



VERIFICATION REPORT ENERCON (INDIA) LIMITED

VERIFICATION OF THE BANNARI AMMAN SPINNING MILLS WIND POWER PROJECT MANAGED BY ENERCON (INDIA) LTD

REPORT No.BVC/INDIA-VR 01/529.49/2013

REVISION No.01

BUREAU VERITAS CERTIFICATION

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VERIFICATION REPORT

Date of first issue: 15/12/2012	Organizational unit: Bureau Veritas Certification Holding SAS
Client: Enercon (India) Limited	Client ref.: Mr. Ajay Mehra

Summary:


Bureau Veritas Certification has conducted the 1st periodic verification of Bannari Amman Spinning Mills Wind Power Project managed by Enercon (India) Ltd, CDM Registration Reference Number 4877, owned by Bannari Amman Spinning Mills Limited, which is located in Villages of Chinnaputhur, Govindapuram, Gathelrev, Molarpatti of Dharapuram Taluka, in Erode District of Tamil Nadu state in India, and applying the methodology AMS I.D Version 16, on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. 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.

The verification scope is defined as an independent and objective review and ex-post determination of the monitored GHG emission reductions, and consisted of the following three phases: i) desk review of the project design, the baseline and monitoring plan; ii) follow-up 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.

In summary, Bureau Veritas Certification confirms that the project is implemented as planned and described in the validated and registered project design documents. Installed equipments being essential for generating emission reduction run reliably and are calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions. The GHG emission reductions are calculated without material misstatements, and the emission reductions verified totalize 14,753 tons of CO₂e for the monitoring period.

Our opinion relates to the projects' GHG emissions and resulting GHG emission reductions reported and related to the valid and registered project baseline, approved monitoring plan and its associated documents.

Reporting period: 01/08/2011 to 30/06/2012
 Baseline emissions: 14,753 t CO₂ equivalents.
 Project emissions: 0 t CO₂ equivalents.
 Leakage emissions: 0 t CO₂ equivalents.
 Emission Reductions: 14,753 t CO₂ equivalents.

Report No.: BVC-India/VR 01/529.49/2013	Subject Group: CDM
Project title: Bannari Amman Spinning Mills Wind Power Project managed by Enercon (India) Ltd	
Work carried out by: Mr. Anurag Juyal - Team Leader Ms. Nazia Naqvi - Team Member	
Internal Technical Review carried out by:  Mr. Sanjay Patankar	
Date of this revision: 15/01/2013	Rev. No.: 01
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Indexing terms**Work approved by:**

Mr. Matthieu Martini

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Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CL	Clarification Request
CMP	CDM Modalities and Procedures
CO ₂	Carbon Dioxide
CO ₂ eq	Carbon Dioxide Equivalent
DOE	Designated Operational Entity
ER	Emission Reductions
FAR	Forward Action Request
GHG	Green House Gas(es)
IPCC	Intergovernmental Panel on Climate Change
ITR	Internal Technical Review
kW	Kilo watt
kWh	Kilo Watt Hour
MR	Monitoring report
O & M	Operation & Maintenance
PDD	Project Design Document
PP	Project Participant
TNEB	Tamil Nadu Electricity Board
UNFCCC	United Nations Framework Convention for Climate Change
VVS	Validation and Verification Standard
WEC	Wind Energy Convertors



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APPENDIX A: CDM PROJECT VERIFICATION PROTOCOL **ERREUR ! SIGNET NON DEFINI.**



1. INTRODUCTION

Enercon (India) Limited has commissioned Bureau Veritas Certification to verify the emissions reductions of its CDM project “*Bannari Amman Spinning Mills Wind Power Project managed by Enercon (India) Ltd*” (hereafter called “**the Project**”) at Villages of Chinnaputhur, Govindapuram, Gathelrev, Molarpatti of Dharapuram Taluka, in Erode District of Tamil Nadu state in India.

This report summarizes the findings of the verification of the Project, performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1. Objective

The objective of CDM verification is to conduct a thorough, independent assessment of the registered project activities.

In carrying out its verification work, the DOE shall ensure that the project activity complies with the requirements of paragraph 62 of the CDM modalities and procedures. In particular, this assessment shall:

- (a) Ensure that the project activity has been implemented and operated as per the registered PDD or any approved revised PDD, and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- (b) Ensure that the monitoring report and other supporting documents provided are complete in accordance with latest applicable version of the completeness checklist for requests for issuance of CERs, verifiable, and in accordance with applicable CDM requirements;
- (c) Ensure that actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan or any revised approved monitoring plan, and the approved methodology including applicable tool(s);
- (d) Evaluate the data recorded and stored as per the monitoring methodology including applicable tool(s).

1.2. Scope

The verification scope is defined as an independent and objective review and ex-post determination of the monitored GHG emission reductions. The verification is based on the validated and registered project design document, the monitoring report, emission reduction calculation spreadsheet, and supporting documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

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



1.3. GHG Project Description

The Project consists of installation of 14 WECs with a unit installed capacity of 800 kW, providing a total installed capacity of 11.20 MW. The annual expected electricity supplied to Southern regional Grid is 22,565 MWh (approx) and the annual estimated emission reductions are 21,329 tCO₂e.

Project title: Bannari Amman Spinning Mills Wind Power Project managed by Enercon (India) Ltd
 UNFCCC ref number: 4877
 Registration Date: 17/06/2011
 Crediting Period: 01/08/2011 to 31/07/2021 (fixed)
 Monitoring Period: 01/08/2011 to 30/06/2012
 Project Participants: Bannari Amman Spinning Mills Limited (Host Party Name)

Methodology used: AMS I.D Version 16
 Location of the Project: Villages of Chinnaputhur, Govindapuram, Gathelrev, Molarpatti of Dharapuram Taluka, in Erode District of Tamil Nadu state in India
 UNFCCC view page: <http://cdm.unfccc.int/Projects/DB/SIRIM1306929016.84/view>

Geo coordinates of the WTGs are as follows:

Sr. No.	UID No	Latitude	Longitude
1	BASMLDH-01	N 10°44'11.96"	E 77°25'2.73"
2	BASMLDH-02	N 10°44'19.64"	E 77°24'57.79"
3	BASMLDH-03	N 10°44'33.46"	E 77°24'54.42"
4	BASMLDH-09	N 10°44'50.65"	E 77°24'35.47"
5	BASMLDH-10	N 10°45'3.08"	E 77°24'35.14"
6	BASMLDH-11	N 10°45'13.14"	E 77°24'30.85"
7	BASMLDH-13	N 10°44'50.84"	E 77°24'19.45"
8	BASMLDH-14	N 10°44'57.94"	E 77°24'15.10"
9	BASMLDH-12	N 10°45'21.51"	E 77°24'20.58"
10	BASMLDH-04	N 10°44'42.34"	E 77°25'2.58"
11	BASMLDH-08	N 10°44'49.72"	E 77°24'58.89"
12	BASMLDH-07	N 10°45'2.42"	E 77°24'53.92"
13	BASMLDH-05	N 10°44'42.99"	E 77°25'15.38"
14	BASMLDH-06	N 10°44'50.68"	E 77°25'10.05"

The project activity involves supply, erection, commissioning and operation of 14 WECs of rated capacity 800 kW each. The machines are Enercon E-48 make. The WECs generates 3-phase power at 400 V, which is stepped up to 22 kV. Bannari Amman Spinning Mills Wind Power Project managed by Enercon (India) Ltd Amman uses the electricity for captive



consumption in its industrial unit located at Dindigul District for which Bannari Amman has signed a wheeling agreement (/1/) with the Tamil Nadu Electricity Board (TNEB).

The verification team confirms that there have been no modifications or alterations to the project activity during this monitoring period.

No post registration changes have been requested.

1.4. Verification Team

The assessment team and internal technical reviewer team consist of the following personnel:

FUNCTION	NAME	TA 1.2	TA X.X	TASK PERFORMED*
Team Leader	Mr. Anurag Juyal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> DR <input type="checkbox"/> SV <input checked="" type="checkbox"/> RI <input type="checkbox"/> TR
Team Member	Ms. Nazia Naqvi	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> DR <input checked="" type="checkbox"/> SV <input type="checkbox"/> RI <input type="checkbox"/> TR
Technical Specialist	N.A.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> DR <input checked="" type="checkbox"/> SV <input type="checkbox"/> RI <input type="checkbox"/> TR
Internal Technical Reviewer (ITR)	Mr. Sanjay Patankar	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI <input checked="" type="checkbox"/> TR
Specialist supporting ITR	N.A.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI <input type="checkbox"/> TR
Report approval	Mr. Matthieu Martini	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> DR <input type="checkbox"/> SV <input checked="" type="checkbox"/> RI <input type="checkbox"/> TR

*DR = Document Review; SV = Site Visit; RI = Report issuance; TR = Internal Technical Review

2. METHODOLOGY

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

In order to ensure transparency, a verification protocol was customized for the project, according to the version 02.0 of the Clean Development Mechanism Validation and Verification Standard, issued by CDM Executive Board at its 65th meeting on 25/11/2011. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from verifying the identified criteria. The verification protocol serves the following purposes:

- It organizes, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent verification process where the verifier will document how a particular requirement has been verified and the result of the verification.

The completed verification protocol is enclosed in Appendix A to this report.

2.1. Review of Documents

The assessment 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 (MR) version 03 dated 15/01/2013 and

emission reduction calculation spreadsheet. 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.

The monitoring report version 01 submitted by the project participant was also web hosted on the UNFCCC-CDM web site on 31/07/2012 and thus, was available in the public domain.

In addition to the monitoring documentation provided by the project participants, the DOE reviews:

- (a) The registered PDD (/2/) and the monitoring plan, including the revised monitoring plan and the corresponding validation report
- (b) The validation report (/3/)
- (c) The applied monitoring methodology
- (d) Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board
- (e) Other information and references relevant to the project activity's resulting emission reductions (e.g. IPCC reports, laboratory analysis or national regulations)

2.2. Follow-up Interviews

On 22/08/2012, Bureau Veritas Certification performed a site visit and interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of Bannari Amman Spinning Mills Limited (Project Owner) and Enercon (India) Ltd.(CDM Consultant) were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
Bannari Amman Spinning Mills Limited (the Project Owner)	<ul style="list-style-type: none"> ➤ Project Design and implementation ➤ Technical equipment, calibration and operation ➤ Monitoring Plan and management procedures ➤ Monitoring data ➤ Data uncertainty and residual risks (QA/QC) ➤ GHG Calculation ➤ Environmental Impacts ➤ Compliance with National Laws and Regulations
Enercon (India) Ltd (CDM Consultant)	<ul style="list-style-type: none"> ➤ Monitoring Plan ➤ Monitored data and Monitoring Report ➤ GHG Calculations

2.3. Resolution of Clarification, Corrective and Forward Action Requests

The objective of this phase of the verification is to resolve issues related to the monitoring, implementation and operations of the registered project activity that could impair the capacity of



the registered project activity to achieve emission reductions or influence the monitoring and reporting of emission reductions prior to Bureau Veritas Certification's 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 reductions is identified.

A Corrective Action Request (CAR) is raised, if one of the following situations occurs:

- (a) Non-compliance with the monitoring plan or methodology are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;
- (b) Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;
- (c) Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions;
- (d) Issues identified in a FAR during validation to be verified during verification or previous verification(s) have not been resolved by the project participants.

A Clarification Request (CL) is raised, if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

A Forward Action Request (FAR) is raised, for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

To guarantee the transparency of the verification process, the concerns raised are documented in more detail in the verification protocol in Appendix A.

2.4. Internal Technical Review

The verification report underwent an Internal Technical Review (ITR) before requesting issuance of CERs for the project activity.

The ITR is an independent process performed to examine thoroughly that the process of verification has been carried out in conformance with the requirements of the verification scheme as well as internal Bureau Veritas Certification procedures.

The Team Leader provides a copy of the verification report to the reviewer, including any necessary verification documentation. The reviewer reviews the submitted documentation for conformance with the verification scheme. This will be a comprehensive review of all documentation generated during the verification process.

When performing an Internal Technical Review, the reviewer ensures that:

- The verification activity has been performed by the team by exercising utmost diligence and complete adherence to the CDM rules and requirements.



- The review encompasses all aspects related to the project which includes project design, baseline, additionality, monitoring plans and emission reduction calculations, internal quality assurance systems of the project participant as well as the project activity, review of the stakeholder comments and responses, closure of CARs, CLs and FARs during the verification exercise, review of sample documents.

The reviewer may raise Clarification Requests to the verification team and discusses these matters with Team Leader.

After the agreement of the responses on the Clarification Requests from the verification team as well as the PP(s), the finalized verification report is accepted for further processing such as uploading via the UNFCCC interface.

3. VERIFICATION CONCLUSIONS

In the following sections, the conclusions of the verification are stated.

The findings from the desk review of the original monitoring documents and the findings from interviews during the follow up visit are described in the Verification Protocol in Appendix A.

The Clarification, Corrective and Forward Action Requests are stated, where applicable, in the following sections and are further documented in the Verification Protocol in Appendix A. The verification of the Project resulted in 03 CAR(s), 05 CL(s) and 01 FAR(s).

The CARs, CLs and FARs were closed based on adequate responses from the Project Participant(s) which meet the applicable requirements. They have been reassessed before their formal acceptance and closure.

The number between brackets at the end of each section corresponds to the VVS paragraph.

3.1. Remaining issues from validation or previous verification (213)

All CARs and CLs raised were successfully closed during the validation stage and previous verification of the Project, no remaining issues were left.

3.2. Compliance of the project implementation with the registered project design document (228)

From the site visit performed, the verification team is able to conclude that all the fourteen Wind Energy Convertors (WECs) each of capacity 800 kW as stated in the registered PDD have been commissioned and are in operation. The WECs are located in Chinnaputhur, Govindapuram, Gathelrev and Molarpatti villages of Dharapuram Taluka, in Erode District of Tamil Nadu, India. The total installed capacity of the project activity is 11.20 MW (14 nos. × 800 kW). The commissioning dates of the wind turbines were confirmed by checking the commissioning certificates of each WEC (/4/). All the equipments as described in the registered PDD (/2/) have been installed at the project site and the project activity does not involve any phase wise implementation. The electricity exported to and imported from the grid is recorded through energy meters (referred as main meters) bearing high tension service connection nos. (referred as HTSC). In the project activity, a total of 10 energy meters (or 10 HTSCs) are used to measure the net electricity supplied to the grid by all the 14 WECs. All the WECs are not



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provided with individual high tension service connections and hence in some cases electricity supplied by more than one WEC is measured through the same high tension service connection.

The unique identification numbers (UID No.), HTSC no's and the commissioning dates of the WECs are tabulated below:

Sr. No.	UID No	HTSC no	No of WECs	Capacity (MW)	DOC
1	BASMLDH-01	1067	1	0.8	17-Jan-06
2	BASMLDH-02	1068	1	0.8	17-Jan-06
3	BASMLDH-03	1069	1	0.8	17-Jan-06
4	BASMLDH-09	1070	2	1.6	17-Jan-06
5	BASMLDH-10				
6	BASMLDH-11	1071	1	0.8	17-Jan-06
7	BASMLDH-13	1072	2	1.6	17-Jan-06
8	BASMLDH-14				
9	BASMLDH-12	1073	1	0.8	17-Jan-06
10	BASMLDH-04	1077	2	1.6	01-Feb-06
11	BASMLDH-08				
12	BASMLDH-07	1086	1	0.8	08-Feb-06
13	BASMLDH-05	1106	2	1.6	08-Mar-06
14	BASMLDH-06				

The verification team based on the physical verification of site and documentary evidence is able to confirm and conclude that:

- There is no change in the effective output capacity due to increased installed capacity or increased number of units, or installation of units with lower capacity or units with a technology which is less advanced than that described in the PDD
- There is no addition of component or extension of technology
- There is no removal or addition of one (or more) site of a project activity registered with multiple-sites

The verification team also confirms that there has not been any change in the values of the actual operational parameters during the current monitoring period.

The electricity exported to and imported from the grid by the project activity is recorded and measured by Single billing electronic meter installed at each HTSC connection. The meter numbers and the calibration details are crosschecked by the calibration certificates issued by the TNEB (/5/). The Meter details are as follows:-

Sr. No	HTSC no	Meter Serial No.	Make	Accur acy class	Last dates of calibration before monitoring period	Calibration date during Monitoring Period	Due Date of Calibration
1	1067	04721986	ELSTER	0.5	09-Oct-10	25-Jan-12	24-Jan-15



2	1068	TN900964	SECURE	0.5	06-Oct-10	25-Jan-12	24-Jan-15
3	1069	04725673	ELSTER	0.5	06-Oct-10	25-Jan-12	24-Jan-15
4	1070	04725674	ELSTER	0.5	09-Oct-10	25-Jan-12	24-Jan-15
5	1071	02373937	ELSTER	0.5	09-Oct-10	25-Jan-12	24-Jan-15
6	1072	04721860	ELSTER	0.5	09-Oct-10	25-Jan-12	24-Jan-15
7	1073	TN902837	SECURE	0.2	09-Oct-10	25-Nov-11	24-Nov-14
8	1077	04721982	ELSTER	0.5	06-Oct-10	25-Jan-12	24-Jan-15
9	1086	04725696	ELSTER	0.5	06-Oct-10	25-Jan-12	24-Jan-15
10	1106	04726631	ELSTER	0.5	09-Oct-10	25-Jan-12	24-Jan-15

While reviewing the web hosted MR, the verification team raised the following clarification request:-

CL 1	Justification for acceptance
<p>Following inconsistencies were observed w.r.t information provided in the registered PDD and hence CL 1 was raised-</p> <p>(a) As per the registered PDD, the electricity is generated at 400 V which is stepped up to 33 KV. However during the site visit the verification team observed that the electricity generated at 400V is not stepped up to 33 KV.</p> <p>(b) As per the monitoring plan of the registered PDD the metering equipments used are electronic tri-vector meters of accuracy class 0.5%; however during the site visit the verification team observed that all the meters are not of 0.5% accuracy class.</p>	<p>In response, the PP revised the stepped up voltage and the meter accuracy details in the revised MR and hence CL 1 was closed.</p>

The verification team also reviewed the Monitoring report version 3.0 (/6/) and confirms that the information provided in the Monitoring report is in accordance with that stated in the registered PDD.

3.3. Compliance of the monitoring plan with the monitoring methodology including applicable tool(s) (232)

The verification team has verified the monitoring plan, including the data and parameters required to be monitored, measurement procedures, monitoring frequency and QC/QA procedures as described in the registered PDD.

The project activity is registered with methodology AMS I.D. version 16 (/11/) according to which the net electricity supplied to the Grid by the renewable energy technology i.e. electricity exported by the project activity to the Grid and the electricity imported from the grid is to be



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monitored and measured. Accordingly, the monitoring plan of the registered PDD indicates that the net electricity supplied to the Grid by the project activity ($EG_{BL,y}$) is calculated as the difference between Electricity exported to the grid by the project activity ($EG_{Export,y}$) and Electricity imported from the grid to the project activity ($EG_{Import,y}$).

The electricity generation is monitored through electronic tri-vector meter installed at each WEC metering location (or each HTSC). The meters installed at each metering location are with an accuracy class of 0.5 and 0.2.

The grid emission factor (0.9452 tCO₂/MWh) has been fixed ex-ante for the entire crediting period in the registered PDD.

Hence the verification team concluded that no deviation request or revision request is required for the current monitoring period.

The following clarification request was raised due to an inconsistency in monitoring frequency with respect to the applied methodology:

CL 2	Justification for acceptance
The monitoring frequency of net electricity supplied stated in the monitoring plan of the registered PDD was not in line with the applied methodology viz. AMS I.D. version 16 and hence CL 2 was raised.	In response, the PP revised the MR and clearly stated the monitoring frequency as per the applied methodology and hence CL 2 was closed.



Corresponding to the paragraph 232 of VVS version 03.0, Bureau Veritas Certification can confirm that the monitoring plan is in accordance with the approved methodology including applicable tool(s) applied by the Project.

3.4. Compliance of monitoring activities with the monitoring plan (235-236)

Monitoring has been carried out in accordance with the monitoring plan contained in the registered PDD.

[Parameters and information flow]

The parameters required by the monitoring plan and how Bureau Veritas Certification has verified the information flow (from data generation, aggregation, to recording, calculation and reporting) for these parameters including the values in the monitoring report are described below:

Parameters monitored:

Sr. no.	Parameter	Data information flow
(1)	Electricity exported to the grid by the project	The verification team noted that the electricity exported to the grid is recorded through Single billing electronic meters



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	activity in year y ($EG_{Export,y}$)	<p>owned by TNEB located at each HTSC connection.</p> <p>The electronic tri-vector meter measures the electricity export on continuous basis and is recorded by state utility on monthly basis.</p> <p>The parameter energy exported to the grid by the project activity ($EG_{Export,y}$) is measured on a continuous basis and is recorded and signed jointly by the personnel of TNEB and EIL.</p> <p>The same value is reflected in the "Statement showing the energy generated by the wind mill" issued by Tamil Nadu Generation and Distribution Corporation Limited (State Utility) on a monthly basis.</p> <p>The verification team has cross-checked and verified the monthly statements (/7/) of all the WECs for all the months during the entire crediting period.</p> <p>Since monthly statements are the certificate issued by the state utility viz. Tamil Nadu Generation and Distribution Corporation Limited hence the same is considered as authentic and reliable.</p> <p><i>Based on the above, the verification team concludes that the monitoring of electricity exported to grid by the project activity is in line with the provision described in the monitoring plan.</i></p>
(2)	Electricity imported from the grid to the project activity in year y ($EG_{Import,y}$)	<p>The verification team noted that the electricity imported from the grid to the project activity is recorded through Single billing electronic meters owned by TNEB located at each HTSC connection.</p> <p>The electronic tri-vector meter measures the electricity imported from the grid on a continuous basis and is recorded by state utility on monthly basis.</p> <p>The parameter energy imported from the grid by the project activity ($EG_{Import,y}$) is measured on a continuous basis and is recorded and signed jointly by the recorded and signed jointly by the personnel of TNEB and EIL.</p> <p>The same value is reflected in the "Statement showing the energy generated by the wind mill" issued by Tamil Nadu Generation and Distribution Corporation Limited (State Utility) on a monthly basis.</p> <p>The verification team has cross-checked and verified the monthly statements (/7/) of all the WECs for all the months during the entire crediting period.</p>



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		<p>Since monthly statements are the certificate issued by the state utility viz. Tamil Nadu Generation and Distribution Corporation Limited hence the same is considered as authentic and reliable.</p> <p><i>Based on the above, the verification team concludes that the monitoring of electricity imported from the grid by the project activity is in line with the provision described in the monitoring plan.</i></p>
(3)	Net electricity supplied to grid by the project activity $EG_{BL,y}$ ($EG_{Export,y} - EG_{Import,y}$)	<p>The verification team noted that net electricity supplied to the grid by the project activity ($EG_{BL,y}$) is a calculated value.</p> <p>It is calculated as the difference of Electricity exported to the grid by the project activity ($EG_{Export,y}$) and the Electricity imported from the Grid by the project activity ($EG_{Import,y}$).</p> <p>The electronic tri-vector meter measures the electricity export and electricity import on a continuous basis which is recorded and signed jointly by the personnel of TNEB and EIL.</p> <p>The same value is reflected in the "Statement showing the energy generated by the wind mill" issued by Tamil Nadu Generation and Distribution Corporation Limited (State Utility) on a monthly basis.</p> <p>The verification team has cross-checked and verified the monthly statements (/7/) of all the WECs for all the months during the entire crediting period.</p> <p>Since monthly statements are the certificate issued by the state utility viz. Tamil Nadu Generation and Distribution Corporation Limited hence the same is considered as authentic and reliable.</p> <p><i>Based on the above, the verification team concludes that the monitoring of net electricity supplied to the grid by the project activity is in line with the provision described in the monitoring plan.</i></p>

Parameters determined ex-ante:

- (1) EF_{CO_2} , emission factor of the southern grid

The emission factor of the Project has been determined ex-ante in the registered PDD. The emission factor used in the monitoring report has been verified against the PDD and found them to be consistent.



Corresponding to the paragraph 235 and 236 of VVS version 03.0, Bureau Veritas Certification can confirm that:



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- The monitoring has been carried out in accordance with the monitoring plan contained in the registered PDD.
- All parameters required by the monitoring plan have been sufficiently monitored and correctly listed. The monitored data for required parameters have been verified by checking the whole information flow.

3.5. Compliance with the calibration frequency requirements for measuring instruments (243)

Details of calibration frequency of measuring equipment

Baseline emission parameters		
Sr. no.	Parameter	Details
(1)	Net electricity supplied to grid by the project activity (EG_{BL,y})	<p><u>Monitoring equipment</u> – (or energy meters) installed at each HTSC connection which are used to measure the net electricity exported to the grid are of 0.2 and 0.5 accuracy class and are under the control of the state electricity utility.</p> <p><u>Calibration frequency</u> – All the energy meters have been calibrated and details of calibration of all the energy meters for the entire monitoring period has been included in section C of the monitoring report. The verification team has cross-checked the records of calibration (/5/) of all the energy meters for the entire monitoring period and found them to be appropriate.</p> <p>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.</p> <p><i>Hence the verification team confirms that the calibration frequency of measuring equipment is carried out in line with national standards¹ and EB Guidance i.e. at least once in three years.</i></p>

The following CARs and CLs were raised due to inconsistencies in monitoring documentation with respect to the registered monitoring plan:

CL 3	Justification for acceptance
The calibration frequency of monitoring equipment was not defined in the monitoring plan of the registered PDD. Hence in line EB 52/Annex 60, PP was asked to clarify if the calibration of monitoring equipments is performed either in accordance with the specifications of the local/national standards	In response, the PP revised the MR and included the calibration frequency of at least once in three years which is as per Para 17 (c) of 'General Guidelines to SSC CDM methodologies' and hence CL 3 was closed.

¹ The national standard mandates calibration of energy meters at least once in 5 years.



or as per the manufacturer specification and hence CL 3 was raised.	
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Hence, in line with the above the verification team confirms that the calibration frequency has been carried out in accordance with the national standards and EB guidance.

3.6. Assessment of data and calculation of emission reductions (246)

A complete set of data for the specified monitoring period is available.

The critical parameter used for the determination of the Emission Reductions is the net electricity supplied to the grid by the Project. The data pertaining to the above parameter are maintained in the identified records. All the data are in compliance with that stated in the Monitoring Report version 02.

As per the methodology AMS I.D Version 16 and the registered PDD, the emission reductions for the Project are calculated as the baseline emissions minus the project emissions and leakage. Hence the emission reduction is determined by the following formula:

$$ER_y = BE_y - PE_y - L_y$$

Where,

ER_y : Emission reductions

BE_y : Baseline emissions

PE_y : Project emissions

L_y : Emissions due to leakage

The data used for calculation of the GHG emission reductions are as follows:

- a) The net electricity exported to the grid by the project activity
- b) The southern regional grid emission factor.

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



Baseline emission	
Parameter	Source
Net electricity supplied to grid by the project activity ($EG_{BL,y}$)	<p><u>Statement showing the energy generated by the wind mill</u></p> <p>All the monthly Statements showing the energy generated by the project activity wind mills for the current monitoring period have been cross-checked by the verification team.</p> <p>The value in the statement is aggregated to calculate the net electricity exported to the grid by the project activity. The PP has included a separate worksheet "Generation detail" in the ER calculation spreadsheet (/8/), which mentions monthly statement readings for the project activity for the current monitoring period separately for each billing month.</p>

The verification team confirms that complete data set for all the above mentioned monitored parameters is available for the current monitoring period and hence any theoretical assumption or request for deviation was not required before submitting the request for issuance.

Cross check of information in monitoring report

The information in the monitoring report has been cross-checked through other documentary evidence as explained below:

Baseline emission	
Parameter	Cross-check Source
Net electricity supplied to grid by the project activity ($EG_{BL,y}$)	<p>The value of net electricity supplied to the grid as reflected in the monthly state energy account statement has been compared with the monthly LCS² readings (/9/). The aggregate of electricity recorded at LCS is found to be higher than the net electricity value recorded at the HTSC meters owing to transmission and transformation loss.</p> <p>The validation team agrees with the above cross-checking procedure followed since as per para 22 of methodology AMS I.D., if applicable the measurement results shall be crosschecked with records for sold/purchased electricity (e.g., invoices/receipts).</p> <p>The electricity generated by the project WECs is wheeled to the PPs industrial unit and hence there is no sale of electricity to the grid and there are no invoices/sale receipts generated and therefore the above clause is not applicable in the project context and hence cross-checking of net electricity through LCS meter readings is considered</p>

² LCS is fitted at the controller panel of each WEC and measures the electricity generation of each WEC.



	<p>to be appropriate.</p> <p>The LCS i.e. SCS Controller is a micro-processor based controller. It is especially designed for control of wind turbines. It functions on Woodward relay which has no display and needs special protocol to view energy readings and this relay communicate digital signal through special communication protocol hence, it is not possible to calibrate. In case of Malfunctioning of the SCS controller, the WTG is programmed for automatic shut-down. Hence probability of error in SCS controller's generation data is negligible.</p> <p>The value of net electricity supplied recorded at the HTSC meters are also recorded in the monthly statement and the same value is also used for calculation of baseline emissions</p>
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Calculation procedure of baseline emissions, project emissions and leakage

	Calculation procedure
Baseline emissions	<p>Baseline emission calculations have been done in the monitoring report as per the following equation -</p> $BE_y = EG_{BL,y} * EF_{CO2}$ <p>Where –</p> <p>BE_y – Baseline emissions</p> <p>$EG_{BL,y}$ – Net electricity exported to the grid by the project activity</p> <p>EF_{CO2} – Baseline emission factor for southern regional grid</p> <p>The above mentioned calculation procedure is in line with the procedure described in the registered PDD.</p> <p><u>Since start and end date of the monitoring period and the date of the billing cycle (or recording of joint meter reading) do not coincide³, so in order calculate the net electricity exported to the grid for the last month of the monitoring period i.e. from 09/06/2012 - 30/06/2012 and 07/06/2012-30/06/2012 the following approach was used -</u></p> <p>Pro-rata readings from monthly statement showing the energy generated by the wind mill for the month of June 2012 has been calculated to arrive at the value of net electricity export from 09/06/2012 - 30/06/2012 and 07/06/2012 - 30/06/2012 in the following manner-</p>

³ The billing cycle is from 7th to 7th and 9th to 9th of every month and the monitoring period is from 01/08/2011 to 30/06/2012 and hence the billing cycle and dates of monitoring period do not match.



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	<p>No. of intervening days = 22 (09/06/2012 - 30/06/2012) No. of days in June = 30 Net Electricity exported for intervening days =</p> <p>$\frac{22}{30} \times$ Net electricity supplied from monthly statement showing the energy generated by the wind mill for the month of June 2012</p> <p>No. of intervening days = 24 (07/06/2012 - 30/06/2012) No. of days in June = 30 Net Electricity exported for intervening days =</p> <p>$\frac{24}{30} \times$ Net electricity supplied from monthly statement showing the energy generated by the wind mill for the month of June 2012</p> <p>Note: The PP has not claimed electricity supplied from 01st – 7th August 2011 and 01st – 9th August 2011 i.e. at the start of monitoring period for a conservative approach and hence the above procedure was not required to be followed for the starting month of the monitoring period.</p> <p><u>The procedure adopted above was accepted by the verification team since the PP is eligible to claim emission reductions for the entire month of June 2012.</u></p>
Project emissions	Not applicable since there are no emissions attributed to the project activity outside the project boundary.
Leakage	Not applicable since there are no emissions attributed to the project activity outside the project boundary.

The verification team confirms that appropriate methods and formulae for calculating baseline emissions have been followed.

The verification team based on their observations raised the following CARs and CLs:-

CAR 1	Justification for acceptance
The PP had considered an annual PLF value of 23% for the project activity for the purpose of demonstrating additionality at the time of validation. However, PP did not compare the value of annual PLF achieved by the project activity with the estimated PLF value considered in the registered PDD in section E.6 of the MR and hence CAR 1 was raised.	In response, the PP included a comparison of actual PLF achieved by the project activity during the current monitoring period with the PDD estimates. The actual PLF achieved was observed to be lower than PDD estimates and hence CAR 1 was closed.
CAR 2	Justification for acceptance
The current monitoring period of the project starts from 01/08/2011 and ends on 30/06/2012, however the data used for calculation of baseline emissions was pertaining to period beyond the crediting period viz. July 2011 and hence CAR 2 was raised.	In response, the PP calculated the emission reductions considering data only from the current monitoring period and hence CAR 2 was closed.
CAR 3	Justification for acceptance
The electronic tri-vector meter for HTSC No. 1073 was replaced on 25/11/2011 and the	In response to CAR 3, the PP revised the emission reduction calculation and the PP



meter replacement report given by TNEB states that the energy meter was faulty between 16/10/2011-25/11/2011.	has not claimed emission reduction for the period when the meter was faulty and hence CAR 3 was closed.
PP to explain the process followed to calculate the net electricity supplied by WEC connected to HTSC no. 1073 during the period when the meter was faulty. Hence, CAR 3 was raised.	

Emission factor and default values

Baseline emission factor of southern regional grid - The emission factor taken for the calculation of baseline emissions (0.9452 tCO₂/MWh) is determined ex-ante and fixed for the crediting period. The same is in line with the registered PDD.

The verification team confirms that the emission factor is in line with the requirement of the applied methodology and associated tools.

[Comparison of ERs]

The annual estimated emission reductions are 21329 tCO₂e as per the registered PDD. The actual operation period of the Project in the monitoring period is 11 months. The corresponding estimate in the monitoring period are 19551 (=21329*11/12) tCO₂e. The actual emission reductions are 24.54 % less than the estimated value in the monitoring period. The variation is due to low wind availability leading to low plant load factor and it is deemed to be reasonable.



Corresponding to the paragraph 246 of VVS version 03.0, Bureau Veritas Certification can confirm that:

- Data used for the determination of the emission reductions are available and monitored in accordance with the monitoring plan contained in the registered PDD.
- Information and data provided in the monitoring report have been cross-checked with other sources such as plant logbooks, inventories, purchase records, laboratory analysis.
- Appropriate methods and formulae for calculating baseline emissions, project emissions and leakage have been followed.
- Assumptions, emission factors and default values that were applied in the calculations have been justified.



4. VERIFICATION OPINION

Bureau Veritas Certification has performed the 1st periodic verification of Bannari Amman Spinning Mills Wind Power Project managed by Enercon (India) Ltd, CDM Registration Reference Number 4877, which is located in Villages of Chinnaputhur, Govindapuram, Gathelrev, Molarpatti of Dharapuram Taluka, in Erode District of Tamil Nadu state in India, and applying the methodology AMS I.D Version 16. The verification was performed based on the requirements set by 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, the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion.

The management of Bannari Amman Spinning Mills 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 monitoring plan contained in the registered PDD. 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 03 dated 15/01/2013 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 as a CDM project.

Bureau Veritas Certification can confirm that the GHG emission reductions are calculated without material misstatements. Our opinion relates to the projects' GHG emissions and resulting GHG emission reductions reported and related to the validated and registered project baseline, approved 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:	01/08/2011 to 30/06/2012
Baseline emissions:	14,753 t CO ₂ equivalents
Project emissions:	0 t CO ₂ equivalents
Leakage emissions:	0 t CO ₂ equivalents
Emission Reductions:	14,753 t CO ₂ equivalents

Mr. Sanjay Patankar
Internal Technical Reviewer
17/01/2013

Mr. Anurag Juyal
Team Leader
15/01/2013



5. REFERENCES

Documents reviewed:

/1/	Wheeling agreement signed with the Tamil Nadu Electricity Board (TNEB)
/2/	Project Design Document Version 03 dated 25/04/2011; registered under CDM by UNFCCC on 17/06/2011 (Reference number 4877)
/3/	Final Validation Report dated 02/06/2011
/4/	Commissioning certificate for all the WECs
/5/	Calibration certificates of all the WECs for the years 2010 and 2012.
/6/	Final Monitoring Report version 03 dated 15/01/2013
/7/	Monthly statement showing the energy generated by the wind mill issued by Tamil Nadu Generation and Distribution Corporation Limited for the entire monitoring period.
/8/	Spreadsheet of ER calculations
/9/	LCS meter readings for energy generated by the WEC for the entire monitoring period.
/10/	Clean Development Mechanism Validation and Verification Standard, Version 2.0, EB 65 Grid connected renewable electricity generation AMS I.D version 16, sectoral scope 01
/11/	Grid connected renewable electricity generation AMS I.D version 16, sectoral scope 01

Persons interviewed:

	M/s Bannari Amman Spinning Mills Limited	
/1/	{Title and Name}	{Position}
/2/	Mr. R. Nagraj	Deputy Manager
/3/	Mr. R. V. Laganathan	Operations
/4/	Ms Amit A. Chimmalgi	Assistant Engineer
	M/s Enercon (India) Ltd	
/5/	Mr. Saujanya Kumar	CDM Consultant
/6/	Mr. Deepak Kumar Singh	Junior Technician, Enercon
/7/	Mr. Shashihanka Nayak	Junior Technician, Enercon



6. CURRICULA VITAE OF THE DOE'S VERIFICATION TEAM MEMBERS

Mr. Anurag Juyal	Bureau Veritas Certification, India	<p>Team Leader, Climate Change Lead Verifier,</p> <p>Mr. Anurag Juyal is a Post-graduate in Energy Systems with more than 5 years of experience in the field of climate change services. He is working in Bureau Veritas Certification (India) Pvt. Ltd. as Lead 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.</p>
Ms. Nazia Naqvi	Bureau Veritas Certification, India	<p>Team Member, Climate Change Verifier.</p> <p>She is a Post-graduate in M.Sc Energy Systems with over 3 years of experience in the field of clean development mechanism. She is working in Bureau Veritas Certification (India) Pvt. Ltd. as Verifier-Climate Change. Prior to joining Bureau Veritas, she worked on CDM/VCS projects as a consultant. She has received extensive training in CDM validation and verification processes and participated in assessment of CDM/VCS projects.</p>
Mr. Sanjay Patankar	Bureau Veritas Certification, India	<p>Technical Reviewer, Climate Change Lead Verifier.</p> <p>Educational qualifications: B.E. (Mech.) M.E. (Mech.)</p> <p>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</p>

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		in validation and verification of CDM project activities.
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APPEDIX A: ENERCON (INDIA) LIMITED VERIFICATION PROTOCOL (REVISION 07)

Table 1 Verification requirements based on the Clean Development Mechanism Validation and Verification Standard (Version 03.0)

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
1 Compliance of the project implementation with the registered project design document					
a Has the implementation and operation of the project activity been conducted in accordance with the description contained in the registered PDD?	VVS	226	<p>PP to clarify on the following inconsistencies observed w.r.t information provided in the registered PDD -</p> <p>(a) As per the registered PDD, the electricity is generated at 400 V which is stepped up to 33 KV. However during the site visit the verification team observed that the electricity generated at 400V is not stepped up to 33 KV.</p> <p>(b) As per the monitoring plan of the registered PDD the metering equipments used are electronic trivector meters of accuracy class 0.5%, however during the site visit the verification team observed that all the meters are not of 0.5% accuracy class.</p>	CL-1	OK
b Are all physical features of the project activity in the registered PDD in place?	VVS	227	<p>PP to clarify on the following inconsistencies observed w.r.t information provided in the registered PDD -</p> <p>(a) As per the registered PDD, the electricity is generated at 400 V which is stepped up to 33 KV. However during the site visit the verification team observed that the electricity generated at 400V is not</p>	(CL-1)	OK

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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			stepped up to 33 KV. (b) As per the monitoring plan of the registered PDD the metering equipments used are electronic trivector meters of accuracy class 0.5%, however during the site visit the verification team observed that all the meters are not of 0.5% accuracy class.		
c Have the project participants operated the project activity as per the registered PDD or any approved revised PDD?	VVS	227	The PP had considered an annual PLF value of 23% for the project activity for the purpose of demonstrating additionality at the time of validation. However, PP has not compared the value of annual PLF achieved by the project activity with the estimated PLF value considered in the registered PDD in section E.6 of the MR. Please explain.	CAR-4	OK
d Was an on-site visit conducted?	VVS	227	Yes, an on-site visit was conducted on 23/08/2012 to Dharapuram Taluka, in Erode District of Tamil Nadu state.	OK	OK
e If not, justify the rationale of the decision.	VVS	227	Not applicable	OK	OK
2 Compliance of the monitoring plan with the monitoring methodology including applicable tool(s)					
a Is the monitoring plan of the project activity in accordance with the applied methodology including applicable tool(s)?	VVS	229	The monitoring frequency of net electricity supplied stated in the monitoring plan of the registered PDD is not in line with the applied methodology viz. AMS I.D. version 16. Please clarify.	CL-2	OK
b Is the project implementation in accordance with the provisions of the registered PDD and/or an approved revised PDD?	VVS	230	PP to clarify on the following inconsistencies observed w.r.t information provided in the registered PDD -	(CL-4)	OK

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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<p>(a) As per the registered PDD, the electricity is generated at 400 V which is stepped up to 33 KV. However during the site visit the verification team observed that the electricity generated at 400V is not stepped up to 33 KV.</p> <p>(b) As per the monitoring plan of the registered PDD the metering equipments used are electronic trivector meters of accuracy class 0.5%, however during the site visit the verification team observed that all the meters are not of 0.5% accuracy class.</p>		
3 Compliance of monitoring activities with the registered monitoring plan					
a Have the monitoring of parameters related to the GHG emissions reductions in the project activity been implemented in accordance with the monitoring plan contained in the registered PDD or any accepted revised monitoring plan?	VVS	233	There are three monitoring parameters specified in the monitoring plan of the registered PDD viz. $EG_{Export,y}$, $EG_{import,y}$ and $EG_{BL,y}$ and they have been monitored in accordance with the monitoring plan contained in the registered PDD.	OK	OK
b Has the monitoring plan been properly implemented and followed by the project participants?	VVS	234	The monitoring plan has been properly implemented and followed by the project participant.	OK	OK
c Have all parameters stated in the monitoring plan and relevant Board decisions been monitored and updated as applicable, including:	VVS	234	-	-	-
i Project emission parameters?	VVS	234	There are no project emissions attributable to the project activity. Hence this condition is not applicable.	OK	OK
ii Baseline emission parameters?	VVS	234	There are three monitoring parameters specified in the monitoring plan of the registered PDD viz.	OK	OK

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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			EG _{Export,y} , EG _{import,y} and EG _{BL,y} and they have been monitored in accordance with the monitoring plan contained in the registered PDD.		
iii Leakage parameters?	VVS	234	There is no leakage emissions attributed to the project activity.	OK	OK
iv 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?	VVS	234	The project is operated and managed by competent persons. Responsibilities and authorities for the monitoring, recording and archiving of the data are allocated and followed as defined in the monitoring plan of the registered PDD.	OK	OK
d Is the equipment used for monitoring in accordance with section 4. below and is controlled and calibrated in accordance with the monitoring plan, the applied methodology, the Board guidance, local/national standards, or as per the manufacturer.s specification?	VVS	234	(1) The calibration frequency of monitoring equipment has not been defined in the monitoring plan of the registered PDD. Hence in line EB 52/Annex 60, PP to clarify if the calibration of monitoring equipments is performed either in accordance with the specifications of the local/national standards or as per the manufacturer specification.	CL-3	OK
e Are monitoring results consistently recorded as per approved frequency?	VVS	234	The actual recording frequency of electricity supplied to the grid, as observed during the on-site visit and discussion with the PP is in line with the recording frequency stated in the the registered PDD.	OK	OK
f Have quality assurance and quality control procedures been applied in accordance with the monitoring plan or the revised monitoring plan?	VVS	234	<p>The electronic trivector meter for HTSC No. 1073 was replaced on 25/11/2011 and the meter replacement report given by TNEB states that the energy meter was faulty between 16/10/2011-25/11/2011.</p> <p>PP to explain the process followed to calculate the net electricity supplied by WEC connected to HTSC no. 1073 during the period when the meter was faulty.</p>	CAR-3	OK

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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
4 Compliance with calibration frequency requirements for measuring instruments					
a Is the calibration of those measuring equipments that have an impact on the claimed emission reductions conducted by the project participants at a frequency specified in the applied monitoring methodology and/or the monitoring plan?	VVS	237	The calibration frequency of monitoring equipment has not been defined in the monitoring plan of the registered PDD. Hence in line EB 52/Annex 60, PP to clarify if the calibration of monitoring equipments is performed either in accordance with the specifications of the local/national standards or as per the manufacturer specification.	(CL-3)	OK
b During verification of a certain monitoring period, has the calibration been delayed and has the calibration has been implemented after the monitoring period in consideration (i.e. the results of delayed calibration are available)?	VVS	238	The calibration frequency of monitoring equipment has not been defined in the monitoring plan of the registered PDD. Hence in line EB 52/Annex 60, PP to clarify if the calibration of monitoring equipments is performed either in accordance with the specifications of the local/national standards or as per the manufacturer specification.	(CL-3)	OK
c If yes, is the following conservative approach adopted in the calculation of emission reductions?	VVS	238	-	-	
i Applying the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration, if the results of the delayed calibration do not show any errors in the measuring equipment, or if the error is smaller than the maximum permissible error; or	VVS	238	The calibration frequency of monitoring equipment has not been defined in the monitoring plan of the registered PDD. Hence in line EB 52/Annex 60, PP to clarify if the calibration of monitoring equipments is performed either in accordance with the specifications of the local/national standards or as per the manufacturer specification.	(CL-3)	OK
ii Applying the error identified in the delayed calibration test, if the error is beyond the maximum permissible error of the measuring	VVS	238	The calibration frequency of monitoring equipment has not been defined in the monitoring plan of the registered PDD. Hence in line EB 52/Annex 60, PP to	(CL-3)	OK

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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
equipment.			clarify if the calibration of monitoring equipments is performed either in accordance with the specifications of the local/national standards or as per the manufacturer specification.		
d Has the error has been applied:	VVS	239	-	-	
i In a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed emission reductions?	VVS	239	The calibration frequency of monitoring equipment has not been defined in the monitoring plan of the registered PDD. Hence in line EB 52/Annex 60, PP to clarify if the calibration of monitoring equipments is performed either in accordance with the specifications of the local/national standards or as per the manufacturer specification.	(CL-3)	OK
i Applying the error identified in the delayed calibration test, if the error is beyond the maximum permissible error of the measuring equipment.	VVS	239	The calibration frequency of monitoring equipment has not been defined in the monitoring plan of the registered PDD. Hence in line EB 52/Annex 60, PP to clarify if the calibration of monitoring equipments is performed either in accordance with the specifications of the local/national standards or as per the manufacturer specification.	(CL-3)	OK
e In cases where the results of the delayed calibration are not available, or the calibration has not been conducted at the time of verification, prior to finalizing verification, were the project participants requested to conduct the required calibration have the project participants calculated the emission reductions conservatively using the approach mentioned in item "c" above?	VVS	240	The calibration frequency of monitoring equipment has not been defined in the monitoring plan of the registered PDD. Hence in line EB 52/Annex 60, PP to clarify if the calibration of monitoring equipments is performed either in accordance with the specifications of the local/national standards or as per the manufacturer specification.	(CL-3)	OK
f Is it possible for the project participants to conduct the calibration at a frequency specified by either the	VVS	241	The calibration frequency of monitoring equipment has not been defined in the monitoring plan of the	(CL-3)	OK

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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
applied methodology, guidance provided by the Board, and/or the registered monitoring plan?			registered PDD. Hence in line EB 52/Annex 60, PP to clarify if the calibration of monitoring equipments is performed either in accordance with the specifications of the local/national standards or as per the manufacturer specification.		
g If no, were the requirements for post registration changes, in section of E of the VVS, followed?	VVS	241	Not applicable.	OK	OK
h Do the monitoring methodology or the monitoring plan specify any requirements for calibration frequency for measuring equipments?	VVS	242	The calibration frequency of monitoring equipment has not been defined in the monitoring plan of the registered PDD. Hence in line EB 52/Annex 60, PP to clarify if the calibration of monitoring equipments is performed either in accordance with the specifications of the local/national standards or as per the manufacturer specification.	(CL-3)	OK
i If no, are the equipments calibrated either in accordance with the specifications of the local/national standards, or as per the manufacturer's specification?.	VVS	242	The calibration frequency of monitoring equipment has not been defined in the monitoring plan of the registered PDD. Hence in line EB 52/Annex 60, PP to clarify if the calibration of monitoring equipments is performed either in accordance with the specifications of the local/national standards or as per the manufacturer specification.	(CL-3)	OK
j If neither local/national standards nor the manufacturer's specification are available, were international standards used?	VVS	242	The calibration frequency of monitoring equipment has not been defined in the monitoring plan of the registered PDD. Hence in line EB 52/Annex 60, PP to clarify if the calibration of monitoring equipments is performed either in accordance with the specifications of the local/national standards or as per the manufacturer specification.	(CL-3)	OK
5 Assessment of data and calculation of emission					

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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
reductions					
a Were the data and calculations of GHG emission reductions achieved by/resulting from the project activity by the application of the selected approved methodology assessed?	VVS	244	The current monitoring period of the project starts from 01/08/2011 and ends on 30/06/2012, however the data used for calculation of baseline emission pertains to period beyond the crediting period viz. July 2011. Please explain.	CAR-2	OK
b Is a complete set of data for the specified monitoring period is available? (If 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 either raise a CAR for the project participants to comply with the requirements of appendix 1 of the Project standard or submit a request for deviation prior to submitting request for issuance, if appropriate).	VVS	245	PP to clarify the following : (1) JMR for the month of December 2011 has not been submitted. (2) Calibration records of energy meters before the start and after the end of monitoring period has not been submitted.	CL-4	OK
c Has information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis?	VVS	245	Documentary evidence for cross-checking of electricity supplied is not provided to the DOE viz. Electricity Invoices/ Bills. Please clarify.	CL-5	OK
d Have calculations of baseline emissions, and project activity emissions and leakage, as appropriate, been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology document?	VVS	245	The calculation of baseline emissions have been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology document.	OK	OK
e Have any assumptions used in emission calculations been justified?	VVS	245	There are no assumptions involved in the emission reduction calculations.	OK	OK
f Have appropriate emission factors, IPCC default values and other reference values been correctly	VVS	245	Yes, the emission factors values used during the current monitoring period are correctly applied.	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
applied?					

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
<p><u>CAR 1</u></p> <p>The PP had considered an annual PLF value of 23% for the project activity for the purpose of demonstrating additionality at the time of validation.</p> <p>However, PP has not compared the value of annual PLF achieved by the project activity with the estimated PLF value considered in the registered PDD in section E.6 of the MR. Please explain.</p>	1c above	<p>As per DOE comment actual annual PLF of project activity has been compared with the estimated PLF value considered in the registered PDD in section E.6 of MR.</p> <p>Further for the project activity annual PLF starting from July 2011 to June 2012 (which covers the entire monitoring period) is 21.55% which is 6.31% lower than the PLF of 23% as mentioned in registered PDD. Further annual PLF of 21.55% is under the 10% sensitivity analysis done on base PLF of 23% as mentioned in registered PDD.</p>	<p>The PP has now compared the annual PLF achieved by the project activity during the current monitoring period with the estimated PLF value considered in the registered PDD.</p> <p>The actual PLF value is lower than the estimates in the registered PDD and the same is attributed to lower wind availability.</p> <p><i>Hence CAR 1 has been closed.</i></p>
<u>CAR 2</u>	5a above	Crediting period of the project activity as per	The billing cycle for different HTSC starts from 7 th and 9 th of each month.

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<p>The current monitoring period of the project starts from 01/08/2011 and ends on 30/06/2012, however the data used for calculation of baseline emission pertains to period beyond the crediting period viz. July 2011. Please explain.</p>		<p>registered PDD starts from 01 Aug 2011 to 31 Jul 2021 (Fixed) and PP has chosen the first monitoring period starting from 01 Aug 2011 to 30 Jun 2012. However while calculating the emission reduction PP has forego the generation from 01 Aug 2011 to 06 Aug 2011, since the billing period start from 7th day of every month for HTSC no. 1068, 1069, 1070, 1071, 1072, 1073, 1077, 1086 & 1106, while for HTSC no 1067 billing period starts from 9th day of every month. Carving out generation details for 06 days i.e., from 01 Aug 2011 to 06 Aug 2011 is difficult. Hence, the project proponent wishes to forego the generation for those 06 days for the purpose of simplicity</p>	<p>Since the monitoring period starts from 01 August 2011, hence PP had earlier calculated baseline emissions considering data for the month of July 2011.</p> <p>However, the baseline calculations have been revised now and data from 7th and 9th August onwards is now used for baseline emissions calculations and electricity supplied from 01 August - 09th August 2011 and 01 August - 07th August 2011 is not considered for baseline emissions calculation.</p> <p>Similarly for the end of monitoring period, the value from the monthly statement of July 2012 has been apportioned based on pro-rata basis to calculate the readings from 9th June -30th June 2012 and 7th June - 30th June 2012 respectively.</p> <p>Even though there is no apportioning</p>

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		<p>in the calculation of emission reductions during this monitoring period.</p> <p>In addition to above we would like to further submit to DOE; since the billing cycle is not in line with the monitoring period hence the generation of Jun 12 month has been apportioned based on the no of days covered for June 12 billing cycle month (07 Jun 12 / 09 Jun 12 till 30 Jun 2012) under the monitoring period. Generation pertaining to the balance days for Jul 12 billing cycle i.e. from 01 Jul 2012 till the billing cycle ends (07 Jul 12/ 09 Jul 12) will be taken under next verification so that the total generation as per JMR is covered in subsequent</p>	<p>procedure included in the registered PDD, this procedure for apportioning is considered to be appropriate since the PP is eligible to claim carbon credits for the entire month of June and July 2012.</p> <p>Hence CAR 2 has been closed.</p>

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		verification and there is no double counting or extrapolating of generation data. Same has been mentioned in MR under footnote.	
<p><u>CAR 3</u></p> <p>The electronic trivector meter for HTSC No. 1073 was replaced on 25/11/2011 and the meter replacement report given by TNEB states that the energy meter was faulty between 16/10/2011-25/11/2011.</p> <p>PP to explain the process followed to calculate the net electricity supplied by WEC connected to HTSC no. 1073 during the period when the meter was faulty.</p>	3f above	<p>We would like to submit to DOE that there was a meter failure for HTSC no. 1073 during the period 16.10.2011 to 25.11.2011 as per the meter replacement certificates. For the period of fault the bills were revised by state utility according to the field condition as per supply code and recording of meter was compared with LCS reading and accordingly revised JMR were issued by TNEB. Though being conservative PP has considered zero generation for the period of during which meter was faulty and</p>	<p>The regular billing cycle for HTSC 1073 is from 7th to 7th of each month.</p> <p>As per the documents submitted by the PP, the meter applicable to HTSC 1073 was defective from 16/10/2011-25/11/2011 and the defective meter was replaced with a new meter on 25/11/2011.</p> <p>Due to the meter defect, there were two JMR's in the month of November i.e. from 7th Nov – 25th Nov and 25th Nov- 7th Dec.</p> <p>For conservative estimate of emission reductions, the PP has only claimed ERs for the net electricity supplied during the period 25th Nov – 7th Dec.</p>

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		accordingly correction has been made in revised CER calculation sheet.	The same is considered appropriate by the verification team. Hence CAR 3 has been closed.
<u>CL 1</u> PP to clarify on the following inconsistencies observed w.r.t information provided in the registered PDD - (a) As per the registered PDD, the electricity is generated at 400 V which is stepped up to 33 KV. However during the site visit the verification team observed that the electricity generated at 400V is not stepped up to 33 KV.	1a above	(a) With reference to DOE comment, correction has been made in revised MR. Stepped up voltage has been corrected from 33 kV to 22kV.	The stepped up voltage and the meter accuracy details has been revised in the MR. The same is found to be in accordance with site visit observations.
(b) As per the monitoring plan of the registered PDD the metering equipments used are electronic trivector meters of accuracy class 0.5%, however during the site visit the verification team observed that all the meters are not of 0.5% accuracy class.		(b) Meter accuracy details has been revised under section C of revised MR.	Hence CL 1 has been closed.
<u>CL 2</u> The monitoring frequency of net electricity supplied	2a above	Net electricity supplied to grid (export – import) is measured on continuous	The monitoring frequency of net electricity supplied is clearly stated as per the applied methodology in the

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stated in the monitoring plan of the registered PDD is not in line with the applied methodology viz. AMS I.D. version 16. Please clarify.		basis and data is recorded by state utility on monthly basis as per the applied methodology version 16. Same has been mentioned in revised MR.	revised MR. Hence CL 2 has been closed.
<u>CL 3</u> The calibration frequency of monitoring equipment has not been defined in the monitoring plan of the registered PDD. Hence in line EB 52/Annex 60, PP to clarify if the calibration of monitoring equipments is performed either in accordance with the specifications of the local/national standards or as per the manufacturer specification.	3d above	We would like to clarify to DOE that calibration frequency is not mentioned under signed PPA. Further we would like to submit to DOE that as per the notification of Central Electricity Authority, dated 17 th Mar 2006 (http://powermin.nic.in/whats_new/pdf/Metering_Regulations.pdf), Para 18 (1) (b), all interface meters shall be tested at least once in five years. Further as per Para 17 (c) of 'General Guidelines to SSC	The calibration frequency is now stated in line with national standards and EB guidelines and hence a calibration frequency of at least once in three years has been stated now in the revised. MR. Hence CL 3 has been closed.

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		<p>CDM methodologies' (http://cdm.unfccc.int/methodologies/SSCmethodologies/approved/history/guid_ssc_meth/guid_ssc_v17.pdf), 'Measuring equipment should be certified to national or IEC standards and calibrated according to the national standards and reference points or IEC standards and recalibrated at appropriate intervals according to manufacturer specifications, but at least once in three years'.</p> <p>Based on the above guidelines PP has selected calibration frequency once in a three year and same has been mentioned under section C of revised MR.</p>	
<p><u>CL 4</u></p> <p>PP to clarify the following :</p>	5b above		

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(1) JMR for the month of December 2011 has not been submitted.		(1) JMR for the month of December 2011 is being submitted along with the revised MR.	(1) The JMR for the month of December 2011 has now been submitted to the DOE. <i>This query has been closed.</i>
(2) Calibration records of energy meters before the start and after the end of monitoring period has not been submitted.		(2) Calibration records of energy meter for year 2010 i.e. before the start of monitoring period is being submitted to DOE. Further we would like to submit to DOE that since calibration frequency has been selected once in a three year has the due date of calibration is in year 2015 hence calibration certificates after the monitoring period is not available.	(2) It is observed by the verification team that the energy meters were calibrated before the end of monitoring period and results of the calibration also confirmed that the meters were working within permissible limits. However, the calibration details of the energy meters after the end of the monitoring period are not available since the calibration frequency of energy meters is once in three years. The calibration frequency of once in 3 years is also in line with Para 17 (c) of 'General Guidelines to SSC CDM methodologies' <i>Hence CL 4 has been closed.</i>

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			<p>However, the verification team has raised the following forward action request for the next monitoring period.</p> <p><u>FAR 1</u></p> <p>It is observed by the verification team that the results of calibration of energy meters installed at the individual WECs are not available after the end of monitoring period on 30/06/2012. Hence the result of calibration of these energy meters, available at a future date need to be verified by the verification team involved in the subsequent verification in order to confirm the accuracy of value used for net electricity supplied during the current verification period. In case, errors are identified during the next calibration, then the excess emission reductions claimed due to the same in the current verification period should be identified and adjusted in the subsequent verification.</p>

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<p><u>CL 5</u></p> <p>Documentary evidence for cross-checking of electricity supplied is not provided to the DOE viz. Electricity Invoices/ Bills. Please clarify.</p>	5c above	<p>We would like to submit to DOE that applicable monitoring methodology AMS I.D, version 16.0, doesn't mandate the cross checking of data.</p> <p>As per the applicable methodology '<i>Measurements are undertaken using energy meters</i>'. For the project activity electricity has been monitored at cluster meters by state officials and records have been submitted to DOE.</p> <p>Further as per the point no 5 of Table 1 under para 22 of "Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories" (AMS I.D version 16.0), '<i>If applicable,</i></p>	<p>As per para 22 of methodology AMS I.D., if applicable the measurement results shall be crosschecked with records for sold/purchased electricity (e.g., invoices/receipts).</p> <p>The electricity generated by the project WECs is wheeled to the PPs industrial unit and hence there is no sale of electricity to the grid and therefore the above clause is not applicable in the project context.</p> <p>The value of net electricity supplied to the grid as reflected in the monthly state energy account statement has been compared with the monthly LCS readings. The aggregate of electricity recorded at LCS is found to be higher than the net electricity value recorded at the HTSC meters owing to transmission and transformation loss. The value of net electricity supplied recorded at the HTSC meters are also recorded in the monthly statement</p>

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		<p><i>measurement results shall be cross checked with records for sold/purchased electricity (e.g., invoices/receipts).</i></p> <p>We would like to submit to DOE that the project activity is a captive power plant and as per the wheeling and banking agreement electricity is consumed by customer at their premise at HTSC no 279 and therefore electricity sales invoices are not available for the project activity. Further at HTSC no 279 there are other wind projects of Bannari Aman (03 WTGs of Suzlon make & 09 WTGs of Enercon; out of 09 WTGs of Enercon also supplies electricity to another HTSC no. 171) which also supplies electricity to</p>	<p>and the same value is also used for calculation of baseline emissions.</p> <p>Hence CL 5 is closed.</p>

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		<p>customer premises (HTSC no 279). Since customer has signed wheeling and banking agreements therefore the values of electricity generation of 11.2 MW project cannot be traced in the monthly electricity bills of HTSC no 279. Copy of monthly electricity bills of HTSC no 279 has been provided to DOE for reference.</p> <p><i>Since the project activity doesn't sold electricity to grid or any other third party, instead electricity is used by customer for captive purpose only, that's why raising the invoices are not applicable for the project activity and accordingly cross checking of invoices is not possible nor applicable for the captive</i></p>	

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		<p><i>project.</i></p> <p>Further PP have submitted the WTGs panel generation records for DOE reference along with the transmission loss calculation between the WTG panel & 33 kV cluster metering point. Generation details as per panel meter installed inside the WTGs can be referred by DOE for comparative analysis of generation data as per TNEB statement. Further the generation data as per the cluster metering points would be conservative value and hence same has been used for CER calculation.</p>	