



VERIFICATION / CERTIFICATION REPORT

“ENERCON WIND FARMS IN KARNATAKA BUNDLED PROJECT-30.4 MW” IN INDIA

(UNFCCC Registration Ref. No. 1291)

REPORT NO. 2012-8835

REVISION NO. 01

Monitoring Period:
1 September 2011 to 30 September 2012

DNV KEMA ENERGY & SUSTAINABILITY

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Date of first issue: 18 January 2013	Project No.: PRJC-428835-2012-CCS-IND
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Client: Enercon (India) Limited (EIL)	Client ref.: Mr. Punnet Katyal

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Summary:

DNV Climate Change Services AS (DNV) has performed the verification of the emission reductions reported for the project activity “Enercon Wind farms in Karnataka Bundled Project-30.4 MW” in India” (UNFCCC Registration Ref. No. 1291) for the period 1 September 2011 to 30 September 2012.

In our opinion, the GHG emission reductions reported for the project in the monitoring report (version 3) of 03 January 2013 are fairly stated.

The GHG emission reductions were calculated correctly on the basis of the approved monitoring methodology ACM0002 (version 06) and the monitoring plan contained in the Revised Project Design Document version 6 incorporating notification of change of 16 April 2011.

DNV Climate Change Services AS is able to certify that the emission reductions from the project activity “Enercon Wind farms in Karnataka Bundled Project-30.4 MW” in India during the period 1 September 2011 to 30 September 2012 amount to 62 812 tonnes of CO₂ equivalent.

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Abbreviations

BESCOM	Bangalore Electricity Supply Company Ltd.
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction(s)
CL	Clarification request
CO ₂	Carbon dioxide
CO _{2e}	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
EIL	Enercon (India) Ltd.
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse gas(es)
HESCOM	Hubli Electricity Supply Company Ltd.
IPCC	Intergovernmental Panel on Climate Change
JMR	Joint Meter Reading
MP	Monitoring Plan
MR	Monitoring Report
PCP	Clean Development Mechanism Project Cycle Procedure
PDD	Project Design Document
PP	Project Proponent
PS	Clean Development Mechanism Project Standard
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Clean Development Mechanism Validation and Verification Standard
WEG	Wind Electricity Generators

1 INTRODUCTION

Enercon (India) Limited has commissioned DNV Climate Change Services AS (DNV) to carry out the verification and certification of emission reductions reported for the CDM project activity 1291 “Enercon Wind farms in Karnataka Bundled Project-30.4 MW” in India (the project) for the period 1 September 2011 to 30 September 2012. This report contains the findings from the verification and a certification statement for the certified emission reductions.

1.1 Objective

Verification is the periodic independent review and *ex post* determination by a Designated Operational Entity (DOE) of the monitored reductions in GHG emissions that have occurred as a result of the registered CDM project activity during a defined monitoring period.

Certification is the written assurance by a DOE that, during a specific period in time, a project activity achieved the emission reductions as verified.

The objective of this verification was to verify and certify emission reductions reported for the “Enercon Wind farms in Karnataka Bundled Project-30.4 MW” for the period 1 September 2011 to 30 September 2012.

1.2 Scope

The scope of the verification is to verify that:

- The project activity has been implemented and operated in accordance with the registered PDD and the approved revised PDD;
- The monitoring plan complies with the monitoring methodology and the actual monitoring complies with the monitoring plan, including compliance with any guidance provided by the Board regarding deviations from the provisions of a registered monitoring plan and/or methodology;
- The data and calculation of GHG emission reductions have been assessed to correctly support the emission reductions being claimed.

The verification shall ensure that reported emission reductions are complete and accurate in order to be certified.

1.3 Description of the project activity

Project Parties:	India (host), Japan
Title of project activity:	Enercon Wind farms in Karnataka Bundled Project-30.4 MW
UNFCCC registration No:	1291
UNFCCC registration date:	18 March 2010
Baseline and monitoring methodology	ACM0002 (version 06)

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Project Participants: Enercon (India) Limited and Japan Carbon Finance Ltd.

Location of the project activity: The Project is located at Gadag and Chitradurga districts in the State of Karnataka that forms part of the Southern regional electricity grid of India.

Project's crediting period: 18 March 2010 to 17 March 2020

Period verified in this verification: 1 September 2011 to 30 September 2012

1.4 Methodology for determining emission reductions

According to the applied methodology ACM0002, version 06, the emission reductions for the project are determined as the difference between the baseline emissions, project emissions and leakage:

$$ER_y = BE_y - PE_y - L_y$$

PE_y and L_y are considered as to be zero as stated in the registered PDD and validation report. Therefore, the emission reductions are accounted as:

$$ER_y = BE_y = EG_y \times EF_y$$

where,

EF_y is the emission factor of the grid to which the project is connected, and was determined and validated *ex-ante* as 0.93204 tCO₂/MWh and will not be updated during the crediting period.

EG_y is the net electricity generation delivered to the grid, which is determined by the electricity exported to the grid minus the electricity imported from the grid.

2 METHODOLOGY

DNV has assessed and determined that the implementation and operation of the project activity, and the steps taken to report emission reductions comply with the CDM criteria and relevant guidance provided by the Board.

The assessment involved a desk review of relevant documentation as well as an on-site visit(s).

The verification of the emission reductions has assessed all factors and issues that constitute the basis for emission reductions from the project. These include:

- i) Review of project documentation /1//2/;
- ii) The net electricity supplied by the project to the grid which is multiplied with a fixed grid baseline combined emission factor of 0.93204 tCO₂e/MWh /11/;
- iii) The actual installed capacity of the 30.4 MW (*renewable type*) power plant to ensure the conformance with the descriptions in the registered PDD/13//14/;

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Verification team

Role	Last Name	First Name	Country	Type of involvement					
				Desk review	Site visit	Reporting	Supervision of work	Technical review	TA 1.2 competence
Team leader (Verifier)	Prabhu	Ravi Kumar	India	✓	✓	✓	✓		✓
Verifier	Swarnim	Shilpa	India	✓	✓	✓			✓
Technical reviewer	Seshan	Ranganathan	India					✓	✓

Duration of verification

Monitoring report publication: 23 November 2012
 Desk review: 24 November 2012 to 10 December 2012
 On-site assessment: 12 December 2012 to 13 December 2012
 Reporting, calculation checks and QA/QC: 15 December 2012 to 22 January 2013

2.1 Desk review

In addition to the monitoring report (version 1 dated 19 November 2012 and version 3 dated 03 January 2013), DNV reviewed:

- Registered PDD version 5, dated 23 February 2009 /13/.
- Revised PDD version 6 incorporating notification of change of 16 April 2011/14/.
- Revised monitoring plan approved by UNFCCC on 21 July 2011, the corresponding validation report dated 3 May 2011/11/ .
- The previous verification reports/12/.
- The approved baseline and monitoring methodology ACM0002 version 6 applied by the project /19/.
- The Notification of Changes in PDD, approved by UNFCCC on 16 June 2011, relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board /17/.
- Other information and references relevant to the project activity's resulting emission reductions /2/.
- The copies of the generation certificates for all months within the verification period, which forms the basis of the emission reduction calculation /3//4//5//6/.

The monitoring report, version 01 dated 19 November 2012 /1/, has been made publicly available on the CDM website. In addition to the monitoring report (version 1 dated 19

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November 2012 and version 3 dated 03 January 2013) /1/, the verification has been performed based on the review of the following documentation provided by the project participants:

- The revised PDD, including the revised monitoring plan and the corresponding validation report/13/, /14//10/.
- The previous verification report /12/.
- The approved baseline and monitoring methodology ACM0002, version 06 applied by the project /19/.
- Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board /17//19/
- Other information and references relevant to the project activity's resulting emission reductions

During the desk review, DNV has applied standard auditing techniques to assess the quality of information provided. The following activities were performed:

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

2.2 On-site assessment

During the period of 12-13 December 2012, DNV performed on-site assessments. The key personnel of the project were interviewed and assisted the verification team /20/-/22/.

During the on-site assessment, DNV has applied standard auditing techniques to assess the quality of information provided. The following aspects of the CDM project activity have been verified:

- The implementation and operation of the CDM project activity as per the registered PDD
- The information flow for generating, aggregating and reporting of the monitoring parameters; and
- The operational and data collection procedures are implemented in accordance with the monitoring plan in the PDD.

Further, the following activities were performed:

- A cross-check between information provided in the monitoring report and data from other sources;
- A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PDD and the selected methodology;
- A review of calculations and assumptions made in determining the GHG data and emission reductions; and

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- An identification that quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

The data presented in the monitoring report was assessed by review of the detailed project documentation and production records, as well as by interviews with personnel at Enercon (India) Ltd, and observation of collection of measurements, observation of established monitoring and reporting practices and assessment of the reliability of monitoring equipment. This has enabled the verification team to assess the accuracy and completeness of reported monitoring results; to verify the correct application of the approved monitoring methodology and the determination of the emission reductions.

In addition, all parameters required by the monitoring methodology ACM0002, version 06 /19/, and the management system were assessed during the site visit.

2.3 Closing out of verification findings

The objective of this phase of the verification was to resolve any issues which needed be clarified prior to DNV's conclusion that i) the project activity has been implemented and operated in accordance with the registered PDD or any approved revised PDD, ii) the monitoring plan complies with the monitoring methodology and the actual monitoring complies with the monitoring plan and iii) the data and calculation of GHG emission reductions are correct.

A corrective action request (CAR) is issued, where:

- i. Non-conformities 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;
- ii. Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;
- iii. Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions;
- iv. Issues identified in a FAR during validation/or previous verification to be verified during verification that have not been resolved by the project participants.

A clarification request (CL) shall be 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 issued for actions if the monitoring and reporting require attention and/or adjustment for the next monitoring period.

The verification identified 1 CAR, 7 CLs and no FARs. The CARs and CLs were satisfactorily addressed by the project participants by among other revising the monitoring (please refer to Appendix A for further details). In addition to the changes made to the monitoring report as a result of the verification findings, the following changes to the monitoring report (version 3 dated 03 January 2013) were made compared to the initial version of the monitoring report received for verification (version 01 dated 19 November 2012):

- The value of total ER was revised from 62 819 tCO₂e to 62 812 tCO₂e after correcting generation details and applying correction factor for delay in calibrations, in the revised MR.
- The calibration dates has been included now for a few of the investors which were not present in webhosted MR.

3 VERIFICATION FINDINGS

This section summarises the findings from the verification of the emission reductions reported for the “Enercon Wind farms in Karnataka Bundled Project-30.4 MW” for the period 1 September 2011 to 30 September 2012 /1/.

3.1 Remaining issues, CARs, FARs from previous validation / verification

DNV confirms that there are no remaining issues from the previous verification. All CARs and CLs raised during previous verification have been adequately closed. No FAR had been identified during previous verification and during the validation.

3.2 Post registration changes

There were no post registration changes identified by DNV during this verification.

3.3 Project implementation

As part of the site visit DNV was able to confirm that the project implementation is in accordance with the project description contained in the PDD (version 5 of version 6 incorporating notification of change of 16 April 2011) /13//14/.

The verification team confirmed through visual inspection and document review that all physical features of the proposed CDM project activity including data collection systems and storage systems have been implemented in accordance with the registered PDD. DNV confirmed during the on-site visit that the CDM project is completely operational. DNV confirmed that during this verification period, neither a notification nor request for approval of changes has been requested to CDM Executive Board. However, the Notification Changes in PDD was submitted by PP during the first verification period and was approved by UNFCCC on 16 June 2011 /14/ and a request for revision of monitoring plan was approved by UNFCCC on 21 July 2011.

The project is a wind power generation (*renewable type*) power plant, with 28 WEGs located at Chitradurga and 10 WEGs at Gadag districts of Karnataka, India, each with a capacity of 800 kW. All the WEGs have been supplied by Enercon (India) Limited. The first machine of the bundle was commissioned on 29 March 2006 and the last machine commissioned on 29 December 2006.

The project was implemented and commissioned on 29 December 2006, prior to its CDM registration on 18 March 2010; hence, only the emission reductions occurring after 18 March 2010 can be claimed. The selected monitoring period 01 September 2011 to 30 September 2012 is within the fixed crediting period of 18 March 2010 to 17 March 2020.

The project's installation capacity is 30.4 MW consisting of 38 WEGs of 800 kW turbines of Enercon make. The details of the WEG's with respect to installation and capacity have been verified to be consistent with description indicated in the PDD. The actual implementation of the project during this verification period was verified in terms of name plate capacities of each turbine and generator, monitoring equipment and their accuracy levels.

The electricity generated from the project activity is supplied to the Karnataka grid, which is part of southern grid of India, under the Power Purchase Agreement (PPA). The WEGs of each investor are provided with a main electricity meter and check meter. All meters are

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bidirectional with 0.2s accuracy, all of which are used for both measuring the electricity exported to and that imported from the grid. The electricity meters are sealed by the state utility to guarantee the integrity of the instruments. This is in line with the PDD monitoring plan. Further, each of the WEG has in built control panel meter to monitor generation from the central monitoring stations

3.4 Information (data and variables) provided in the monitoring report that is different from that stated in the registered PDD

The electricity generation reported in this monitoring period is 67 393.032 MWh in the period from 1 September 2011 to 30 September 2012 (inclusive of both days i.e. 396 days). The expected annual generation in the registered PDD is 70 570.56 MWh, which corresponds to 76 564.224 MWh in 396 days. Hence, actual generation is considerably lower than expected due to the low PLF achieved by the project activity during the monitoring period.

As a result of lower electricity generation, actual emission reductions are lower than the emission reductions estimated in the PDD /13//14/.

3.5 Compliance of monitoring plan with monitoring methodology

DNV is able to confirm that the revised monitoring plan approved on 21 July 2011 /16/, is in accordance with the approved methodology applied by the project activity, i.e. ACM0002 (version 06) /19/.

3.6 Compliance of monitoring with the monitoring plan

The monitoring has been carried out in accordance with the monitoring plan contained in the revised monitoring plan approved on 21 July 2011 /16/. All parameters stated in the validated monitoring plan are monitored and reported appropriately. The monitoring report lists each parameter required by the monitoring plan and the information flow (i.e. from data generation, aggregation, to recording, calculation and reporting) for these parameters is provided in the monitoring report. The information flow for the each parameter is further verified in the following sections. DNV confirms that neither a revision nor a deviation to the monitoring plan has been requested to CDM Executive Board during this verification period. However, the Notification Changes in PDD was submitted by PP during the first verification period and was approved by UNFCCC on 16 June 2011 and a request for revision of monitoring plan was approved by UNFCCC on 21 July 2011 /16/.

3.6.1 Monitoring parameters

According to the revised monitoring plan approved by UNFCCC on 21 July 2011, there are 4 parameters to be monitored:

- a) Net electricity supplied to the grid by the project activity, EG_y ,
- b) Electricity export recorded at meters (EG_{export}) of the individual investors.
- c) Electricity import recorded at meters (EG_{import}) of the individual investors
- d) Transmission loss for export between the metering location at 33 kV metering point and the high voltage side of the substation to which the subproject is connected, (T_E).

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The below tables describe for each parameter, which is to be measured according to the monitoring plan, how DNV has verified that i) the actual monitoring complies with the monitoring plan and that ii) data have been assessed to correctly support the emission reductions being claimed.

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	Net electricity supplied to the grid EG_y
Measuring frequency:	Monthly $EG_y (\text{Sub project}) = EG_{\text{export}} - 115\% * EG_{\text{import}} - \text{Transmission Loss (TE)}$
Reporting frequency:	Monthly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	Calculated
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not Applicable
Calibration frequency /interval:	Not Applicable
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications	Not Applicable
Is the calibration of measuring equipment carried out by an accredited person or institution?	Not Applicable
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Not Applicable
Is(are) calibration(s) valid for the whole reporting period?	Not Applicable
If applicable, has the reported data been cross-checked with other available data?	The values of net electricity exported were verified from the JMR and electricity sales invoices /4/
How were the values in the monitoring report verified?	The values of net electricity exported were verified from the JMR and electricity sales

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	invoices
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. The net electricity supplied to the grid has been used in the emission reduction calculation.
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not applicable

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	Electricity export (EG_{export}) and Electricity import (EG_{import}) recorded at the meters of subprojects
Measuring frequency:	Continuous
Reporting frequency:	Monthly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	Energy meters
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Yes. The meters have an accuracy class 0.2s, which is in line with the PDD and it represents good monitoring practise
Calibration frequency /interval:	Annual
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications	Yes. The calibration interval is in line with the monitoring plan of the PDD and the selected frequency represents good monitoring practice.
Is the calibration of measuring equipment carried out by an accredited person or institution?	Yes, Calibration of the meters are performed by HESCOM and BESCOM /3/9/, the state utilities
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes. Calibration confirmed proper functioning of meters. However delay of one day was noted for the investor, Enercon Wind Farms Pvt. Ltd,

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	EWFA-01. PP has applied the corrective action for delay in calibration as per section 238 of VVS.
Is(are) calibration(s) valid for the whole reporting period?	There was a gap in the validity of calibration for the meters of Enercon Wind Farms (Chitradurga) Ltd. during the month of June 2012. The subsequent calibration confirmed that the error of these meters to be within the specified limit and so as conservative approach, as per guidelines for assessing compliance with the calibration frequency requirements, the maximum permissible error +0.2% has been applied for calculating the transmission losses covering the set of readings for the delayed month. The calibration certificates have been checked and the details provided in the ER sheet are in order /2/. The detail of the calibration has been given in the excel sheet and monitoring report /1/, 2.
If applicable, has the reported data been cross-checked with other available data?	The values EG_{export} and EG_{import} are required for calculation of net electricity exported were cross checked with electricity sales invoices on state utility /4/.
How were the values in the monitoring report verified?	The values EG_{export} and EG_{import} are required for calculation of net electricity exported were verified from the energy breakup report of JMR /5/
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not applicable

Data / Parameter:	Transmission loss for export between the metering location at 33 kV metering point and the high voltage side of the substation to which the subproject is connected, T_E
Measuring frequency:	Calculated by the state utility as % difference between the electricity exported recorded by the meters at sub-station and

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	the total of net generation recorded by the meters of sub projects connected to it. The transmission losses are reported in joint meter reading.
Reporting frequency:	Monthly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	Calculated.
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	The Transmission losses are calculated as the difference between the measurements at the 33 kV yard and the 66 kV yard. All the meters involved for the calculation of the Transmission losses are of accuracy 0.2s. This has been mentioned under the revised monitoring plan approved by UNFCCC on 21 July 2011
Calibration frequency /interval:	The calibration frequency is once a year (annually) in accordance with the approved revised monitoring plan
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	The calibration of measuring equipment is carried out annually and this is in accordance with the revised monitoring plan approved by UNFCCC on 21 July 2011
Company performing the calibration:	Calibration of the meters are performed by HESCOM and BESCOM /3//9/, the state utilities
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes. Calibration confirmed proper functioning of meters. However delay in calibration was noted for the Enercon Sub-station at Imangala , GIM-II Sub-station at Gownalli and Gadag Sub-station at Banikoppa . PP has applied the corrective action for delay in calibration as per section 238 of VVS.
Is(are) calibration(s) valid for the whole reporting period?	There was a gap in the validity of calibration for the meters at Enercon Sub-station at Imangala during June 2012, GIM-II Sub-station at Gownalli during March to June 2012 and Gadag Sub-station at Banikoppa during July to October 2012. The subsequent calibration confirmed that the error of these meters to be within the specified limit and so as conservative approach, as per guidelines

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	for assessing compliance with the calibration frequency requirements, the maximum permissible error +0.2% has been applied for calculating the transmission losses covering the set of readings for the non-calibrated months. The calibration certificates have been checked and the details provided in the ER sheet are in order /2/.
If applicable, has the reported data been cross-checked with other available data?	The values of transmission losses were verified from the Invoices
How were the values in the monitoring report verified?	The values of net electricity exported were verified from the Invoices
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable

It has been observed that for M/s Gangadhar Narsingdas Agarwal, the main meter with serial no. 06675402 has been replaced by new meter with serial No. 06675390 on 25 January 2012. Calibration records and accreditation certificates have been provided to the verification team /8/. DNV confirms that the meters were calibrated covering this monitoring period as per the monitoring plan.

3.7 Assessment of data and calculation of emission reductions

DNV confirms that appropriate methods and formulae for calculating baseline emissions, project emissions and leakage have been followed, and the assumptions, emission factors and default values that are applied in the calculation have been justified.

As stated in the section 1.4, the emission reductions ER_y by the project activity during the monitoring period is the difference between the baseline emission, project emissions or leakage.

$$ER_y = BE_y - PE_y - L_y$$

3.7.1 Baseline emissions

Baseline emissions (BE_y in tCO_2) are the product of the baseline emission factor (EF_y in tCO_2/MWh) times the net electricity supplied by the project activity to the grid (EG_y in MWh).

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EF_y is emission factor of the grid, which was calculated *ex-ante* and will not be updated during the crediting period. EF_y of the proposed project in the revised PDD is 0.93204 tCO₂/MWh /14/.

EG_y is the net electricity generation supplied to the grid, which is determined by the electricity supplied to the grid minus the 115% of the imported electricity from the grid and transmission loss. The net electricity supplied by the sub projects to the grid was verified by DNV from the monthly JMR report, the electricity sales invoice.

$$EG_y (\text{Sub project}) = EG_{\text{export}} - 115\% * EG_{\text{import}} - \text{Transmission Loss (TE)}.$$

$$\begin{aligned} &= 68339.512 \text{ MWh} - 83.042 \text{ MWh} - 863.438 \text{ MWh} \\ &= 67393.032 \text{ MWh} \end{aligned}$$

Hence,

Baseline Emission for the period (01/09/2011 to 30/09/2012)

$$\begin{aligned} BE_y &= EF_y * EG_y \\ &= 67393.032 (\text{MWh}) * 0.93204 (\text{tCO}_2/\text{MWh}) = 62\,812 \text{ tCO}_2 \end{aligned}$$

The total net electricity exported during the verification period was 67393.032 MWh.

3.7.2 Project emissions

The project emissions are regarded as zero as the energy generated is from wind energy as detailed in the PDD and in line with the methodology ACM0002 version 6/19/.

3.7.3 Leakage

There are no leakages that need to be considered in applying the methodology ACM0002 version 6 /19/.

3.7.4 Emission reductions

Therefore, the emission reductions in this monitoring period are:

$$ER_y = BE_y - PE_y - L_y = 62\,812 - 0 - 0 = 62\,812 \text{ tCO}_2\text{e}.$$

The yearly expected emission reductions in the registered PDD are 65 774 tonnes of CO₂ equivalents, which correspond to the emission reductions of 71 360 tonnes of CO₂ equivalents in 396 days, and hence the reported emission reductions are considerably lower than the expected.

As outlined above, the input data for calculating the emission reductions, the calculating process and the result are complete and transparent. Therefore, DNV is able to confirm the accuracy of the emission reductions.

3.8 Quality of evidence to determine emission reductions

DNV confirms that a complete set of data for this monitoring period was available to be verified and was in accordance with the registered PDD /13/.

VERIFICATION / CERTIFICATION REPORT

All necessary documentation were collected, referenced and aggregated and were easily accessible in hard-copy and electronic format. Measurements are performed by calibrated equipment, and the key data were cross-checked against the invoices issued by for electricity sales invoices. No assumptions are used that have any material influence on reported emission reductions.

3.9 Management system and quality assurance

The owners of the sub projects have entered into a maintenance and services agreement with Enercon (India) Limited, /6/ which was verified during the site visit. The performance of the WEGs, safety in operation and scheduled / breakdown maintenance thereof are organized and monitored by EIL. EIL maintains records, in both electronic and well as printed (paper) form, of generation data of individual WEGs from the controllers of each WEG. EIL, the focal point for the project activity cross-checks the calculation of CERs based on monitoring data made available through JMR, break up energy reports and LCS readings, on behalf of the owners of the sub projects.

The management system for the project has been verified to be in place on site by DNV. The organization structure with the responsibilities, personnel competencies, monitoring procedure and monitoring management have been properly identified and put into operation. DNV confirms that the responsibilities and authorities in the management and operational system for monitoring and reporting are in accordance with the responsibilities and authorities stated in the registered PDD and monitoring plan /13//14/.

4 CERTIFICATION STATEMENT

DNV Climate Change Services AS (DNV) has performed the verification of the emission reductions that have been reported for the CDM project activity 1291 “Enercon Wind farms in Karnataka Bundled Project-30.4 MW” in India for the period 1 September 2011 to 30 September 2012.

The project participants are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

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

DNV conducted the verification on the basis of the baseline and monitoring methodology ACM0002 (version 06), the monitoring plan contained in the PDD (version 5 of version 6 incorporating notification of change of 16 April 2011) and the monitoring report (version 3) dated 03 January 2013. The verification included i) checking whether the provisions of the monitoring methodology and the monitoring plan were consistently and appropriately applied and ii) the collection of evidence supporting the reported data.

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

In our opinion the GHG emissions reductions reported for the project activity for the period 1 September 2011 to 30 September 2012 are fairly stated in the monitoring report (version 3) dated 03 January 2013.

The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology ACM0002 (version 06) and the monitoring plan contained in the PDD (version 5 of version 6 incorporating notification of change of 16 April 2011).

DNV Climate Change Services AS is able to certify that the emission reductions from the CDM project activity (1291) “Enercon Wind farms in Karnataka Bundled Project-30.4 MW” in India during the period 1 September 2011 to 30 September 2012 amount to 62 812 tonnes of CO₂ equivalent.

Bangalore and Oslo, 22 January 2013



Ravi Kumar Prabhu
CDM Verifier
DNV India



Edwin Aalders
Approver,
DNV Climate Change Services AS

5 REFERENCES

Documentation provided by the project participants

/1/	EIL: Monitoring Report version 01 dated 19 November 2012 and version 3 dated 3 January 2013.
/2/	EIL: Spread sheet for Emission reduction Calculations, version 01 dated 19 November 2012 and version 3 dated 3 January 2013.
/3/	HESCOM : Calibration certificates of the electricity meters of sub-projects covering the period of 1 September 2011 to 30 September 2012
/4/	EIL: Records of invoices raised by the project participant for the sale of power for the period of 1 September 2011 to 30 September 2012
/5/	EIL: Records of Joint meter readings at the wind farm site for the period of 1 September 2011 to 30 September 2012
/6/	EIL: O&M agreement between the subprojects with EIL, Records of monthly generation details in CMS and maintenance records for the period of 1 September 2011 to 30 September 2012.
/7/	HESCOM :The generation certificates for the verification period 1 September 2011 to 30 September 2012
/8/	HESCOM: Meter Replacement Records and Test reports for M/S G N Agarwal dated 25 January 2012.
/9/	HESCOM/BESCOM :The calibration certificates electricity meters located at the sub stations, for the period of 1 September 2011 to 30 September 2012

Other project documents or documents used by DNV to verify the information provided by the project participants

/10/	SGS: Validation report of the project activity, version 3 dated 25 October 2009.
/11/	DNV: Validation opinion for post registration changes dated 3 May 2011.
/12/	DNV: First Verification Report for the monitoring period 18 March 2010 to 31 August 2010 dated 5 October 2011; Second Verification Report for the monitoring period 1 September 2010 to 31 August 2011 dated 22 February 2012.
/13/	EIL: Registered PDD version 5, dated 23 February 2009
/14/	EIL: Revised PDD version 6 incorporating notification of change of 16 April 2011
/15/	CDM Executive Board: Notification of changes in PDD (version 6), approved on 16 June 2011
/16/	Revision of Monitoring Plan dated approved by UNFCCC on 21 July 2011.

Methodologies, tools and other guidance by the CDM Executive Board

/17/	CDM Executive Board: Validation and Verification Standards. Version 3
/18/	CDM Executive Board: Clean Development Mechanism Project Standard version 2
/19/	CDM Executive Board: ACM0002 version 06, Consolidated baseline methodology for grid connected electricity generation from renewable energy sources.

Persons interviewed during the verification

/20/	Ms Poorvi Joshi, Enercon (India) Ltd
/21/	Mr Manjunath. P, Enercon (India) Ltd.,
/22/	Mr. Bhupendra Verma, Enercon (India) Ltd.

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APPENDIX A

CORRECTIVE ACTION REQUESTS, CLARIFICATION REQUESTS AND FORWARD ACTION REQUESTS

Corrective action requests

CAR ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CAR 1	The typographical errors in the MR indicated during site visit need to be corrected and revised Monitoring report to be provided by PP.	The MR has been amended & revised version of MR has been submitted to DOE.	<p>Revised Monitoring report has been provided by PP after attuning all the typographical errors.</p> <p>DNV has reviewed the revised MR version 3 dated 3 January 2013 /1/ and found the same to be in order.</p> <p>OK Accepted</p> <p>CAR 1 Closed</p>

Clarification requests

CL ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CL 1	<p>The calibration records have not been provided by PP for the following listed project owners-</p> <ol style="list-style-type: none"> 1. Siddganga Oil Extraction: 2012 2. Abhilash Garments: 2012 3. Prasad Global Solution: 2012 4. Gangadhar Narsingdas Agarwal: 2012 <p>Gadag Sub-station at Banikoppa: 2012</p>	<p>The calibration records has been submitted to DOE along with revised version of MR.</p> <p>The calibration dates has been corrected for the said investors in the revised version of MR.</p>	<p>PP has furnished 2012 calibration records for the all the identified project owners, Siddganga Oil Extraction, Abhilash Garments, Prasad Global Solution, Gangadhar Narsingdas Agarwal and for Gadag Sub-station at Banikoppa /9/.</p> <p>DNV has also reviewed the revised MR, version 3 dated 3 January 2012 /1/, as provided by PP, and have cross verified the calibrations dates against provided records and found the same to be in order for all the machines.</p> <p>OK Accepted CL 1 Closed</p>

CL ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CL 2	The Joint meter reading (JMR) records for the month of September 2012 for all the project owners has not been provided by PP.	The Joint Meter Reading (JMR) for the month of September 2012 for all the project owners has been provided along with revised version of MR.	<p>PP has now provided the Joint Meter Readings for all the WEGs for the month September 2012 /5/.</p> <p>The JMRs has been cross checked by DNV and the values are in line with that mentioned in the excel worksheet used for ER calculations /2/ and found to be satisfactory.</p> <p>OK Accepted</p> <p>CL 2 Closed</p>

CL ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CL 3	The serial number of the main meter for Project owner Gangadhar Narsinghdas Agarwal as reported in MR (6675402) was not in line with that noted at the location during the site visit (06675390).	The meter has been replaced & the supporting document has been submitted to DOE along with revised version of MR.	<p>The main meter 6675402 for the project owner Gangadhar Narsinghdas Agarwal has been replaced with 06675390 during the month of 25 January 2012 /8/.</p> <p>PP has provided Test Report received from Hubli Electricity Supply company Ltd dated 25 Jan 2012, which specifically states that the Main meter with serial number 06675402 has been replaced by new meter with serial number 06675390. The test report also confirms the calibration of the meter and certifies that the percentage error of the meter is found within permissible limit.</p> <p>DNV has reviewed the Test records and found it to be satisfactory.</p> <p>OK Accepted</p> <p>CL 3 Closed.</p>

CL ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CL 4	The value for net electricity supplied to grid value reported in MR (61,367.199 MWh) is not found to be consistent with that reflected in excels worksheet (67,400.284 MWh).	The value for net electricity supplied to grid has been corrected in revised version of MR & ER calculation sheet & submitted to DOE.	<p>PP has attuned the value for net electricity supplied to grid in the MR with that in Excel sheet /1//2/ and has provided the revised MR.</p> <p>DNV has reviewed the revised MR version 3 dated 3 Jan 2013, and cross verified that the value for total net electricity supplied to grid is mentioned as 67393.032 MWh and the value is consistent with the excel worksheet.</p> <p>OK Accepted CL 4 Closed</p>
CL 5	The value of total ER calculations value mentioned in monitoring report (62,983) is not found to be consistent as compared to that mentioned in excel worksheet (62,819).	The value of ER has been corrected in the revised version of MR & ER calculation sheet.	<p>PP has corrected the value of total ER in the provided revised monitoring report.</p> <p>DNV has reviewed the revised MR version 3 dated 3 January 2013 and has cross verified the value of total ER as 62 812 and the same is consistent with that value reported in excel worksheet. The final ER value 62 812 is lesser than as provided in webhosted MR, as PP has now attuned generation value and has applied adjustment factor for the delayed calibration hence the change in value.</p> <p>OK Accepted CL 5 Closed</p>

CL ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants												
CL 6	<div>Delay in Calibration has been observed for the following project owners, last calibration valid till (06-06-12).</div> <table><tr><td>Abhilash Garments & Estates (P) Ltd:</td><td>GDG/TL & SS/WF/AGEM/Loc No - 11/46</td></tr><tr><td>Prasad Global Solutions</td><td>GDG/TL & SS/WF/AGEM/Loc No - 1/41</td></tr><tr><td>Prasad Global Solutions</td><td>GDG/TL & SS/WF/AGEM/Loc No - 17/50</td></tr><tr><td>Gangadhar Narsingdas Agarwal</td><td>GDG/TL & SS/WF/AGEM/Loc No - 12 & 13 /47</td></tr><tr><td>GangadharNarsin gdas Agarwal</td><td>GDG/TL & SS/WF/AGEM/Loc No - 6,7 & 8/45</td></tr><tr><td>Siddaganga Oil Extractions Ltd. Enercon Wind Farms Pvt. Ltd.</td><td>GDG/TL & SS/WF/AGEM/Loc No - 14 & 15/48 EWFA-01</td></tr></table> <div>However, the corrective action for delay in calibration as per section 238 of VVS has not been made. Delay in calibration was also noted for the Enercon Sub-station at Imangala, GIM-II Sub-station at Gownalli and Gadag Sub-station at Banikoppa .</div>	Abhilash Garments & Estates (P) Ltd:	GDG/TL & SS/WF/AGEM/Loc No - 11/46	Prasad Global Solutions	GDG/TL & SS/WF/AGEM/Loc No - 1/41	Prasad Global Solutions	GDG/TL & SS/WF/AGEM/Loc No - 17/50	Gangadhar Narsingdas Agarwal	GDG/TL & SS/WF/AGEM/Loc No - 12 & 13 /47	GangadharNarsin gdas Agarwal	GDG/TL & SS/WF/AGEM/Loc No - 6,7 & 8/45	Siddaganga Oil Extractions Ltd. Enercon Wind Farms Pvt. Ltd.	GDG/TL & SS/WF/AGEM/Loc No - 14 & 15/48 EWFA-01	<div>The corrective action for delay in calibration as per section 238 of VVS,has been applied in the revised version of ER sheet for Month June 2012 for Project owner Enercon Wind Farms (Chitradurga) Ltd. because of the delay in calibration.. The corrective action for delay for substation meters have been applied in calibration as per section 238 of VVS.</div>	<div>PP has provided all the calibration records for the listed project owners for year 2012 which reflects that that there is no delay in calibration for the installed meters. DNV has crosschecked the calibration records as provide by PP and confirms that no delay has been noted for the listed project owners. However, delay of one day was noted for meter for Enercon Wind Farms Pvt. Ltd, which has now been rectified. And PP has applied appropriate adjustment factor for the delay. Furthermore for the delay in calibration period for substation meters of Enercon Sub-station at Imangala , GIM-II Sub-station at Gownalli and Gadag Sub-station at Banikoppa , PP has appllied the correction factor and the revised excel worksheets have been submitted. DNV has reviewed the revised worksheet with application of adjustment factor for the meter of Enercon Wind Farms Pvt. Ltd and and for meters of Enercon Sub-station at Imangala , GIM-II Sub-station at Gownalli and Gadag Sub-station at Banikoppa found to be in line.</div> <div>OK Accepted CL 6 Closed</div>
Abhilash Garments & Estates (P) Ltd:	GDG/TL & SS/WF/AGEM/Loc No - 11/46														
Prasad Global Solutions	GDG/TL & SS/WF/AGEM/Loc No - 1/41														
Prasad Global Solutions	GDG/TL & SS/WF/AGEM/Loc No - 17/50														
Gangadhar Narsingdas Agarwal	GDG/TL & SS/WF/AGEM/Loc No - 12 & 13 /47														
GangadharNarsin gdas Agarwal	GDG/TL & SS/WF/AGEM/Loc No - 6,7 & 8/45														
Siddaganga Oil Extractions Ltd. Enercon Wind Farms Pvt. Ltd.	GDG/TL & SS/WF/AGEM/Loc No - 14 & 15/48 EWFA-01														

CL ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CL 7	The value of Net Energy Generated (kWh) for project owner- Gangadhar Narsingdas Agarwal-GDG/TL & SS/WF/GNAM/Loc No - 6, 7 & 8 /45, is not found to be consistent with the value reflected in JMR received from PP.	The value of Net Energy Generated for the project owner - Gangadhar Narsingdas Agarwal-GDG/TL & SS/WF/GNAM/Loc No - 6, 7 & 8 /45 is now consistent with the value in JMR in the revised version of ER calculation sheet.	PP has corrected the mismatch in the value of net energy generated for project owner – Gangadhar Narsingdas Agarwal, and has provided the revised worksheet /2/. DNV has reviewed the revised MR /1/version 3 dated 3 Jan 2013 and revised excel worksheet found the value to be consistent with JMR /6/ data. OK Accepted CL 7 Closed

Forward action requests from previous verification

FAR ID	Forward action request	Summary of how FAR has been addressed in this reporting period	Assessment of how FAR has been addressed
FAR 1	No FAR were identified in previous verification		

Forward action requests from this verification

FAR ID	Forward action request	Response by Project Participants	DNV's assessment of response by Project Participants
FAR 1	No FAR has been identified from this verification		

APPENDIX B

POST REGISTRATION CHANGES

Type of post registration change	Description of post registration change*	Is prior approval by CDM EB required**?	In case prior approval by CDM EB is required, when was post registration change approved?
Corrections		<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable	<i>Not applicable</i>
Temporary deviations from the registered monitoring plan and/or monitoring methodology	<i>(Refer also to 3.6 for the assessment of the parameter(s) which were temporarily not monitored)</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable	<i>Not applicable</i>
Permanent changes from the registered monitoring plan or applied methodology		<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable	<i>Not applicable</i>
Changes to the project design of a registered project activity		<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable	<i>Not applicable</i>

* For further details refer to the “Post-registration changes request form” (F-CDM-PRC) and DNV’s assessment opinion on the changes

** Refer to Appendix 1 Appendix 1 to the CDM Project Standard /18/

APPENDIX C

CURRICULA VITAE OF THE VERIFICATION TEAM MEMBERS

Mr. Ravi Kumar Prabhu

Mr. Ravi Kumar Prabhu holds Bachelor's Degree in Chemical Engineering and has done Post Graduate Diploma course in Management and has an overall working experience of around twenty eight years. Prior to joining DNV has around twenty three years of experience in Chemical process industry (fertilizer & petrochemical manufacturing) covering production, technical services including energy audits and efficiency studies, waste heat recovery, efficiency studies of boilers, power plants, safety audits, pollution control activities and waste water treatment. With respect to the Thermal Power Plant, the job assignment included the monitoring of flue gas stack temperatures and excess air, efficiency of fuel additives, condition of boiler refractory and insulation of steam lines, residual life assessment of boilers etc. His experience also includes 7 years in the Process design of fertilizer & petrochemical plants, wherein he was involved in the development of process flow diagrams, development of P&IDs, equipment design, HAZOP studies, procurement and commissioning activities. He has over four years of experience in validation and verification of CDM projects in DNV and is also an EMS lead auditor.

His qualification, industrial experience and experience in CDM projects demonstrate sufficient sectoral competence in Chemical Process Industries (TA 5.1), Thermal Energy Generation from fossil fuels (TA 1.1), Heat distribution (TA 2.2), Energy generation from Renewable Energy sources (TA 1.2) and Waste handling and disposal (TA 13.1).

Shilpa Swarnim

Shilpa Swarnim holds a Masters degree in Science with major in Biotechnology. She has been previously associated with Indian Institute of Science, Bangalore as Research Assistant. She has also worked as Lecturer in Bangalore University affiliated college and her subjects of interest were Environmental Science and Climate change. With total experience of approx 6 years into Research and Academics her topic of research centers around issues related to Forestry, Environment, Climate change impact on forest ecosystems, studying the climate impact modeling for future predictions of climatic and vegetation dynamics. She has completed ISO 14001:2004 - Environmental Management System Auditor / Lead Auditor Program, certified by IRCA along with DNV Training Programme on Corporate GHG Inventory.

Currently working in DNV AS, Bangalore unit, as Project manager, she is involved in the Validation and Verification of CDM projects pertaining to various sectors.

Seshan Ranganathan

Seshan Ranganathan, holds a Bachelor's Degree in Chemical Engineering and has done diploma course in Management and completed the graduate ship course in Industrial Engineering and has an overall working experience of around twenty nine years. Prior to joining DNV has around twenty four years of experience in Chemical process industry (fertilizer & petrochemical manufacturing) covering production, technical services including energy audits and efficiency studies, waste heat recovery, efficiency studies of boilers, power plants, safety audits and pollution control activities including waste water treatment, project management, corporate planning, sales, logistics in fertilizer & petrochemical industry. With respect to the thermal power plant the job assignment included the monitoring of flue gas exit

temperatures, excess air used efficiency of fuel additives, condition of boiler refractory, insulation of steam lines etc. The experience also includes 5 years in process design & engineering for chemical process industry.

He is qualified validator and verifier for CDM projects and is carrying out the same for the past five years. He has completed the EMS lead auditor course. His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in areas of (a) 1.1 Thermal energy generation from fossil fuels and Biomass including thermal electricity from solar (b) 1.2 Energy generation from renewable energy sources (c) 2.2 Heat distribution (d) 5.1/11.1/12.1 Chemical Processes Industries and (e) 13.1 Waste handling and disposal.

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