Wind World (India) Limited.

6 CURRICULA VITAE OF THE DOE'S VERIFICATION TEAM MEMBERS

Mr. Anurag Juyal (Team Leader):

Mr. Anurag Juyal is a Post-graduate in Energy Systems with around 4 years of experience in the field of climate change services. He is working in Bureau Veritas Certification (India) Pvt. Ltd. as Verifier-Climate Change. Prior to joining Bureau Veritas, he worked on GS/CDM/VCS projects as a consultant. He has received extensive training in CDM validation and verification processes and participated in assessment of CDM projects.

Mr. S. Srinivasan (Team Member): He has Bachelors in Chemical Engineering and masters in Environmental Management and has over 7 years of experience in the field of Environment and Energy services. He is an accredited energy auditor from Bureau of Energy efficiency from Ministry of Power. He has successfully completed the IRCA approved Lead Auditor course for ISO 14001. He has been in the validation and verification of CDM/VCS/Gold standard projects since June 2008.

Mr. S Sanjay Patankar, Bureau Veritas Certification, Internal Technical Reviewer

Educational qualifications: B.E. (Mech.) M.E. (Mech.)

He has over 20 years of experience in engineering manufacturing industry covering various functions like enterprise management, product design, engineering, tool & die design, improvements in the production shop, quality assurance & control and systems planning and implementation, including ISO 9001 based quality management systems. Working for the last 2 years in Bureau Veritas Certification (India) Pvt. Ltd. as Lead Auditor for ISO 9001, 14001 and OHSAS 18001 standards/specifications. Has undergone training related to Clean Development Mechanism and is currently involved in validation and verification of CDM project activities.

APPENDIX A: VERIFICATION PROTOCOL

Table 1-Verification requirements based VCS VERSION 3 and UNFCCC rules

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
1. Project implementation in accordance with the registered project document					
a Are all physical features of the proposed VCS project activity proposed in the registered PD in place?			As per the registered VCS PD, the project activity is a bundled wind power project with 45 WTGs of capacity 800 kW each with an installed capacity of 36 MW. Out of this, 14 WTGs (i.e., 11.2 MW) have been registered as a part of a CDM project (UN Ref. No. 4877). Hence, for the current monitoring period, this project activity becomes a bundled wind power generation project involving 31 WTGs of capacity 800 kW each with an installed capacity of 24.8 MW, at Dindigul and Erode districts of Tamil Nadu, India. The WTGs are of Enercon make E-48. The entire power generated by the project activity is supplied to the southern regional grid of India. The project has already been commissioned as mentioned in the VCS PD (Ref /B01/) and verified from the commissioning certificates (Ref /P05/). All the 31 WTGs are fully functional and this was verified by the verification team during the site visit. Technical details of WTGs with respect to installation place and capacity have been verified during the site visit and found to be consistent with the details provided in the VCS PD.	OK	OK

b	Have the project participants operated the proposed VCS project activity as per the registered PD?		As per the information available in the registered PDD, the project activity was expected to operate with a PLF of 23.86 %. However, for the current monitoring period, the project activity has operated with a PLF of 16.87 %. Hence, the actual emission reductions are lesser than estimated one. Please refer 1.a above.	OK	OK
c	Was an on-site visit conducted?		Yes, the on-site visit was conducted by the verification team on 16/10/2013.	OK	OK
d	If not, justify the rationale of the decision.		Not Applicable	-	-
e	Does the implementation or operation of VCS project activity conform with the description contained in the registered PD?		As per the information available in the registered PDD, the project activity was expected to operate with a PLF of 23.86 %. However, for the current monitoring period, the project activity has operated with a PLF of 16.87 %. Hence, the actual emission reductions are lesser than estimated one. The verification team from the interview with O & M personal noted that the wind flow during this period has been low.	OK	OK
f	Was a notification or a request for approval of changes from the project activity as described in the registered PD submitted prior to the conclusion of the verification/certification for the corresponding?		Not Applicable	OK	OK
2. Compliance of the monitoring plan with the monitoring methodology					
a.	Is the validated monitoring plan in accordance with the approved methodology applied by the proposed VCS project activity?		Yes, the monitoring plan applied by the VCS project activity is in accordance with the approved methodology.	OK	OK
b.	If no, was a request for revision of the monitoring plan was done? (The DOE may request for revision of the monitoring plan covering the monitoring period under verification, for approval by the VCS Board)		Not Applicable	OK	OK

c. Are there any monitoring aspects of the project activity that are not specified in the methodology, particularly in the case of small-scale methodologies (e.g. additional monitoring parameters, monitoring frequency and calibration frequency)?			There are no parameters which are not specified in the methodology which are monitored in the project activity.	OK	OK
3. Compliance of monitoring with the monitoring plan					
a. Have the monitoring plan and the applied methodology been properly implemented and followed by the project participants?			As observed during the verification site visit, the actual monitoring practice of the project activity includes monitoring of net electricity supplied to the grid (monitored continuously, measured hourly and recorded monthly). The same is in accordance with the applied methodology ACM0002, version 10 and the registered monitoring plan. Hence, it has been confirmed that the actual monitoring followed during the current monitoring period has been carried out in accordance with the revised monitoring plan and the applied methodology.	OK	OK
b. Have the previous monitoring reports been reviewed?			Yes, the verification team has reviewed the previous monitoring reports and noted that there is no deviation observed during any of the monitoring reports.	OK	OK
c. Where applicable, has the impact of revision in the monitoring plan on the current verification been reviewed ?			Not Applicable	-	-
d. Does the registered/approved monitoring plan have any description of an illustration to calculate net electricity supplied to the grid by the project activity ?			Yes the approved monitoring plan does contain the description of an illustration to calculate net electricity supplied to the grid by the project activity.	OK	OK

e. If yes to (d) above, has the verification team verified /confirmed the validity of such illustration with supporting documents?		The verification team has reviewed the Statements showing the energy generated by the wind mill and confirms the validity of the above illustration used for calculation of net electricity supplied to the grid.	OK	OK
f. Have all parameters stated in the monitoring plan, the applied methodology and relevant VCS Board decisions been sufficiently monitored and updated as applicable, including:				
i. Project emission parameters?		The project activity involves renewable electricity generation utilizing wind energy. There are no project emission parameters which are required to be monitored as per the approved monitoring plan and the applied methodology.	OK	OK
ii. Baseline emission parameters?		The baseline emission parameter which is being monitored in the project activity is net electricity supplied to the grid which has been calculated from continuous monitoring of electricity export /import from the grid. The same has been verified during the on-site visit and is in line with the approved methodology and the revised monitoring plan.	OK	OK
iii. Leakage parameters?		There is no leakage associated with the project activity. Hence this is not applicable.	OK	OK
iv. Validation of entire procedure of apportioning, if applicable		Not applicable	OK	OK
v. Management and operational system: the responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the monitoring plan?		Yes, the responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the monitoring plan.	OK	OK
g. Is the accuracy of equipment used for monitoring in accordance with the relevant guidance provided by the VCS Board and are equipment controlled and calibrated in accordance with the monitoring plan?				

i. Are monitoring results consistently recorded as per approved frequency?		The only monitored result in the project activity is Net electricity supplied to grid by the project activity. The frequency specified for same in the monitoring plan is once in a month. This procedure is explained in section 3.4 of the registered PD. Based on site visit and document review, the verification team confirms that the monitoring results have been recorded as per approved frequency.	OK	OK
ii. Have quality assurance and quality control procedures been applied in accordance with the monitoring plan?		Yes, the quality assurance and quality control procedures been applied in accordance with the monitoring plan. Calibration records for all the meters are not submitted for verification. Please clarify.	CL-01	OK
iii. Has the verification team confirmed whether the applicability and correct implementation of any procedure that replaces direct calibration of meters, and any procedure that leads to calculation of parameters used in the ER determination ?		Not applicable since direct calibration of meters has been done.	OK	OK
4. Assessment of data and calculation of greenhouse gas emission reductions				
a. Is a complete set of data for the specified monitoring period is available? (If no, i.e., only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, the DOE shall opt to either make the most conservative assumption theoretically possible in finalizing the verification report, or raise a request for deviation prior to submitting request for issuance, if appropriate).		During the site visit, the verification team observed that the meter numbers for some of the HTSC No are not matching with the details provided in the MR. (For e.g., for HTSC No. D82, the meter No. is stated 04865504, whereas at the site, the same is observed as TN 905507). Please clarify. If the change is due to a meter change, please provide the reasons for the meter change and if that have been considered in the emission reduction calculations.	CL-02	OK

b. Has information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis?			The information provided in the monitoring report was cross checked with the Statement showing the energy generated by the project activity WEGs (or the results of joint meter reading), HT bills of the manufacturing plant of the customers and calibration reports of all energy meters. Furthermore, all calculations estimating the net electricity supplied to grid as well as emission reductions were repeated to verify the numbers in the monitoring report.	OK	OK
c. Have calculations of baseline emissions, proposed VCS 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?			The emission reduction resulting from the project activity in the monitoring period under consideration is calculated based on the Net electricity supplied to grid during the monitoring period (EG_v) and the baseline emission factor (EF_v). There are no project activity emissions and leakage involved in the project activity. All the calculations in the current monitoring period are as per the formulae and methods described in the approved monitoring plan and the applied methodology. The details of baseline emissions achieved by the project activity are provided in a tabular format for each billing month in a separate excel spreadsheet.	OK	OK
d. Have any assumptions used in emission calculations been justified?			There are no assumptions used in emission calculations.	OK	OK
e. Have appropriate emission factors, IPCC default values and other reference values been correctly applied?			Appropriate emission factor viz. 0.92694 t CO ₂ /MWh is based on CEA CO ₂ baseline database version 4 and has been correctly applied in emission reductions calculation.	OK	OK
f.				OK	OK

TABLE 2 Resolution of Corrective Action / Forward Action / Clarification Requests

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
CL 01: Calibration records for each of the monitoring meter are not submitted for verification. Please clarify.	Table 1 3. g. ii	Calibration records have been provided with revised MR.	The verification team has cross-checked the calibration certificates of all the energy meters. All the calibration certificates indicated that the energy meters were working satisfactorily without any errors. Hence it was concluded that all the energy meters were working without any errors during the entire monitoring period. Hence CL 01 was closed.
CL 02: During the site visit, the verification team observed that the meter numbers for some of the HTSC No are not matching with the details provided in the MR. (For e.g., for HTSC No. D82, the meter No. is stated 04865504, whereas at the site, the same is observed as TN 905507). Please clarify. If the change is due to a meter change, please provide the reasons for the meter change and if that have been considered in the emission reduction calculations.		All meter change reports have been provided. These details have been mentioned in revised MR along with the reasons of meter change. As the electricity generated between date of failure meter to date of replacement of new meter is not considered while calculation of total electricity supplied by project, it doesn't	Complete meter change reports for the meters installed on HTSC no. D27, D45, D47, D68, D82 and D84 have been submitted by the PP. The verification team noted from the monthly statements of each HTSC, that the electricity generated between dates of meter failure to the date of replacement of new meter is not considered while determining total electricity supplied by project. Thus verification team was able to confirm that the emission

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
		impact the emission reduction calculations.	reduction calculation is not affected because of change in meter. Further, the verification team noted from each failure report for HTSCs - D45, D47, D68, D82 and D84 that the testing authority has mentioned that the performance of the meter and the metering set was found to be satisfactory. The failure is mainly due to display of the readings. Thus the verification team was able to confirm that the replaced (defective) meters did not operate with any errors. The verification team noted that for HTSC D27, there was an up gradation of the accuracy class of the meter. The final and initial readings specified on the meter change report have been cross-checked by reviewing the monthly statements and confirmed to be matching. Thus, the verification team was able to conclude the emission reduction calculations have been determined correctly.

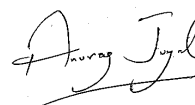
Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
			Hence this CL 02 was closed.
CL 03: The records for sold electricity is not provided to cross check the results of the net electricity generated by the project activity.		The TNEB credit notes provide the net electricity supplied along with unit charges. TNEB statements have been used in emission reduction calculations, which are approved by government authorities and can be considered final and conservative.	The PP has submitted the credit notes provided by the grid company, TNEB. The verification team noted the these documents provide the net electricity supplied during the monitoring period. The PP has correctly considered the same values for the emission reduction calculations. Hence this CL 03 was closed.
CL 04: The names of the bundle members, as mentioned in the VCS PD, version 1.0, are inconsistent with the names mentioned in the credit notes. Please clarify.		The name of M/s Premier Fine Yarns Pvt Ltd has been changed to M/s Premier Mills Pvt. Ltd. The supporting documents regarding this have been provided to DOE.	The verification team reviewed the revised MR and noted that the PP has correctly mentioned the name of the bundle member as "M/s Premier Fine Yarns Pvt Ltd". Hence this CL 04 was closed.

Sanjay Patankar
Internal Technical Reviewer



Date: 23/12/2013

Anurag Juyal
Team Leader



Date: 23/12/2013