



# FINAL VERIFICATION REPORT

- 1<sup>ST</sup> PERIODIC -

ENERCON (INDIA) LTD

ENERCON WIND FARM (HINDUSTAN) LTD IN KARNATAKA

UNFCCC REF. No.: 1259

Monitoring Period: 2008-10-27 to 2009-11-30 (incl. both days)

**Report No: 53606409-09/453**

**Date: 2011-07-16**

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<b>Verification Report:</b>	<b>Report No.</b>	<b>Rev. No.</b>	<b>Date of 1<sup>st</sup> issue:</b>	<b>Date of this rev.</b>
	53606409-09/453	0	2011-07-16	2011-07-16
<b>Project:</b>	<b>Title:</b>	<b>Registration date:</b>	<b>UNFCCC-No.:</b>	
	Enercon Wind Farm (Hindustan) Ltd in Karnataka	2008-10-27	1259	
<b>Project Participant(s):</b>	<b>Host party:</b>	<b>Other involved parties:</b>		
	India	United Kingdom of Great Britain and Northern Ireland		
<b>Applied methodology/ies:</b>	<b>Title:</b>	<b>No.:</b>	<b>Scope:</b>	
	Consolidated methodology for grid-connected electricity generation from renewable sources	ACM 0002, ver 06	01	
<b>Monitoring:</b>	<b>Monitoring period (MP):</b>	<b>No. of days:</b>	<b>MP No.</b>	
	2008-10-27 to 2009-11-30 (both days included)	400	1	
<b>Monitoring report:</b>	<b>Title:</b>	<b>Draft version:</b>	<b>Final version:</b>	
	Enercon Wind Farm (Hindustan) Ltd in Karnataka	2009-12-30	2011-07-01, version 05	
<b>Verification team / Technical Review and Final Approval</b>	<b>Verification Team:</b>	<b>Technical review:</b>	<b>Final approval:</b>	
	Mr. Ma.Paa. Mr. R. Murali (TM) Puratchikkanal (TL) Ms. Manjari Ms. C. Indumathi (TE) Chandra(TM)	Ingo Klein	Rainer Winter	
<b>Emission reductions: [t CO<sub>2e</sub>]</b>	<b>Verified amount</b>	<b>As per draft MR:</b>	<b>As per PDD:</b>	
	114,191	114,429 t	148,858 t /Year	
<b>Summary of Verification Opinion:</b>	<p>Enercon (India) Limited has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 1<sup>st</sup> periodic verification of the project: "Enercon Wind Farm (Hindustan) Ltd in Karnataka", with regard to the relevant requirements for CDM project activities. The project reduces GHG emissions due to the generation of electricity from wind energy. The project activity consists of 86 WEGs and each machine capacity is of 800 kW totaling to the capacity of 68.8 MW generating electricity to be supplied to the Southern Grid. This verification covers the period from 2008-10-27 to 2009-11-30 (including both days).</p> <p>In the course of the verification 5 Corrective Action Requests (CAR) and 1 Clarification Requests (CL) were raised and successfully closed. The verification is based on the draft monitoring report, revised monitoring report, the monitoring plan as set out in the registered PDD, the validation report, emission reduction calculation spreadsheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.</p> <p>As a result of this verification, the verifier confirms that:</p> <ul style="list-style-type: none"><li>• All operations of the project are implemented and installed as planned and described in the validated project design document.</li><li>• The monitoring plan is in accordance with the applied approved CDM methodology ,i.e., ACM0002 Ver 6.0.</li><li>• The installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately.</li><li>• The monitoring system is in place and functional. The project has generated GHG emission reductions.</li></ul> <p>As the result of the 1<sup>st</sup> periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:</p> <p>Emission reductions: <b>114,191</b> t CO<sub>2e</sub></p>			



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## **Abbreviations:**

<b>CA</b>	<b>Corrective Action / Clarification Action</b>
<b>CAR</b>	<b>Corrective Action Request</b>
<b>CDM</b>	<b>Clean Development Mechanism</b>
<b>CER</b>	<b>Certified Emission Reduction</b>
<b>CO<sub>2</sub></b>	<b>Carbon dioxide</b>
<b>CO<sub>2eq</sub></b>	<b>Carbon dioxide equivalent</b>
<b>CL</b>	<b>Clarification Request</b>
<b>EIL</b>	<b>Enercon (India) Limited</b>
<b>ER</b>	<b>Emission Reduction</b>
<b>FAR</b>	<b>Forward Action Request</b>
<b>GHG</b>	<b>Greenhouse gas(es)</b>
<b>WEGs</b>	<b>Wind Energy Generators</b>
<b>JMR</b>	<b>Joint Meter Reading Report</b>
<b>KPTCL</b>	<b>Karnataka Power Transmission Corporation Limited</b>
<b>BESCOM</b>	<b>Bangalore Electricity Supply Company Limited</b>
<b>MoEF</b>	<b>Ministry of Environment and Forests</b>
<b>MP</b>	<b>Monitoring Plan</b>
<b>MR</b>	<b>Monitoring Report</b>
<b>PDD</b>	<b>Project Design Document</b>
<b>PP</b>	<b>Project Participant</b>
<b>PPA</b>	<b>Power Purchase Agreement</b>
<b>QA/QC</b>	<b>Quality Assurance / Quality Control</b>
<b>UNFCCC</b>	<b>United Nations Framework Convention on Climate Change</b>
<b>XLS</b>	<b>Emission Reduction Calculation Spread Sheet</b>

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## 1. INTRODUCTION

Enercon (India) Ltd has commissioned the TÜV NORD JI/CDM Certification Program (CP) to carry out the 1<sup>st</sup> periodic verification of the project

*"Enercon Wind Farm (Hindustan) Ltd in Karnataka"*

with regard to the relevant requirements for CDM project activities. The verifiers have reviewed the implementation of the approved revised monitoring plan (MP) in the registered CDM project number 1259<sup>1</sup>.

GHG data for the monitoring period covering 2008-10-27 to 2009-11-30 (both days included) was verified in detailed manner applying the set of requirements, audit practices and principles as required under the Validation and Verification Manual <sup>/VVM/</sup> of the UNFCCC.

This report summarizes the findings and conclusions of this 1<sup>st</sup> periodic verification of the above mentioned UNFCCC registered project activity.

### 1.1. Objective

The objective of the verification is the review and ex-post determination by an independent entity of the GHG emission reductions. It includes the verification of the:

- Implementation and operation of the project activity as given in the PDD,
- Compliance with applied approved methodology and the provisions of the monitoring plan,
- Data given in the monitoring report by checking the monitoring records, the emissions reduction calculation and supporting evidence,
- Accuracy of the monitoring equipment,
- Quality of evidence,
- Significance of reporting risks and risks of material misstatements.

### 1.2. Scope

The verification of this registered project is based on the validated project design document <sup>/PDD/</sup>, the monitoring report <sup>/MR5/</sup>, emission reduction calculation spreadsheet <sup>/XLS4/</sup>, supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment <sup>/SV/</sup>. Furthermore publicly available information was considered as far as available and required.

The verification is carried out on the basis of the following requirements, applicable for this project activity:

- Article 12 of the Kyoto Protocol <sup>/KP/</sup>,

<sup>1</sup> <http://cdm.unfccc.int/Projects/DB/DNV-CUK1185356859.49/view>



- guidelines for the implementation of Article 12 of the Kyoto Protocol as presented in the Marrakech Accords under decision 3/CMP.1 <sup>/MA/</sup>, and subsequent decisions made by the Executive Board and COP/MOP,
- other relevant rules, including the host country legislation,
- CDM Validation and Verification Manual <sup>/VVM/</sup>,
- monitoring plan as given in the registered PDD <sup>/PDD/</sup>,
- Approved CDM Methodology ACM0002 Version 6.0 (2006-05-19), "Consolidated methodology for grid-connected electricity generation from renewable sources".



## 2. GHG PROJECT DESCRIPTION

### 2.1. Project Characteristics

Essential data of the project is presented in the following Table 2-1.

**Table 2-1:** Project Characteristics

Item	Data
Project title	Enercon Wind Farm (Hindustan) Ltd in Karnataka
Project size	<input checked="" type="checkbox"/> Large Scale <input type="checkbox"/> Small Scale
Project Scope (according to UNFCCC sectoral scope numbers for CDM)	<input checked="" type="checkbox"/> 1 Energy Industries (renewable- /non-renewable sources)
	<input type="checkbox"/> 2 Energy distribution
	<input type="checkbox"/> 3 Energy demand
	<input type="checkbox"/> 4 Manufacturing industries
	<input type="checkbox"/> 5 Chemical industry
	<input type="checkbox"/> 6 Construction
	<input type="checkbox"/> 7 Transport
	<input type="checkbox"/> 8 Mining/Mineral production
	<input type="checkbox"/> 9 Metal production
	<input type="checkbox"/> 10 Fugitive emissions from fuels (solid, oil and gas)
	<input type="checkbox"/> 11 Fugitive emissions from production and consumption of halocarbons and hexafluoride
	<input type="checkbox"/> 12 Solvents use
	<input type="checkbox"/> 13 Waste handling and disposal
	<input type="checkbox"/> 14 Afforestation and Reforestation
	<input type="checkbox"/> 15 Agriculture
Applied Methodology	ACM0002 "Consolidated methodology for grid-connected electricity generation from renewable sources", version 6
Technical Area(s)	1.2: Renewable Energies
CDM registration No.	1259
Crediting period	<input type="checkbox"/> Renewable Crediting Period (7 y) <input checked="" type="checkbox"/> Fixed Crediting Period (10 y)

### 2.2. Project Verification History

Essential events since the registration of the project are presented in the following Table 2-2.

**Table 2-2:** Project verification history

#	Item	Time	Status
1	Date of registration	2008-10-27	Registered
2	Start of crediting period	2008-10-27	As per UNFCCC website
3	Approval of Revision of monitoring plan	2011-03-15	Approved
4	1 <sup>st</sup> Monitoring period	2008-10-27 to 2009-11-30	Awaiting issuance request

## 2.3. Involved Parties and Project Participants

The following parties to the Kyoto Protocol and project participants are involved in this project activity (Table 2-3).

**Table 2-3:** Project Parties and project participants

Characteristic	Party	Project Participant
Host party	India	Enercon (India) Ltd
Other involved party	United Kingdom of Great Britain and Northern Ireland	Coöperatieve Centrale Raiffeisen-Boerenleenbank B.A. (trading as Rabo Bank International)

## 2.4. Project Location

The details of the project location are given in table 2-4:

**Table 2-4:** Project Location

No.	Project Location
Host Country	India
Region:	South India, Karnataka

Latitude and Longitude of WEGs belonging to the project

Sl. No	WEG Unique Identification Number	Location No.	Latitude			Longitude		
			Degree	Minutes	Seconds	Degree	Minutes	Seconds
1	EWHP1 01	1	13	43	20.9	76	31	3.9
2	EWHP1 02	2	13	43	25.4	76	31	1.5
3	EWHP1 03	3	13	43	30.0	76	30	59.0
4	EWHP1 04	4	13	43	34.6	76	30	57.2
5	EWHP1 05	5	13	43	39.3	76	30	55.6
6	EWHP1 06	6	13	43	43.8	76	30	53.1
7	EWHP1 07	7	13	43	50.0	76	30	50.5
8	EWHP1 08	8	13	43	54.5	76	30	48.0
9	EWHP1 09	9	13	44	3.9	76	30	44.9
10	EWHP1 10	10	13	45	33.0	76	31	5.9
11	EWHP1 11	11	13	45	28.2	76	31	6.4
12	EWHP1 12	12	13	45	23.4	76	31	7.0
13	EWHP1 13	13	13	45	18.9	76	31	7.7
14	EWHP1 14	14	13	45	14.3	76	31	8.3
15	EWHP1 15	15	13	45	10.2	76	31	9.5
16	EWHP1 16	16	13	44	54.0	76	31	12.3
17	EWHP1 17	17	13	44	49.2	76	31	13.1
18	EWHP1 18	18	13	44	44.5	76	31	14.7
19	EWHP1 19	19	13	44	39.8	76	31	16.7
20	EWHP1 20	20	13	44	35.4	76	31	19.9
21	EWHP1 21	21	13	44	30.5	76	31	19.8

Sl. No	WEG Unique Identification Number	Location No.	Latitude			Longitude		
			Degree	Minutes	Seconds	Degree	Minutes	Seconds
22	EWHPL 22	22	13	44	25.6	76	31	20.2
23	EWHPL 23	23	13	44	21.7	76	31	26.4
24	EWHPL 24	24	13	44	16.9	76	31	27.7
25	EWHPL 25	25	13	44	12.0	76	31	28.2
26	EWHPL26	26	13	44	8.0	76	31	29.8
27	EWHPL 27	27	13	43	57.6	76	31	53.8
28	EWHPL 28	28	13	43	54.1	76	31	55.1
29	EWHPL 29	29	13	43	49.5	76	31	57.1
30	EWHPL 30	30	13	43	44.8	76	31	58.6
31	EWHPL 31	31	13	43	40.0	76	31	59.5
32	EWHPL 32	32	13	43	35.4	76	32	1.9
33	EWHPL 33	33	13	43	30.6	76	32	4.8
34	EWHPL 34	34	13	43	0.6	76	32	22.1
35	EWHPL 35	35	13	42	54.7	76	32	19.9
36	EWHPL 36	36	13	42	50.3	76	32	23.0
37	EWHPL 37	37	13	42	45.6	76	32	24.7
38	EWHPL 38	38	13	42	40.9	76	32	26.3
39	EWHPL 39	39	13	42	36.3	76	32	28.5
40	EWHPL 40	40	13	42	31.1	76	32	31.4
41	EWHPL 41	41	13	40	57.2	76	35	58.1
42	EWHPL 42	42	13	40	52.4	76	35	59.4
43	EWHPL 43	43	13	40	47.7	76	36	0.9
44	EWHPL 44	44	13	40	43.1	76	36	2.6
45	EWHPL 45	45	13	40	38.4	76	36	4.2
46	EWHPL 46	46	13	40	33.7	76	36	5.8
47	EWHPL 47	47	13	40	13.7	76	36	10.7
48	EWHPL 48	48	13	40	9.1	76	36	12.6
49	EWHPL 49	49	13	40	4.7	76	36	15.7
50	EWHPL 50	50	13	39	2.8	76	36	34.8
51	EWHPL 51	51	13	38	58.7	76	36	36.8
52	EWHPL 52	52	13	38	54.1	76	36	38.9
53	EWHPL 53	53	13	38	49.5	76	36	41.3
54	EWHPL 54	54	13	38	44.9	76	36	43.1
55	EWHPL 55	55	13	38	40.2	76	36	44.9
56	EWHPL 56	56	13	38	35.6	76	36	46.9
57	EWHPL 57	57	13	38	30.9	76	36	48.7
58	EWHPL 58	58	13	38	26.4	76	36	50.9
59	EWHPL 59	59	13	38	22.3	76	36	56.3
60	EWHPL 60	60	13	38	17.8	76	36	58.8
61	EWHPL 61	61	13	38	11.8	76	37	2.5
62	EWHPL 62	62	13	38	7.2	76	37	4.6
63	EWHPL 63	63	13	38	2.6	76	37	6.8
64	EWHPL 64	64	13	37	58.0	76	37	9.2
65	EWHPL 65	65	13	37	53.5	76	37	11.5
66	EWHPL 66	66	13	37	48.9	76	37	13.7

Sl. No	WEG Unique Identification Number	Location No.	Latitude			Longitude		
			Degree	Minutes	Seconds	Degree	Minutes	Seconds
67	EWHP 67	67	13	37	44.3	76	37	16.0
68	EWHP 68	68	13	37	39.8	76	37	18.4
69	EWHP 69	69	13	37	35.1	76	37	20.3
70	EWHP 70	70	13	37	30.5	76	37	22.3
71	EWHP 71	71	13	37	25.9	76	37	24.7
72	EWHP 72	72	13	32	25.1	76	43	45.2
73	EWHP 73	73	13	32	30.0	76	43	44.4
74	EWHP 74	74	13	32	34.8	76	43	44.7
75	EWHP 75	75	13	32	39.7	76	43	44.5
76	EWHP 76	76	13	32	44.6	76	43	43.9
77	EWHP 77	77	13	32	49.5	76	43	42.5
78	EWHP 78	78	13	32	54.4	76	43	42.1
79	EWHP 79	79	13	33	6.1	76	43	33.2
80	EWHP 80	80	13	33	11.0	76	43	34.1
81	EWHP 81	81	13	33	15.9	76	43	34.6
82	EWHP 82	82	13	33	20.8	76	43	34.5
83	EWHP 83	83	13	34	19.9	76	44	0.8
84	EWHP 84	84	13	34	27.5	76	44	2.3
85	EWHP 85	85	13	34	50.5	76	44	14.8
86	EWHP 86	86	13	34	54.9	76	44	14.8

## 2.5. Technical Project Description

The project activity comprises of 86 numbers of WEGs with a capacity of 800 kW each. The model used in the project activity is E-48 supplied by Enercon (India) Ltd.

The key parameters for the project are given in table 2-5:

**Table 2-5:** Technical data of the plant<sup>TD/</sup>

Parameter	Unit	Value
Rotor diameter	m	48
Hub-height	m	56.85
Power regulation	-	Independent electro-mechanical pitch system for each blade
No. of blades	-	3
Gear-box type	-	Gearless
Generator type	-	Synchronous generator
Output voltage	V	400

The net electricity generated is measured by the energy meters installed by Karnataka Power Transmission Corporation Limited (KPTCL). The plant exported net 122.526 GWh of electricity to the grid during the monitoring period 2008-10-27 to 2009-11-30(both days included).

The details of the energy meters are as follows:

**Table 2-5 (b) (i): Details of the project site energy meters for 56.8MW**

RR No: KBCWP-02	Main meter	Check meter
Type	Tri-vector meter	Tri-vector meter
Make	L & T	L & T
Class	0.2s	0.2s
Serial No.	05389967	05389970
Date of Calibrations	2008-01-02	2008-01-02
	2009-12-14	2009-12-14

**Table 2-5 (b) (ii): Details of the project site energy meters for 12.0MW**

RR No: KBCWP-03	Main meter	Check meter
Type	Tri-vector meter	Tri-vector meter
Make	L & T	L & T
Class	0.2s	0.2s
Serial No.	05463844	05463845
Date of Calibrations	2008-02-06	2008-02-06
	2010-04-16	2010-04-16

**Table 2-5 (b) (iii): Details of the Bulk energy meters in pooling station**

RR No: KBCWP-01	Main meter	Check meter
Type	Tri-vector meter	Tri-vector meter
Make	L & T	L & T
Class	0.2s	0.2s
Serial No.	06605121	06605122
Date of Calibrations	2008-02-06	2008-02-06
	2009-06-17	2009-06-17
	2009-09-29	2009-09-29
	2009-12-30	2009-12-30

During the first verification it was found that there is no change of the capacity of the wind turbine generators were used under the project activity. Also the project complies with all relevant statutory requirements. The amount of emission reductions over the monitoring period from 2008-10-27 to 2009-11-30 including both day is **114,191 tCO<sub>2</sub>**.

### 3. METHODOLOGY AND VERIFICATION SEQUENCE

#### 3.1. Verification Steps

The verification consisted of the following steps:

- Contract review
- Appointment of team members and technical reviewers
- Publication of the monitoring report
- A desk review of the Monitoring Report<sup>/MR2/</sup> submitted by the client and additional supporting documents with the use of customised verification protocol<sup>/CPM/</sup> according to the Validation and Verification Manual<sup>/VVM/</sup>,
- Verification planning,
- On-Site assessment,
- Background investigation and follow-up interviews with personnel of the project developer and its contractors,
- Draft verification reporting
- Resolution of corrective actions (if any)
- Final verification reporting
- Technical review
- Final approval of the verification.

The sequence of the verification is given in the table 3.1 below:

**Table 3.1:** Verification sequence

Topic	Time
Assignment of verification	2009-10-16
Uploading of Monitoring Report	2010-02-08
On-site visit	2010-02-25 and 2010-02-26
Draft reporting finalised	2011-04-19
Final reporting finalised	2011-07-16
Technical review finalised	2011-07-16

### 3.2. Contract review

To assure that

- the project falls within the scopes for which accreditation is held,
- the necessary competences to carry out the verification can be provided,
- Impartiality issues are clear and in line with the CDM accreditation requirements

a contract review was carried out before the contract was signed.

### 3.3. Appointment of team members and technical reviewers

On the basis of a competence analysis and individual availabilities a verification team, consistent of one team leader and 3 additional team members, was appointed. Furthermore also the personnel for observation, the technical review and the final approval were determined.

The list of involved personnel, the tasks assigned and the qualification status are summarized in the table 3-1 below.

**Table 3-1:** Involved Personnel

	Name	Company	Function <sup>1)</sup>	Qualification Status <sup>2)</sup>	Scheme competence <sup>3)</sup>	Technical competence <sup>4)</sup>	Verification competence	Host country Competence	Team Leading competence
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Ma. Paa. Puratchikkanal	TÜV India Pvt. Ltd. ,Bangalore	TL <sup>A)</sup>	SA	<input checked="" type="checkbox"/>	1.2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Mr. <input checked="" type="checkbox"/> Ms.	C. Indumathi	TÜV India Pvt. Ltd. ,Bangalore	TM <sup>A)</sup>	A/TE	<input checked="" type="checkbox"/>	1.2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Mr. <input checked="" type="checkbox"/> Ms.	Manjari Chandra	TÜV India Pvt. Ltd. ,Bangalore	TM <sup>A)</sup>	A	<input checked="" type="checkbox"/>	1.2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	R. Murali	TÜV India Pvt. Ltd. ,Bangalore	TM <sup>A)</sup>	LA	<input checked="" type="checkbox"/>	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Mr.	Klein Ingo	TÜV NORD	TR <sup>B)</sup>	LA	<input checked="" type="checkbox"/>	1.2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Name	Company	Function <sup>1)</sup>	Qualification Status <sup>2)</sup>	Scheme competence <sup>3)</sup>	Technical competence <sup>4)</sup>	Verification competence	Host country Competence	Team Leading competence
<input type="checkbox"/> Ms.		CERT, Germany							
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Rainer Winter	TÜV NORD CERT, Germany	FA <sup>B)</sup>	SA	<input checked="" type="checkbox"/>	1.2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<sup>1)</sup> TL: Team Leader; TM: Team Member, TR: Technical review; OT: Observer-Team, OR: Observer-TR; FA: Final approval

<sup>2)</sup> GHG Auditor Status: A: Assessor; LA: Lead Assessor; SA: Senior Assessor; T: Trainee; TE: Technical Expert

<sup>3)</sup> GHG auditor status (at least Assessor)

<sup>4)</sup> As per S01-MU03 or S01-VA070-A2 (such as 1.1, 1.2, ...)

A) Team Member: GHG auditor (at least Assessor status), Technical Expert (incl. Host Country Expert or Verification Expert), not ETE

B) No team member

Statements of competence for the above mentioned team members are enclosed in annex 2 of this report.

### 3.4. Publication of the Monitoring Report

In accordance with the CDM M&P (§ 62) the draft monitoring report, as received from the project participants, has been made publicly available on the dedicated UNFCCC CDM website prior to the verification activity commenced. Comments received are taken into account in the course of the verification, if applicable.

### 3.5. Verification Planning

In order to ensure a complete, transparent and timely execution of the verification task the team leader has planned the complete sequence of events necessary to arrive at a substantiated final verification opinion.

Various tools have been established in order to ensure an effective verification planning.

Risk analysis and detailed audit testing planning



For the identification of potential reporting risks and the necessary detailed audit testing procedures for residual risk areas table A-1 is used. The structure and content of this table is given in table 3-2 below.

**Table 3-2:** Table A-1; Identification of verification risk areas

<b>Table A-1: GHG calculation procedures and management control testing / Detailed audit testing of residual risk areas and random testing</b>				
<b>Identification of potential reporting risk</b>	<b>Identification, assessment and testing of management controls</b>	<b>Areas of residual risks</b>	<b>Additional verification testing performed</b>	<b>Conclusions and Areas Requiring Improvement (including Forward Action Requests)</b>
<i>The following potential risks were identified and divided and structured according to the possible areas of occurrence.</i>	<i>The potential risks of raw data generation have been identified in the course of the monitoring system implementation. The following measures were taken in order to minimize the corresponding risks.</i>  <i>The following measures are implemented:</i>	<i>Despite the measures implemented in order to reduce the occurrence probability the following residual risks remain and have to be addressed in the course of every verification.</i>	<i>The additional verification testing performed is described. Testing may include:</i> <ul style="list-style-type: none"> <li>- Sample cross checking of manual transfers of data</li> <li>- Recalculation</li> <li>- Spreadsheet 'walk through' to check links and equations</li> <li>- Inspection of calibration and maintenance records for key equipment</li> <li>- Check sampling analysis results</li> </ul> <i>Discussions with process engineers who have detailed knowledge of process uncertainty/error bands.</i>	<i>Having investigated the residual risks, the conclusions should be noted here. Errors and uncertainties are highlighted.</i>

The completed table A-1 is enclosed in the annex 1 (table A-1) to this report.

#### Project specific periodic verification checklist

In order to ensure transparency and consideration of all relevant assessment criteria, a project specific verification protocol has been developed. The protocol shows, in a transparent manner, criteria and requirements, means and results of the verification. The verification protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet for verification
- It ensures a transparent verification process where the verifying DOE documents how a particular requirement has been proved and the result of the verification.

The basic structure of this project specific verification protocol for the periodic verification is described in table 3-3.

**Table 3-3:** Structure of the project specific periodic verification checklist

<b>Table A-2: Periodic verification checklist</b>				
<b>Checklist Item</b>	<b>Reference</b>	<b>Verification Team Comments</b>	<b>Draft Conclusion</b>	<b>Final Conclusion</b>
<i>The checklist items in Table A-2 are linked to the various requirements the monitoring of the project should meet. The checklist is organised in various sections as per the requirements of the topic and the individual project activity. It further includes guidance for the verification team.</i>	<i>Gives reference to the information source on which the assessment is based on.</i>	<i>The section is used to elaborate and discuss the checklist item in detail. It includes the assessment of the verification team and how the assessment was carried out. The reporting requirements of the VVM shall be covered in this section.</i>	<i>Assessment based on evidence provided if the criterion is fulfilled (OK), or a CAR, CL or FAR (see below) is raised. The assessment refers to the draft verification stage.</i>	<i>In case of a corrective action or a clarification the final assessment at the final verification stage is given.</i>

The periodic verification checklist (verification protocol) is the backbone of the complete verification starting from the desk review until final assessment. Detailed assessments and findings are discussed within this checklist and not necessarily repeated in the main text of this report.

The completed verification protocol is enclosed in the annex (table A-2) to this report.

### 3.6. Desk review

During the desk review all documents initially provided by the client and publicly available documents relevant for the verification were reviewed. The main documents are listed below:

- The last revision of the PDD including the monitoring plan<sup>/PDD/</sup>,
- The last revision of the validation report<sup>/VAL/</sup>,
- The monitoring report, including the claimed emission reductions for the project<sup>/MR5/</sup>,
- The emission reduction calculation spreadsheet<sup>/XLS4/</sup>.

Other supporting documents, such as publicly available information on the UNFCCC website and background information were also reviewed.

### 3.7. On-site assessment

As most essential part of the verification exercise it is indispensable to carry out an inspection on site in order to verify that the project is implemented in accordance with the applicable criteria. Furthermore the on-site assessment is necessary to check the monitoring data with respect to accuracy to ensure the calculation of emission reductions. The main tasks covered during the site visit include, but are not limited to:

- The on-site assessment included an investigation of whether all relevant equipment is installed and works as anticipated.
- The operating staff was interviewed and observed in order to check the risks of inappropriate operation and data collection procedures.
- Information processes for generating, aggregating and reporting the selected monitored parameters were reviewed.
- The duly calibration of all metering equipment was checked.
- The monitoring processes, routines and documentations were audited to check their proper application.
- The monitoring data were checked completely.
- The data aggregation trails were checked via spot sample down to the level of the meter recordings.

Two member of the verification team attended the site visit.

Before and during the on-site visit the verification team performed interviews with the project participants to confirm selected information and to resolve issues identified in the document review.

Representatives of Enercon (India) Ltd, project proponenet and project consultant including the operational staff of the plant were interviewed. The main topics of the interviews are summarised in Table 3-4.

**Table 3-4:** Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
Projects & Operations Personnel, Mr. Manjunath, DGM, Enercon (India) Ltd, O&M Service providers /IM01/	<ul style="list-style-type: none"> <li>- Technical equipment and operation</li> <li>- Monitoring and measurement equipment</li> <li>- Involved personnel and responsibilities</li> <li>- Monitoring data management General aspects of the project</li> </ul>
Consultant, Mr. Saujanya Kumar, CDM Consultant, Enercon (India) Ltd /IM01 & IM02/	<ul style="list-style-type: none"> <li>- Calibration procedures</li> <li>- Quality management system</li> <li>- Data uncertainty and residual risks</li> <li>- GHG calculation</li> <li>- Procedural aspects of the verification</li> </ul>

Interviewed Persons / Entities	Interview topics
	<ul style="list-style-type: none"><li>- Implementation of the monitoring plan</li><li>- Maintenance</li></ul>

### 3.8. Draft verification reporting

On the basis of the desk review, the on-site visit, follow-up interviews and further background investigation the verification protocol is completed. This protocol together with a general project and procedural description of the verification and a detailed list of the verification findings form the draft verification report. This report is sent to the client for resolution of raised CARs, CLs and FARs.

### 3.9. Resolution of CARs, CLs and FARs

Nonconformities raised during the verification can either be seen as a non-fulfilment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified.

Corrective Action Requests (CARs) are issued, if:

- Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
- Issues identified in a FAR during validation or previous verifications requiring actions by the project participants to be verified during verification have not been resolved.

The verification team uses the term Clarification Request (CL), which is issued if:

- Information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

Forward Action Requests (FAR) indicate essential risks for further periodic verifications. Forward Action Requests are issued, if:

- The monitoring and reporting require attention and / or adjustment for the next verification period.

For a detailed list of all CARs, CLs and FARs raised in the course of the verification pl. refer to chapter 4.

### **3.10. Final reporting**

Upon successful closure of all raised CARs and CLs the final verification report including a positive verification opinion can be issued. In case not all essential issues could finally be resolved, a final report including a negative verification opinion is issued.

The final report summarizes the final assessments w.r.t. all applicable criteria.

### **3.11. Technical review**

Before submission of the final verification report a technical review of the whole verification procedure is carried out. The technical reviewer is a competent GHG auditor being appointed for the scope this project falls under. The technical reviewer is not considered to be part of the verification team and thus not involved in the decision making process up to the technical review.

As a result of the technical review process the verification opinion and the topic specific assessments as prepared by the verification team leader may be confirmed or revised. Furthermore reporting improvements might be achieved.

### **3.12. Final approval**

After successful technical review an overall (esp. procedural) assessment of the complete verification will be carried out by a senior assessor located in the accredited premises of TÜV NORD.

After this step the request for issuance can be started.

## 4. VERIFICATION FINDINGS

In the following paragraphs the findings from the desk review of the monitoring report<sup>/MR5/</sup>, the calculation spreadsheet<sup>/XLS4/</sup>, PDD<sup>/PDD/</sup>, the Validation Report<sup>/VAL/</sup> and other supporting documents, as well as from the on-site assessment and the interviews are summarised.

The summary of CAR, CL and FAR issued are shown in Table 4-1:

**Table 4-1:** Summary of CAR, CL and FAR

Verification topic	No. of CAR	No. of CL	No. of FAR
H - Project history	0	0	0
U - Update on Changes and Incidents	0	0	0
R - Monitoring Report – General	0	1	0
P - Monitoring Parameters	3	0	0
C - Emission Reduction Calculation	1	0	0
Q - Quality Management	1	0	0
<b>SUM</b>	<b>5</b>	<b>1</b>	<b>0</b>

The following tables include all raised CARs, CLs and FARs and the assessments of the same by the verification team. For an in depth evaluation of all verification items it should be referred to the verification protocols (see Annex).

Finding:	CAR P1		
Classification	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR

Finding:	CAR P1
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>In the registered PDD under metering equipment it is mentioned that the "the metering system for the project activity consists of one main meter and one check meter". But as per the data collected during the site visit there are two separate feeder line exclusively for the project activity, each feeder has separate main and check meter. Please clarify the same.</p>
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>We wish to clarify that any metering system refers to a set of main and check meters. As the DOE has rightly pointed out the project is connected through two feeder lines, each feeder line has its separate set of main and check meters. The description of the metering equipment and meter testing procedures provided in Annexure 4 of the PDD clearly mentions that the project has two main meters and two check meters.</p>
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>The explanation is only for project site metering, but there is another meter which is used for calculating the transmission losses (apportioning) approach and this is not in line with the PDD. Considering the explanation in the PDD net electricity supplied to the grid will be measured at the metering system i.e. before bulk meter reading. But considering the MR the bulk meter reading is also necessary to calculate the net electricity supplied to the grid because of calculating the transmission losses. This is a contradiction and it seems that revision of monitoring plan is necessary. Kindly clarify CAR P1 is open.</p>
<b>Corrective Action #2</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>As per the DOE comment PP has taken the revision in monitoring plan (web link: <a href="http://cdm.unfccc.int/filestorage/7/F/Z/7FZBDIM5QWXNSJ8LATO6R3UHC10Y9K/1259%201%20Revised%20Monitoring%20Plan.pdf?t=ZzF8MTMwMzEyMDUyNi4yMw== h0uM9-5S1Lz2h7u0SCK8emnnBI0=">http://cdm.unfccc.int/filestorage/7/F/Z/7FZBDIM5QWXNSJ8LATO6R3UHC10Y9K/1259%201%20Revised%20Monitoring%20Plan.pdf?t=ZzF8MTMwMzEyMDUyNi4yMw== h0uM9-5S1Lz2h7u0SCK8emnnBI0=</a>) We have revised the MR in line with the approved RMP and necessary corrections pertaining to Monitoring has been incorporated in revised MR.</p>
<b>DOE Assessment #2</b> <i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>Based on the data collected during the site visit<sup>/SV/</sup> and review of schematic metering diagram of the project activity<sup>/DIAG-PRO/</sup>, TÜV NORD confirms that there are two separate feeder line exclusively for this project activity. Each feeder line has a main and check meter. This metering arrangement has been called as project site metering. In addition to this metering there is a bulk metering which has a separate main and check meter. The two feeder lines of the project activity are connected to bulk meter which has other feeder lines of non project participants also connected to it. This bulk meter again has a main and a check meter for calculation of transmission loss by apportioning mechanism. All the information has been incorporated in the revised monitoring plan. Hence the project complies with the requirement of the approved revised monitoring plan<sup>/RevMP/</sup> and methodology. CAR P1 is closed.</p>



Finding:	CAR P1
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Finding:	CAR P2
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>Under point no 7.3 of Article 7 (Metering and communication) of the PPA, mentions that the monthly meter readings will be taken at the project site and the receiving substation for billing purpose, but in the registered PDD it is mentioned that the Net electricity delivered to the grid will be recorded by Joint Meter Reading (JMR) in the presence of Officials from off-taking Utility and Enercon (India) Ltd. Please explain in detail about the procedure for meter reading w.r.t the PPA and PDD.</p>
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>As mentioned in the PDD and the PPA (Article 7.3) the Net electricity supplied to the grid is recorded by taking a Joint Meter Reading (JMR) in the presence of Officials from off-taking Utility and Enercon India Ltd.</p> <p>Two joint meter readings are taken, one for the main and check meters located at the site and the other for the main and check meters located at the substation.</p> <p>Both JMRs are carried out in the presence of officials from Enercon and BESCOM, Form B of the respective JMRs carries the signatures of the respective officials. The date of JMR is also mentioned in the Form B. The date of JMR of the site main and check meters is the same as the JMR for the substation main and check meters for the corresponding month.</p> <p>Energy export and imports are calculated based on meter readings as of 00:00 hours on the first day of the following month. The metering equipment used for measuring energy export and import provide for time-stamping of meter-reading data thereby enabling the officials to record the readings of the project and substation meters, simultaneously.</p>
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>The response is not as per the monitoring plan set out in the registered PDD.</p> <p>CAR P2 is open.</p>



Finding:	CAR P2
<p><b>Corrective Action #2</b></p> <p><i>This section shall be filled by the PP. It shall address the corrective action taken in details</i></p>	<p>As mentioned in the PDD and the PPA (Article 7.3) the monthly meter readings (Joint Meter Reading) for both main and check meters at the Project site and the Receiving station are taken simultaneously and jointly in the presence of officials from Enercon and BESCOM on the first day of the following month. At 12 Noon.</p> <p>The recorded metering data is downloaded through meter recording instrument. The metering equipment used for measuring energy export and import provide for time-stamping of meter-reading data thereby enabling the officials to record the readings of the project and substation meters, simultaneously.</p> <p>At the conclusion of each meter reading an appointed representative of BESCOM and the Company sign a document indicating the number of units indicated by meter.</p> <p>Reading of energy export and imports of main meter at project site is mentioned in Form B. Net electricity supplied to grid by project activity is also mentioned in Form B, which is calculated after discounting transmission loss. The date of JMR is also mentioned in the Form B which carries the signatures of the respective officials. The date of JMR of the project site's main and check meters is the same as the JMR for the Receiving station's main and check meters for the corresponding month.</p>
<p><b>DOE Assessment #2</b></p> <p><i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i></p>	<p>The explanation provided is not mentioned in the registered monitoring plan. Need to go for revision of monitoring plan.</p> <p>CAR P2 is open.</p>
<p><b>Corrective Action #3</b></p> <p><i>This section shall be filled by the PP. It shall address the corrective action taken in details</i></p>	<p>As per the DOE comment PP has taken the revision in monitoring plan (web link: <a href="http://cdm.unfccc.int/filestorage/7/F/Z/7FZBDIM5QWXNSJ8LATO6R3UHC10Y9K/1259%201%20Revised%20Monitoring%20Plan.pdf?t=ZzF8MTMwMzEyMDUyNi4yMw== h0uM9-5S1Lz2h7u0SCK8emnnBI0=">http://cdm.unfccc.int/filestorage/7/F/Z/7FZBDIM5QWXNSJ8LATO6R3UHC10Y9K/1259%201%20Revised%20Monitoring%20Plan.pdf?t=ZzF8MTMwMzEyMDUyNi4yMw== h0uM9-5S1Lz2h7u0SCK8emnnBI0=</a>)</p> <p>We have revised the MR in line with the approved RMP and necessary corrections pertaining to Monitoring has been incorporated in revised MR.</p>

Finding:	CAR P2
<b>DOE Assessment #3</b> <i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>Based on the above response provided by the PP, review of Power purchase agreement<sup>/PPA/</sup>, data collected during the site visit<sup>/SV/</sup>, joint meter readings<sup>/JMR/</sup> and calibration details of the energy meters<sup>/CAL/</sup> it is agreed by the PP that the monitoring plan set out in the registered PDD need to go for revision. Thus the PP has submitted the revised monitoring plan to UNFCCC on 2010-11-18, which subsequently received clarification request on 2011-02-13 and got registered on 2011-03-15. Based on the response provided by the PP and the site visit interviews<sup>/IM01/&amp;/IM02/</sup>, TÜV NORD concludes that the procedure followed for meter readings are clearly explained in the revised monitoring plan. In addition, the JMRs for the current monitoring period have been verified and found to be in line with the explanation procedure set out in point no 7.3 of Article 7 (Metering and communication) of the PPA. The JMRs mentions the parameters like energy import, export and transmission losses for calculating net electricity supplied to the grid. The JMR was signed in the presence of state utility personnel's and representative of EIL. The invoices raised to the BESCO by the PP have been verified against the JMRs value for net electricity exported to the grid which was found to be OK. All the explanations are found to be included in the approved revised monitoring plan<sup>/RevMP/</sup>. CAR P2 is closed.</p>
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<div> <input type="checkbox"/> To be checked during the next periodic verification         </div> <div> <input checked="" type="checkbox"/> Appropriate action was taken         </div> <div> <input type="checkbox"/> Project documentation was corrected correspondingly         </div> <div> <input type="checkbox"/> Additional action should be taken         </div> <div> <input checked="" type="checkbox"/> The project complies with the requirements         </div>

Finding:	CAR P3
<b>Classification</b>	<div> <input checked="" type="checkbox"/> CAR         </div> <div> <input type="checkbox"/> CL         </div> <div> <input type="checkbox"/> FAR         </div>
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>The information on bulk meter installation and procedure for calculation of transmission losses are not mentioned in the PDD, but the same has been reflected in the signed PPA. Please clarify. In addition the PP is requested to explain the procedure for calculation of net electricity generation w.r.t registered PDD.</p>
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>We draw attention to the Monitoring Plan in the PDD, which clearly states that the procedure for metering and meter reading will be as per the provisions of the Provisions of Power Purchase Agreement. The PDD also states that the information provided in Annex 4 is only an illustration of such procedures.</p> <p>The installation of bulk meter as well as the procedure for apportioning the transmission losses to individual wind projects is spelt out in Article 6 of the PPA.</p> <p>Net electricity exports from the project are calculated by deducting</p>

Finding:	CAR P3
	<p>the transmission losses from the quantity of energy exports calculated from JMR records. It is important to note that the transmission loss and its allocation to different projects is determined by the DISCOM (Distribution Company) unilaterally on the basis of bulk meter readings. The bulk meter is owned and operated by the Discom and is beyond the purview of the project proponent.</p> <p>Since the project doesn't involve monitoring of transmission loss (the loss value is provided by DISCOM), the same has not been included in the Monitoring plan.</p> <p>The procedure for calculation of net electricity exports as defined in the PPA is set-out below:</p> <p><b>Calculation of Net Electricity Supplied to the grid:</b>  <math>EGy = EG_{\text{export}} - 115\% \cdot EG_{\text{import}} - \text{Transmission Loss (TE)}</math></p> <p>Please refer Section C of revised MR for the detailed calculations.</p>
<p><b>DOE Assessment #2</b>  <i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i></p>	<p>The explanation provided is not reflected in the registered PDD. Please revise the monitoring plan.  CAR P3 is open.</p>
<p><b>Corrective Action #2</b>  <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i></p>	<p>Monitoring Plan has been revised based on the approved RMP and MR has been revised accordingly to incorporate the procedure of apportioning.</p>
<p><b>DOE Assessment #1</b>  <i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i></p>	<p>As per section B.7.1, B.7.2 and Annex 4 of the revised approved monitoring plan, the transmission loss calculation and metering arrangements of bulk meter are clearly explained and in line of article 6 and article 7 of the PPA. There are two meter (one main and one check meter) for each feeder lines exclusively for the project activity other than bulk meter installation at the sub-station. Transmission loss is being calculated by state utility and applied in JMR while calculating the Net electricity exported by the project activity. The procedure mentioned by the project proponent in the response is verified against PPA and it is found be correct. As per the procedure, under Article 6 (Billing and Payment) the argument provided by the PP supports that transmission loss calculated at the sub- station by project site and bulk meter which is then factored into the JMR and given to the project proponent in the form of joint meter readings. The joint meter readings<sup>/JMR/</sup> for the monitoring period have been verified and found to contain the parameters "export", "import" , "transmission losses" and "net energy to be exported/billed.</p>

Finding:	CAR P3
	<p>For emission reduction calculation as prescribed in the revised monitoring plan the net electricity exported to grid as given in the joint meter cross verified with the invoice copy will be taken and used for emission reduction calculation. Please refer validation opinion for the revision of monitoring plan uploaded in UNFCCC website  <a href="http://cdm.unfccc.int/filestorage/U/1/4/U14HCQF3AZK7TW08L5BP GYXNVO62EI/1259%201%20Validation%20Opinion.pdf?t=dFB8MTMwMjg0ODE1MC431CzzN2slsL-44rHeCvE7ydlCLaM=">http://cdm.unfccc.int/filestorage/U/1/4/U14HCQF3AZK7TW08L5BP GYXNVO62EI/1259%201%20Validation%20Opinion.pdf?t=dFB8MTMwMjg0ODE1MC431CzzN2slsL-44rHeCvE7ydlCLaM=</a>) for detailed assessment.  CAR P3 is closed.</p>
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Finding:	CL R1
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>Please clarify on the following:</p> <ol style="list-style-type: none"> <li>1. PP name mentioned in MOC is Enercon (India) Limited but the same mentioned in MR is Enercon (India) Ltd. Please make it consistent.</li> <li>2. The expected and actual generation of electricity by the project activity should be related with months/years.</li> <li>3. The details of emission factor for the regional grid is not mentioned in the MR</li> <li>4. Emission reduction spread sheet need revision in format of date.</li> <li>5. The detail about calibration on meters in emission reduction spread sheet is not correct. The same is not included in the MR. please set right the anomaly.</li> </ol>
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<ol style="list-style-type: none"> <li>1. Correction has been made as DOE observation.</li> <li>2. The comparison of expected and actual generation has been added in section E5 of revised MR</li> <li>3. The detail of emission co-efficient or emission factor has been given in Section D and Annex 1 of revised MR with source of data used.</li> <li>4. Correction has been made in revised MR.</li> <li>5. Calibration details has been added in section C of MR and the soft copy of calibration certificates is attached with revised MR.</li> </ol>

Finding:	CL R1
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>The following changes has been implemented in the monitoring report and emission reduction spread sheet,</p> <ol style="list-style-type: none"> <li>1. The PP name is consistent throughout the submitted final version of the MR and in line with the MoC. As per the latest update the project has got one more party approved as authorized participants. It was verified from the following web link (<a href="http://cdm.unfccc.int/Projects/DB/DNV-CUK1185356859.49/view">http://cdm.unfccc.int/Projects/DB/DNV-CUK1185356859.49/view</a>). Also the authorised signatory also has been changed; it was verified and found to be OK.</li> <li>2. The clarification on expected generation has been rectified in the final version of the monitoring report by mentioning no of months.</li> <li>3. The detail about emission factor is now included in the final version of the monitoring report.</li> <li>4. The format mentioned in the final version of the emission reduction spread sheet is found to be correct.</li> <li>5. The date mentioned in the final version of the emission reduction spread sheet is now matching with the commission certificate submitted for verification.</li> </ol> <p>Hence all the changes has been verified and found to be OK CL R1 is closed successfully.</p>
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Finding:	CAR C1
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>The net electricity value mentioned in kWh of the MR and value mentioned in the spread sheet is not matching. Please clarify.</p>
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	<p>We agree with DOE's observation. The said mismatch was because of a typological error and the same has been rectified in the revised MR.</p>
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	<p>Typographical error in the monitoring report has been rectified and the corrections are verified in the final version of the monitoring report and found to be OK. CAR C1 is closed.</p>

Finding:	CAR C1
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input checked="" type="checkbox"/> Appropriate action was taken <input checked="" type="checkbox"/> Project documentation was corrected correspondingly <input type="checkbox"/> Additional action should be taken <input checked="" type="checkbox"/> The project complies with the requirements

Finding:	CAR Q1
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding</b> <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Please submit calibration/test certificate of the energy meters.
<b>Corrective Action #1</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The main and check meters tested and in case of error, are calibrated by the DISCOM. A letter from the DISCOM, stating that the meter testing/calibration has been carried out quarterly and the meters have been operating within their accuracy class, has been provided to the DOE.
<b>DOE Assessment #1</b> <i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Since the monitoring report starting date was 2008-10-27, please submit the test/calibration certificate for previous year for the consistency in the established practices and testing of the accuracy of monitoring equipment. CAR Q1 is open.
<b>Corrective Action #2</b> <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The latest test certificates pertaining to the main and check meters is submitted to the DOE. The certificates clearly show that both main and check meters are performing within their accuracy class. We refer to the Guidelines For Assessing Compliance With The Calibration Frequency Requirements – Annex 60 to EB 52, Paragraph 4(a) states that where calibration is not carried out in line with the frequency mentioned in the monitoring plan, as a conservative approach, the energy export and import values (as mentioned in the JMR) can be considered after applying the maximum possible value of error of the instrument to the measured values. Since the latest test certificate shows that meters are operating within their accuracy class, in accordance with Annex 60, EB 52 we have applied a correction factor of +0.2% for imports * transmission loss and -0.2% for exports for the entire monitoring period. The monitoring report has been revised accordingly.



Finding:	CAR Q1
<p><b>DOE Assessment #2</b></p> <p><i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i></p>	<p>The calibration certificates are available for the year 2008 and 2009<sup>/CAL/</sup> (please refer to section 7: Reference). As per the review of the calibration it was noted that the calibration frequency of once in a year as mentioned in the revised monitoring plan are not strictly practised. So while calculating the net electricity supplied by the project activity, the project proponent as a conservative approach while calculating the emission reduction has referred the latest "Guidelines for assessing compliance with the calibration frequency requirements". As per EB 52, Annex 60, point number 4(a) and 5, and applied the maximum permissible error of 0.2% to net electricity supplied (i.e., to Export, Import and transmission loss) as mentioned in the technical specification of the energy meter since the errors reported in the meters were well below 0.2% and said to be negligible. Hence the PP has chosen a conservative approach to calculate the emission reduction and applied the error percentage of 0.2% to export, import and transmission loss recorded values while calculating net electricity supplied to the grid. The procedure adopted by the PP is found to be acceptable and is in line with the UNFCCC guidance for calibration and the resulted emission reductions are more conservatively calculated and presented.</p> <p>CAR Q1 is closed.</p>
<p><b>Conclusion</b></p> <p><i>Tick the appropriate checkbox</i></p>	<p><input type="checkbox"/> To be checked during the next periodic verification</p> <p><input checked="" type="checkbox"/> Appropriate action was taken</p> <p><input checked="" type="checkbox"/> Project documentation was corrected correspondingly</p> <p><input type="checkbox"/> Additional action should be taken</p> <p><input checked="" type="checkbox"/> The project complies with the requirements</p>

## **5. SUMMARY OF VERIFICATION ASSESSMENTS**

The following paragraphs include the summary of the final verification assessments after all CARs and CLs are closed out. For details of the assessments pl. refer to the discussion of the verification findings in chapter 4 and the verification protocol (Annex 1).

### **5.1. Implementation of the project**

During the verification a site visit was carried out. On the basis of this site visit and the reviewed project documentation it can be confirmed that with respect to the realized technology, the project equipment has been implemented and operated as described in the registered PDD<sup>PDD/</sup>. The project activity involves the installation of 86 WEGs in Tumkur and Chitradurga districts of Karnataka, India. The total installed capacity of this wind power project is 68.8 MW and the expected Emission Reductions are 148,858 tCO<sub>2e</sub>/annum. The generated electricity is evacuated to the Southern Regional Grid. The monitoring of all Wind Energy Generators (WEGs) is done at the project site maintained and operated by M/s. Enercon (India) Ltd (hereafter referred to as O & M contractor). There are no major changes in the key equipment since the validation of the project. The project uses wind power to generate electricity to be supplied to the southern regional grid.

No CARs/CLs were raised.

### **5.2. Project history**

During the validation the validating DOE might have raised issues that could not be closed or resolved during the validation stage. For this purpose FARs might have been raised. No such issues were identified for this project.

All raised CARs and CLs were successfully closed during the validation of the project design. There are no remaining issues. The verification has been carried out based on the final registered PDD and CDM-UNFCCC Project registration.

Furthermore as this is the 1<sup>st</sup> periodic verification no issues from former verifications are to be considered.

No FAR was raised.

### **5.3. Special events**

Since the monitoring plan set out in the registered PDD was not in line the actual site monitoring conditions, a revision of monitoring plan has been sort out by the project



proponent after the verification site visit, which was subsequently validated and got approved from UNFCCC on 2011-03-15<sup>2</sup>. This was the only special events with effect on the monitoring of the project which was observed during the first monitoring period.

Based on CAR P1, CAR P2 and CAR P3 the monitoring plan was revised accordingly and approved.

## 5.4. Compliance with the monitoring plan

The monitoring system and all applied procedures are completely in compliance to the approved revised monitoring plan<sup>/RevMP/</sup>. For the following reason the monitoring plan set out in the registered PDD has been revised,

- In the registered PDD under metering equipment it is mentioned that "the metering system for the project activity consists of one main meter and one check meter". But as per the data collected during the site visit there are two separate feeder line exclusively for the project activity, each feeder has separate main and check meter. In addition the information on bulk meter installation and procedure for calculation of transmission losses have not mentioned in the PDD, but the same has been reflected in the signed PPA.
- The PP is requested to explain the procedure for calculation of net electricity generation w.r.t registered PDD.
- The calibration frequency is not mentioned in the registered PDD.

However CAR P1, CAR P2 and CAR P3 was raised during verification stage and subsequently closed after the approval of revised monitoring plan from UNFCCC.

## 5.5. Compliance with the monitoring methodology

The monitoring parameter of 'Net Electricity Supplied' by the Project activity is taken from the joint meter readings which is an authorized data provided by Bangalore Electricity Supply Corporation Limited (BESCOM)/Karnataka Power Transmission Corporation Limited (KPTCL) and is cross verified with invoice raised to BESCOM by the project proponent. The DOE also confirms that the mentioned monitoring plan is adequate and meets the requirements stipulated under monitoring methodology (ACM 0002 Version 06)<sup>3</sup>.

## 5.6. Monitoring parameters

During the verification all relevant monitoring parameters (as listed in chapter B.7.1 of the revised monitoring plan) have been verified with regard to the appropriateness of

<sup>2</sup> <http://cdm.unfccc.int/Projects/DB/DNV-CUK1185356859.49/view>

<sup>3</sup> [http://cdm.unfccc.int/UserManagement/FileStorage/CDMWF\\_AM\\_BW759ID58ST5YEEV6WUCN5744MN763](http://cdm.unfccc.int/UserManagement/FileStorage/CDMWF_AM_BW759ID58ST5YEEV6WUCN5744MN763)

the applied measurement / determination method, the correctness of the values applied for ER calculation, the accuracy, and applied QA/QC measures. The results as well as the verification procedure are described parameter-wise in the project specific verification checklist.

After appropriate corrections were carried out by the project participant it can be confirmed that all monitoring parameters have been measured / determined without material misstatements and in line with all applicable standards and relevant requirements.

The key monitoring parameters required to be monitored are the "*energy export, energy import, transmission loss and net energy supplied to the grid by the project activity*". The electricity supplied to the grid is measured by two-way tri-vector meter located at the project site and the substation. Thus the electricity generation of the project activity alone is considered for the reporting of emission reductions after deducting import and transmission losses. The joint meter reports was mentioned in B-Form and issued by the BESCOM. B-Form or Joint meter reading is the basis for raising the invoice by the project proponent to BESCOM.

Nevertheless, CAR P1, CAR P2 and CAR P3 were raised and successfully closed (Ref Annex: Verification Protocol – Table A-2).

## 5.7. Monitoring report

A draft monitoring report<sup>/MR2/</sup> was submitted to the verification team by the project participants. The team has made this report publicly available prior to the start of the verification activities. No comments were received.

During the verification, mistakes and needs for clarification were identified. The PP has carried out the requested corrections and made amendments to the monitoring plan and submitted to UNFCCC. Based on the approval from UNFCCC the final version of the Monitoring report<sup>/MR5/</sup> is complete and transparent and in accordance with the revised monitoring plan and other relevant requirements.

However CL R1 was raised and closed successfully.

## 5.8. ER Calculation

The net energy supplied to the grid is calculated as the difference between total energy exported, energy imported and transmission losses have been suitably subtracted. The correction factor of 0.2% in compliance with Annex 60, EB 52 has been applied and factored into the net electricity supplied for the entire monitoring period. Project emissions and leakage are deducted from this to arrive at net emission reductions.

The net electricity export to grid times an emission coefficient for the Southern Regional Grid of India was taken into account for the calculation of baseline emissions.

For the calculation of baseline emissions the ex-ante and validated value of baseline parameters, i.e., Southern Regional Grid Emission Factor<sup>/cea/</sup> is taken into account which is a validated and registered value.

The original monitoring data to calculate the emission reductions is taken from the joint meter readings<sup>/JMR/</sup> issued by BESCO. This data is the basis for the calculation of the emission reductions as given in the spreadsheet<sup>/XLS4/</sup>. Appropriate calculation methods (i.e. in accordance with ACM0002 Ver. 6) are applied. The grid emission factor of 0.93204 tCO<sub>2</sub>/MWh for the Southern Regional Grid of India has been rightly applied in this monitoring period.

### **Baseline Emissions:**

The formula used for the determination of baseline emissions which is consistent with the PDD is:

$$BE_y = EF_y \times EG_y$$

Where

EG<sub>y</sub> is the net electricity export to grid in a given year (KWh)

EF<sub>y</sub> is the emission factor for a given year (tonnes of CO<sub>2</sub>/MWh)

The baseline emissions (BE) during the monitoring period are **114,191 tCO<sub>2</sub>**.

### **Project Emission:**

Since the project is a wind power project, project emissions are nil.

### **Leakage Emission:**

Since the project is a wind power project, no leakage is considered.

### **Emission Reduction:**

Summary of Emission Reductions using above formula during the monitoring period:

Capacity (MW)	Year	Net Electricity Exported(in KWh)	Baseline Emissions* (tCO <sub>2</sub> e)	Project emissions	Emission Reductions (tCO <sub>2</sub> e)
68.8	2008-10-27 to 2009-11-30	122,526,108	114,191	0	114,191
	Total	122,526,108	114,191	0	114,191

\*Grid Emission Factor = of 0.93204 tCO<sub>2</sub>/MWh

Hence the total emission reductions are **114,191 tCO<sub>2</sub>**.

During the verification, some of the mistakes in the ER calculation were informed to the PP in the form of DVR and corrected. Corresponding CAR C1, CAR Q1 and CL R1 were raised and all raised issues were addressed appropriately so that all corresponding CARs/CLs were closed out. Thus it is confirmed that the ER calculation is transparent, conservative and correct. The supporting documents including the calibration reports<sup>/CAL/</sup> were verified and found to be OK.

## 5.9. Quality Management

The key monitoring parameters with influence on the calculation of the emission reductions are the energy export, energy import, transmission loss and net energy supplied to the BESCOM. The quantity of generated power is measured with accuracy and class 0.2 power meters which are duly calibrated with some delays.

The meter readings are carried out once in a month by BESCOM. The BESCOM/KPTCL will provide the B-Form/joint meter readings which forms the basis for the commercial billing. All relevant evidences such as training records, training procedures<sup>/TRA/</sup> were fully checked by the verification team during the on-site visit. All evidences are clearly identifiable and assessed to be correct.

The monitoring personnel are from service provider (M/s. Enercon (India) Ltd). They are well trained and follow reproducible routines<sup>/IM01&IM02/</sup>.

All necessary monitored and measured raw data were checked during on-site verification. Enercon (India) Ltd has the responsibility to supervise and monitor the parameters and emission reduction calculations.

The calibration of meters has been done by state utility<sup>/CAL/</sup>. Please refer above section for **Table 2-5 (b) (i), (ii) and (iii)** for detailed calibration date of energy meters.

Calibration certificates issued by state utility after carrying out the calibration were verified and were found in order.

All monitored data are archived in physical and electronic form. The data will be kept for the whole crediting period and additional 2 years as given in the PDD.

Quality Management procedures for measurements, collection and compilation of data, data storage and archiving, calibration, maintenance and training of personnel in the framework of this CDM project activity have been defined. The procedures defined can be assessed as appropriate for the purpose. No significant deviations thereof have been observed during the verification.

In this respect, CAR Q1 was raised and successfully closed.

## **5.10. Overall Aspects of the Verification**

All necessary and requested documentation was provided by the project participants so that a complete verification of all relevant issues could be carried out.

Access was granted to all installations of the plant which are relevant for the project performance and the monitoring activities.

No issues have been identified indicating that the implementation of the project activity and the steps to claim emission reductions are not compliant with the UNFCCC criteria and relevant guidance provided by the COP/CMP and the CDM EB (clarifications and/or guidance).

## **5.11. Hints for next periodic Verification**

Not Applicable

## 6. VERIFICATION OPINION

M/s. Enercon (India) Ltd has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 1<sup>st</sup> periodic verification of the project: "Enercon Wind Farm (Hindustan) Ltd in Karnataka", with regard to the relevant requirements for CDM project activities. The project reduces GHG emissions due to the generation of electricity from wind energy. The project activity consists of 86 WEGs and each machine capacity is of 800 kW totaling to the capacity of 68.8 MW generating electricity to be supplied to the Southern Regional Grid. This verification covers the period from 2008-10-27 to 2009-11-30 (including both days).

In the course of the verification 5 Corrective Action Requests (CAR) and one Clarification Requests (CL) were raised and successfully closed. Furthermore no FAR was raised to improve the monitoring system in the future. The verification is based on the draft monitoring report, revised monitoring report, the monitoring plan as set out in the registered PDD, the validation report, emission reduction calculation spreadsheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

As a result of this verification, the verifier confirms that:

- All operations of the project are implemented and installed as planned and described in the validated project design document.
- The monitoring plan is in accordance with the applied approved CDM methodology ,i.e., ACM0002 Ver 6.0.
- The installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately with some delays.
- The monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of the 1<sup>st</sup> periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Emission reductions: **114,191**

t CO<sub>2e</sub>

Bangalore, 2011-07-16

Essen, 2011-07-16



Ma. Paa. Puratchikkanal

Rainer Winter

TÜV NORD JI/CDM Certification  
Program

TÜV NORD JI/CDM Certification Program

Senior Assessor

Verification Team Leader

## 7. REFERENCES

**Table 7-1:** Documents provided by the project participant(s)

Reference	Document
<b>/CR/</b>	<ul style="list-style-type: none"> <li>Commissioning certificate issued by KPTCL for 56 WEGs dated 2006-09-29</li> <li>Commissioning certificate issued by KPTCL for 9 WEGs dated 2006-10-26</li> <li>Commissioning certificate issued by KPTCL for 15 WEGs dated 2006-12-28</li> <li>Commissioning certificate issued by KPTCL for 6 WEGs dated 2006-12-28</li> </ul>
<b>/CAL/</b>	<ul style="list-style-type: none"> <li>Calibration certificate for KBCWP-01 bulk meter (Both main and check meter) issued by KPTCL dated 2008-02-06, 2009-06-17, 2009-09-29 and 2009-12-30</li> <li>Calibration certificate for KBCWP-02 project site meter (Both main and check meter) for 56.8MW issued by KPTCL/BESCOM dated 2008-01-02 and, 2009-12-14 and meter change report dated 2008-06-02 for the check meter.</li> <li>Calibration certificate for KBCWP-03 project site meter (Both main and check meter) for 12.0 MW issued by KPTCL/BESCOM dated 2008-02-06 and 2010-04-16</li> </ul>
<b>/DIAG-PRO/</b>	Schematic diagram of the metering of the project activity
<b>/INV/</b>	Invoice raised for the energy generated by the WEGs of the project activity for the month of November 2008 to November 2009.
<b>/JMR/</b>	B forms/Joint meter readings issued by BESCOM for the energy generation by project activity for the month of November 2008 to November 2009.
<b>/MR2/</b> <b>/MR3/</b> <b>/MR4/</b> <b>/MR5/</b>	<p>Initial webhosted draft monitoring report w.r.t "Enercon Wind Farm (Hindustan) Ltd in Karnataka" version 02, dated 2009-12-30</p> <p>Monitoring report w.r.t "Enercon Wind Farm (Hindustan) Ltd in Karnataka" version 03, dated 2010-08-30</p> <p>Monitoring report w.r.t "Enercon Wind Farm (Hindustan) Ltd in Karnataka" version 04, dated 2011-04-11</p> <p>Final Monitoring report w.r.t "Enercon Wind Farm (Hindustan) Ltd in Karnataka" version 05, dated 2011-07-01</p>
<b>/ORG/</b>	Organization Chart and responsibilities



Reference	Document
/O&M/	Operation and maintenance by M/s. Enercon India Ltd, an ISO 9001 certified company.
/PPA/	Power purchase agreement for 68.8 MW capacity dated 2006-03-01
/SV/	Data collected during site visit w.r.t, project implementation, metering arrangements, metering equipments, monitoring personnel's, outages, internal audit and management review report, data archiving etc.
/TD/	Technical details of the WTGs of E-48-800kW model
/TRA/	Training records, attendance and certificate conducted for the site personnel's.
/XLS1/ /XLS2/ /XLS3/ /XLS4/	<ul style="list-style-type: none"> <li>Emission reduction calculation spread sheet w.r.t version 02 of the MR</li> <li>Emission reduction calculation spread sheet w.r.t version 03 of the MR</li> <li>Emission reduction calculation spread sheet w.r.t version 04 of the MR</li> <li>Emission reduction calculation spread sheet w.r.t version 05 of the MR</li> </ul>

**Table 7-2:** Background investigation and assessment documents

Reference	Document
/ACM0002/	Consolidated methodology for grid-connected electricity generation from renewable sources, version 06
/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/IPPC/	<ol style="list-style-type: none"> <li>1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book</li> <li>2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book</li> </ol>
/KP/	Kyoto Protocol (1997)
/MA/	Decision 3/CMP. 1 (Marrakesh – Accords)
/PDD/	Project Design Document for CDM project: "Enercon Wind Farm (Hindustan) Ltd in Karnataka" version 5, dated 2008-10-01



Reference	Document
/RevMP/	Approved revised monitoring plan w.r.t "Enercon Wind Farm (Hindustan) Ltd in Karnataka" dated 2011-03-15
/VAL/	Validation Report for CDM project : "Enercon Wind Farm (Hindustan) Ltd in Karnataka" version 3, dated 2008-10-24
/VVM/	UNFCCC Validation and Verification Manual (Version as per EB 55)
/EB52-A60/	Guidelines for assessing compliance with the calibration frequency requirements

**Table 7-3:** Websites used

Reference	Link	Organisation
/cea/	<a href="http://www.cea.nic.in/">http://www.cea.nic.in/</a>	Central Electricity Authority
/dna-HP/	<a href="http://cdmindia.nic.in/#">http://cdmindia.nic.in/#</a>	DNA of India, MoEF
/unfccc/	<a href="http://cdm.unfccc.int">http://cdm.unfccc.int</a>	UNFCCC
/ipcc/	<a href="http://www.ipcc-nggip.iges.or.jp">www.ipcc-nggip.iges.or.jp</a>	IPCC publications

**Table 7-4:** List of interviewed persons

Reference	Mol <sup>1</sup>		Name	Organisation / Function
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	H. Manjunath	DGM, Enercon (India) Ltd, O & M Service providers
/IM02/	V	<input type="checkbox"/> Mr. <input checked="" type="checkbox"/> Ms.	Saujanya Kumar	Consultant, Enercon (India) Ltd

<sup>1)</sup> Means of Interview: (Telephone, E-Mail, Visit)

# ANNEX

- A1:** Verification Protocol
- A2:** Appointment / Authorisation statements

## ANNEX 1: VERIFICATION PROTOCOL

**Table A-1:** GHG calculation procedures and management control testing / detailed audit testing of residual risk areas and random testing

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including <i>Forward Action Requests</i> )
<b>Raw data generation</b>				
<ul style="list-style-type: none"> <li>• Installation of measuring equipment</li> <li>• Dysfunction of installed equipment</li> <li>• Mal-operation by operational personnel</li> <li>• Downtimes of equipment</li> <li>• Exchange of equipment</li> <li>• Change of measurement equipment characteristic</li> <li>• Insufficient accuracy</li> <li>• Change of</li> </ul>	<ul style="list-style-type: none"> <li>• Installation of modern and state of the art equipment</li> <li>• Process control automation</li> <li>• Internal data review</li> <li>• Regular visual inspections of installed equipment</li> <li>• Only skilled and trained personnel operates the relevant equipment</li> <li>• Daily raw data checks</li> <li>• Immediate exchange of dysfunctional equipment</li> </ul>	<ul style="list-style-type: none"> <li>• Inadequate installation / operation of the monitoring equipment</li> <li>• Inadequate exchange of equipment</li> <li>• Change of personnel</li> <li>• Undetected measurement errors</li> <li>• Inappropriateness of Management system procedures w.r.t. monitoring plan requirements (e.g. substitute value strategies)</li> <li>• Non-application of management system procedures</li> </ul>	<ul style="list-style-type: none"> <li>• Site – visit (maintenance dept., gas supplier)</li> <li>• Check of equipment</li> <li>• Check of technical data sheets</li> <li>• Check of suppliers information / guarantees</li> <li>• Check of calibration records, if applicable</li> <li>• Check of maintenance records</li> <li>• Counter-check of raw data and commercial data</li> <li>• Check of CDM management system</li> </ul>	<ul style="list-style-type: none"> <li>• <b>See Table A-2</b></li> </ul>

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including <i>Forward Action Requests</i> )
<ul style="list-style-type: none"> <li>technology</li> <li>Accuracy of values supplied by Third Parties</li> </ul>	<ul style="list-style-type: none"> <li>Stand-by duty is organized</li> <li>Training</li> <li>Internal audit procedures</li> <li>Internal check of QA/QC measures of involved Third Parties</li> </ul>	<ul style="list-style-type: none"> <li>Insufficient accuracy</li> <li>Inappropriate QA/QC measures of Third Parties</li> </ul>	<ul style="list-style-type: none"> <li>Check of CDM related procedures</li> <li>Application of CDM management system procedures</li> <li>Check of trainings</li> <li>Check of responsibilities</li> <li>Check of QA/QC documentation / evidences of involved Third Parties</li> </ul>	
<b>Raw data collection and data aggregation</b>				
<ul style="list-style-type: none"> <li>Wrong data transfer from raw data to daily and monthly aggregated reporting forms</li> <li>IT Systems</li> <li>Spread sheet programming</li> <li>Manual data transmission</li> </ul>	<ul style="list-style-type: none"> <li>Cross-check of data</li> <li>Plausibility checks of various parameters.</li> <li>Appropriate archiving system</li> <li>Clear allocation of responsibilities</li> <li>Application of CDM Management system procedures</li> </ul>	<ul style="list-style-type: none"> <li>Unintended usage of old data that has been revised</li> <li>Incomplete documentation</li> <li>Ex-post corrections of records</li> <li>Ambiguous sources of information</li> <li>Non-application of management system procedures</li> </ul>	<ul style="list-style-type: none"> <li>Check of data aggregation steps</li> <li>Counter-calculation</li> <li>Data integrity checks by means of graphical data analysis and calculation of specific performance figures</li> <li>Check of management system certification</li> </ul>	<ul style="list-style-type: none"> <li><b>See Table A-2</b></li> </ul>

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including <i>Forward Action Requests</i> )
<ul style="list-style-type: none"> <li>Data protection</li> <li>Responsibilities</li> </ul>	<ul style="list-style-type: none"> <li>Usage of standard software solutions (Spreadsheets)</li> <li>Limited access to IT systems</li> <li>Data protection procedures</li> </ul>	<ul style="list-style-type: none"> <li>Manual data transfer mistakes</li> <li>Unintended change of spread sheet programming or data base entries</li> <li>Problems caused by updating/upgrading or change of applied software</li> </ul>	<ul style="list-style-type: none"> <li>Check of data archiving system</li> <li>Check of application of Management system procedures</li> </ul>	
<b>Other calculation parameters</b>				
<ul style="list-style-type: none"> <li>Emission factors, oxidation factors, coefficients</li> </ul>	<ul style="list-style-type: none"> <li>The values and data sources applied are defined in the PDD and monitoring plan</li> </ul>	<ul style="list-style-type: none"> <li>Unintended or intended Modification of calculation parameters</li> <li>Wrong application of values</li> <li>Misinterpretations of the applied methodology and/ or the PDD</li> <li>Missing update of applicable regulatory framework (e.g. IPCC values)</li> </ul>	<ul style="list-style-type: none"> <li>Update-check of regulatory framework</li> <li>Countercheck of the applied MP in the MR against the methodology and the PDD</li> </ul>	<ul style="list-style-type: none"> <li><b>See Table A-2</b></li> </ul>
<b>Calculation Methods</b>				

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including <i>Forward Action Requests</i> )
<ul style="list-style-type: none"> <li>Applied formulae</li> <li>Miscalculation</li> <li>Mistakes in spread-sheet calculation</li> </ul>	<ul style="list-style-type: none"> <li>Advanced calculation and reporting tools</li> <li>A CDM coordinator is in charge of the CDM related calculations</li> <li>Usage of tested / counterchecked Excel spreadsheets</li> <li>Involvement of external consultants</li> </ul>	<ul style="list-style-type: none"> <li>The danger of miscalculation can only be minimized.</li> </ul>	<ul style="list-style-type: none"> <li>Countercheck on the basis of own calculation.</li> <li>Spread sheet walk-through.</li> <li>Plausibility checks</li> <li>Check of plots</li> </ul>	<ul style="list-style-type: none"> <li><b>See Table A-2</b></li> </ul>
<b>Monitoring reporting</b>				
<ul style="list-style-type: none"> <li>Data transfer to the author of the monitoring report</li> <li>Data transfer to the monitoring report</li> <li>Unintended use of outdated versions</li> </ul>	<ul style="list-style-type: none"> <li>An experienced CDM consultant is responsible for monitoring reporting.</li> <li>CDM QMS procedures are defined</li> </ul>	<ul style="list-style-type: none"> <li>The danger of data transfer mistakes can only be minimized</li> <li>Inappropriate application of QMS procedures</li> </ul>	<ul style="list-style-type: none"> <li>Counter check with evidences provided.</li> <li>Audit of procedure application</li> </ul>	<ul style="list-style-type: none"> <li><b>See Table A-2</b></li> </ul>

**Table A-2:** (Project specific) Periodic Verification Checklist

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<b>1. Project history</b>				
<b>1.1 Open issues from validation</b> <b>(EB 55 Annex 1, §§ 181-183, 188c, 190c)</b> <i>Check (esp. in case of 1<sup>st</sup> periodic verification) whether there are any open issues indicated in the validation report (e.g. FAR)?</i>	/PDD/ /VAL/ /unfccc/	<p><i>Description:</i></p> <p>All raised CARs and CLs were successfully closed during the validation of the project design. There are no remaining issues indicated in the validation report. The monitoring plan was revised prior to verification. The same has been described in section 5.4 of this report. The verification has been carried out based on the approved revised MP.</p> <p><i>Justification of evidences:</i></p> <p>The following website can be referred for the checklist item 1.1,  <a href="http://cdm.unfccc.int/Projects/DB/DNV-CUK1185356859.49/view">http://cdm.unfccc.int/Projects/DB/DNV-CUK1185356859.49/view</a>  <a href="http://cdm.unfccc.int/UserManagement/FileStorage/4N3W9XGUHAIZYL0CJDFQRV6S17K5ET">http://cdm.unfccc.int/UserManagement/FileStorage/4N3W9XGUHAIZYL0CJDFQRV6S17K5ET</a>  <a href="http://cdm.unfccc.int/UserManagement/FileStorage/UQGIPOLMDHT49R67YAC25JEV03WFXS">http://cdm.unfccc.int/UserManagement/FileStorage/UQGIPOLMDHT49R67YAC25JEV03WFXS</a></p> <p><i>Conclusion:</i></p> <p>There are no open issues, including FARs from validation. The verification has been carried out based on the registered PDD final validation report and revised approved monitoring plan. A total of 5 CARs and one CL were raised and successfully closed out during this verification and meets the requirements as per 181-183, 188, 190c of VVM.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<b>1.2 Open issues from previous verification (EB 55 Annex 1, § 193)</b>  <i>Check in case of further periodic verifications whether there are any open issues indicated in previous verification reports (FAR) and take into consideration the guidance as specified in VVM.</i>	/unfccc/	<p>This is the first periodic verification of the project activity, hence not applicable.</p> <p>Please refer to 1.1</p>	OK	OK
<b>1.3 Requests for Deviations / Revisions of MP (EB 55 Annex 1, §§ 201, 203, 212, 219)</b>  <i>Check if there have been any requests for deviations from the registered monitoring plan or requests for revisions of the monitoring plan. If any, make sure that the monitoring report reflects the application of the approved guidance from the CDM EB regarding the Rfdev. and that those issues are subject to verification?</i>	/PDD/ /VAL/ /RevMP/ /unfccc/	<p><i>Description:</i></p> <p>As per VVM § 201, the monitoring plan was revised to reflect actual practices of monitoring and recording of electricity generated at the project site to improve the completeness and accuracy, which was before the conclusion of verification and certificate decision. In addition the calibration frequency was clearly mentioned in the revised monitoring plan. As per EB 49, Annex 28 the project was submitted to UNFCCC and got approved.</p> <p><i>Justification of evidences:</i></p> <p>The monitoring plan in the monitoring reports<sup>/MR5/</sup> is in line with that of the approved revised monitoring plan<sup>/RevMP/</sup> and approved methodology</p> <p><a href="http://cdm.unfccc.int/filestorage/7/F/Z/7FZBDIM5QWXNSJ8LAT06R3UHC10Y9K/1259%201%20Revised%20Monitoring%20Plan.pdf?t=OHF8MTMwNDQ5MDMxMy4xMQ==jnXhqeVVzXu8Vd0hC-4aEQg74eOs=">http://cdm.unfccc.int/filestorage/7/F/Z/7FZBDIM5QWXNSJ8LAT06R3UHC10Y9K/1259%201%20Revised%20Monitoring%20Plan.pdf?t=OHF8MTMwNDQ5MDMxMy4xMQ==jnXhqeVVzXu8Vd0hC-4aEQg74eOs=</a></p> <p><i>Conclusion:</i></p> <p>The approved revised monitoring plan is in line with the applicable methodology ACM 0002, Version 06. The reported</p>	<del>/CAR P1/</del> <del>/CAR P2/</del> <del>/CAR P3/</del>	OK



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>emission reductions are in line with the approved revised monitoring plan. The revised MP reflects the best and accurate monitoring of electricity generated by the project activity. The verification team confirms that the revised monitoring plan reflects the actual site conditions and no deviation have been applied for this project activity. The verification report follows the requirements of VVM §§ 201, 203, 212, 219.</p> <p>CAR P1, CAR P2 and CAR P3 were raised and closed successfully.</p>		
<p><b>1.4 Initial verification</b></p> <p><i>In case an initial verification has been carried out, check if all FARs, recommendations etc. have been addressed appropriately.</i></p>	/unfccc/	No initial verification has been carried out. This is the first periodic verification.	OK	OK
<p><b>1.5 Initial project implementation</b> <b>(EB 55 Annex 1, §§ 182, 195-201)</b></p> <p><i>In case of first periodic verification: Assess whether the project has been implemented and operated as per the registered PDD and are all physical features of the project in place? Further focus on the potential phase wise implementation and report on the corresponding statuses and starting dates accordingly.</i></p> <p><i>Also, discuss – if applicable – any approvals of the necessary request of notification or request for approval of changes from the project activity as described in the registered PDD (EB 48 Annex 66/67).</i></p>	<p>/IM01/ /IM02/ /MR/ /PDD/ /ACM000 2/ /SV/ /TD/ /JMR/</p>	<p><i>Description:</i></p> <p>By means of review of PDD, documents and the data collected during the site visit, the project has been implemented as described in the registered PDD. The project installs 86 WEGs of E-48 model (800 kW) of Enercon wind turbines in the districts of Tumkur and Chitradurga of Karnataka. All the equipments, capacity and details mentioned regarding the project activity is as per the registered PDD. The last date of commission of the WEGs belong to the project activity was 2006-12-28. The project generated electricity and supplies it to BESCO (State utility). The monitoring plan has been revised to be in line with the actual site condition and approved as per the monitoring methodology requirements.</p> <p><i>Justification of evidences:</i></p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>In case of further periodic verifications: Go to next chapter.</i>		<p>The site visit interview was conducted on 2010-02-25 and 2010-02-26. The verification team confirms all the physical features of the project were in place and as stated in the registered PDD<sup>/PDD/</sup> and revised monitoring plan<sup>/RevMP/</sup>.</p> <p><i>Conclusion:</i></p> <p>It was confirmed by reviewing the commissioning certificate<sup>/CR/</sup> and actual data collected during the site visit<sup>/SV/</sup>, that the project has been implemented and operated as per the registered PDD. Based on the commissioning certificate<sup>/CR/</sup> it is confirmed that all the 86 WEGS of 800kW with a total capacity of 68.8 MW has been commissioned and started delivering the energy to the southern regional grid before the crediting period start date. There was no need for notification of changes from the project activity as described in the registered PDD. Hence the VVM §§ 182, 195-201 requirements are assessed with evidences.</p>		
<b>2. Update on Changes and Incidents (during the Monitoring Period)</b>				
<b>2.1 Technical equipment</b> <b>(EB 55 Annex 1, § 187)</b> <i>Check if relevant technical equipment of the project activity has been exchanged or modified during the monitoring period. Further ensure that consistent designations of key equipment (meters etc.) in PDD, MR and calculation spreadsheet are applied</i> <i>Consider e.g. interviews with operational personnel, QMS records, maintenance records, instrument</i>	/IM01/ /TD/ /CAL/ /CR/ /MR5/ /SV/	<p><i>Description:</i></p> <p>By means of equipment technical specifications and during the audit it was evidenced that no relevant equipment was changed or modified within the monitoring period (i.e., from the start date till the end date of the first periodic verification). The total capacity of the project activity remains 68.8 MW with two feeder line exclusively for the project which has a main meter and check meter for each feeder line and bulk meter system at substation. From the date of commissioning there was no change in the accuracy class of installed energy meters.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>specifications.</i></p> <p><i>In case of changes, check whether the project is still in line with the registered PDD and assure that these changes have been considered in the monitoring report and the emission reduction calculation.</i></p> <p><i>Also, discuss –if applicable- any approvals of the necessary request of notification or request for approval of changes from the project activity as described in the registered PDD (EB 48 Annex 66/67).</i></p>		<p><i>Justification of evidences:</i></p> <p>By means of interviews with the operational personnel it was confirmed that no relevant operation modes were changed or modified within the monitoring period.</p> <p><i>Conclusion:</i></p> <p>There have been no special occurrences/incidents or changes to the project design and implementation during the monitoring period. No relevant equipment was changed or modified during the monitoring period. All supporting documents, such as the commissioning certificates<sup>/CR/</sup>, calibration reports<sup>/CAL/</sup> and technical particulars<sup>/TD/</sup> were found to be in agreement with the description mentioned for the project in the project design documents.</p> <p>All energy meters and their details including the make, accuracy class and serial numbers have been correctly mentioned in the MR<sup>/MR5/</sup>. The same has been confirmed during the site visit<sup>/SV/</sup> and documentary verification such as joint meter readings and calibration certificates. Thus the approved revised monitoring plan is in line with the applied methodology of ACM 0002 version 6 and satisfies VVM , § 187.</p>		
<p><b>2.2 Operation modes</b></p> <p><b>(EB 55 Annex 1, § 195)</b></p> <p><i>Check if relevant operation modes of the project activity have been exchanged or modified during the monitoring period.</i></p> <p><i>Consider e.g. interviews with operational personnel, operation log sheets, data management system</i></p>	<p>/IM01/ /SV/ /ORG/</p>	<p><i>Description:</i></p> <p>By means of interviews with the operational personnel it was evidenced that no relevant operation modes were changed within the monitoring period. The equipment has been installed as described in the PDD and there has been no change or modification of the equipment before or during the monitoring period. The monitoring plan has been revised and approved which was uploaded in UNFCCC website.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>records.</i></p> <p><i>In case of changes, check whether the project is still in line with the registered PDD and assure that these changes have been considered in the monitoring report and the emission reduction calculation.</i></p> <p><i>Also, discuss – if applicable – any approvals of the necessary request of notification or request for approval of changes from the project activity as described in the registered PDD (EB 48 Annex 66/67).</i></p>		<p><i>Justification of evidences:</i></p> <p>Operational modes and project description was confirmed during the interview with the monitoring personnel's and representative from project proponent during the site.</p> <p><i>Conclusion:</i></p> <p>No change or modification of relevant metering equipment and operation mode was identified during first monitoring period. All supporting documents, such as the certificate of approval from the electricity board<sup>/CR/</sup>, operation mode, calibration reports<sup>/CAL/</sup> and technical particulars<sup>/TD/</sup> were found to be in agreement with the metering equipment verified during the site visit. The approved revised monitoring is in line with the applicable methodology ACM 0002, Version 06 which mentions monitoring of Net power export to the grid. The reported emission reductions are also in line with the approved revised monitoring plan. The revised monitoring reflects the best and accurate monitoring of electricity generated by the project activity.</p>		
<p><b>2.3 Incidents</b></p> <p><b>(EB 55 Annex 1, § 187, 208a)</b></p> <p><i>Identify if there have been any significant incidents, deviant operation modes and / or downtimes of the equipment?</i></p> <p><i>Consider e.g. interviews with operational personnel, operational log sheets, analysis of performance data.</i></p>	/IM01/	<p><i>Description:</i></p> <p>It was verified during the site visit that no significant incidents have occurred during the monitoring period. This was also backed up by the data integrity check. Minimal downtime of equipment and energy generation was identified and presented in the revised monitoring report<sup>/MRS/</sup>. A complete set of data for the monitored parameters are available and submitted to the DOE. There was a lack of authorised data from state utility for 5 days. It was because since every joint meter readings will be starting from 1<sup>st</sup> of every month, to make the emission reduction</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>calculation simple the first 5 day energy generation calculation was not included for emission reduction (i.e., from 27<sup>th</sup> to 31<sup>st</sup> October 2008) because it is difficult to arrive the few days generation as per the registered monitoring plan. BESCO will not give separate JMR for 5 day generation for the project activity. Thus the actual generation data are taken from 2008-11-01 onwards which ultimately results in lower emission reductions.</p> <p><i>Justification of evidences:</i></p> <p>This was confirmed during document review of the monthly joint meter readings<sup>/JMR/</sup>, invoices<sup>/INV/</sup>, calibration reports<sup>/CAL/</sup>.</p> <p><i>Conclusion:</i></p> <p>No significant incidents have occurred during the monitoring period w.r.t the operation modes, downtimes in equipment etc. All these have been confirmed based on the evidence and interview with the site personnel's.</p>		
<p><b>2.4 Personnel</b></p> <p><i>Identify, if relevant personnel w.r.t. monitoring has been exchanged?</i></p> <p><i>In case of changes, assure that the implemented monitoring procedures have not been affected.</i></p>	<p>/IM01/ /ORG/</p>	<p><i>Description:</i></p> <p>The persons in charge of the monitoring and maintenance of the WEGs and monitoring equipment and central monitoring system of M/s. Enercon (India) Ltd have not been changed during the monitoring period. The authorised signatory person has been changed recently and one more project participant is also added and the MOC was submitted to UNFCCC and valid as on 2010-08-05. The revised authorised signatory form also has been changed from Mr. Raghanvan to Mr. Yogesh Mehra.</p> <p><i>Justification of evidences:</i></p> <p>By means of interviews with the operational personnel and</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		review of organisation chart <sup>/ORG/</sup> . <i>Conclusion:</i> Other than authorised signatory, the persons responsible for monitoring of the project activity have remained the same during the monitoring period. Hence, the operating modes have not been altered during the monitoring period.		
<b>2.5 Legislation</b> Find out whether relevant legislation with effect on the project activity in the host country has been changed. In any case data source shall be referenced.	/IM01/ /PPA/ /dna/	<i>Description:</i> Relevant legislation was considered, No relevant changes since the validation were identified. <i>Justification of evidences:</i> The PPA <sup>/PPA/</sup> remains the same as that signed during validation. The verification team reviewed host country DNA website. <i>Conclusion:</i> No relevant changes since validation were identified.	OK	OK
<b>3. Monitoring Report – General</b>				
<b>3.1 Monitoring period</b> <i>Check if the monitoring period is in line with a) the crediting period and/or b) previous monitoring periods?</i>	/unfccc/ /PDD/ /MR5/	<i>Description:</i> This is the first periodic verification. The monitoring period lasts from 2008-10-27 to 2009-11-30 (both days are included.) Thus it is in line with the registration date of the project activity with UNFCCC. <i>Justification of evidences:</i> The information's are verified from UNFCCC database maintained for project reference 1259. <i>Conclusion:</i>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		The monitoring period lasts from 2008-10-27 to 2009-11-30 both days are included. The first day of the monitoring period is the date of registration of the project activity, which is in this case the start of the crediting period.		
<b>3.2 Publication of the Monitoring Report</b> <i>Check if the monitoring report has been made publicly available on the UNFCCC website before the verification commenced.</i>	/unfccc/ /MR2/	<i>Description:</i> The monitoring report was made available publicly for global stakeholder comments on the 2010-02-08 in UNFCCC website. <i>Justification of evidences:</i> The following web link can be referred for checklist item 3.2, <a href="http://cdm.unfccc.int/Projects/DB/DNV-CUK1185356859.49/iProcess/RWTUV1265623587.94/view">http://cdm.unfccc.int/Projects/DB/DNV-CUK1185356859.49/iProcess/RWTUV1265623587.94/view</a> <i>Conclusion:</i> The draft monitoring report <sup>MR2/</sup> , as received from the project participants, has been made publicly available prior to the start of the verification activities. No comments have been received.	OK	OK
<b>3.3 References</b> <i>Check if the monitoring report provides the correct references, in detail: project title, UNFCCC registration No., applied methodology/ies, meth tools.</i>	/MR5/ /unfccc/	<i>Description:</i> The monitoring report provides the correct title, UNFCCC reference number and methodology. <i>Justification of evidences:</i> The following web link can be referred for checklist item 3.3, <a href="http://cdm.unfccc.int/Projects/DB/DNV-CUK1185356859.49/view">http://cdm.unfccc.int/Projects/DB/DNV-CUK1185356859.49/view</a> <i>Conclusion:</i> All references are given in the monitoring report. All references are correct.	OK	OK



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<b>3.4 Completeness</b> <b>(EB 55 Annex 1, §§ 182, 195, 202, 206)</b> <i>Assess if the monitoring report is complete, i.e. have all relevant issues been addressed? The MR shall include: (i) The implementation status of the project during the monitoring period (ii) Monitoring systems and procedures incl. QA/QC system employed (iii) all parameters to be monitored and reported at the intervals required by the MP and the Meth (iv) information on calibration of monitoring instruments (v) Emission factors, IPCC default values etc. (vi) reference to any deviation request approved by the EB, (vii) calculation of ER including reference to formulae and methods used (viii) comparison of the actual ER claimed in the MP with the estimate in the registered PDD and explanation in case of significant increase.</i>	/MR5/ /PDD/ /XLS4/ /ACM000 2/ /SV/ /RevMP/	Yes all relevant issues are covered; in detail: <input checked="" type="checkbox"/> (i) Implementation status <input checked="" type="checkbox"/> (ii) Monitoring systems and procedures (esp. QA/QC) <input checked="" type="checkbox"/> (iii) All parameters and corresponding intervals <input checked="" type="checkbox"/> (iv) Information on calibration of monitoring instruments <input checked="" type="checkbox"/> (v) Emission factors, IPCC default values etc. <input type="checkbox"/> (vi) Reference to deviations, if applicable <input checked="" type="checkbox"/> (vii) Calculation of emission reductions <input checked="" type="checkbox"/> (viii) Comparison of actual ER with estimated ER as per PDD  <i>Justification of evidences:</i>  The following web link and the revised monitoring plan can be verified for the same, <a href="http://cdm.unfccc.int/Projects/DB/DNV-CUK1185356859.49/view">http://cdm.unfccc.int/Projects/DB/DNV-CUK1185356859.49/view</a> <i>Conclusion:</i>  The approved revised monitoring plan and monitoring report is in line with the applicable methodology ACM 0002, Version 06 and actual current practise. The verification team confirms that the monitoring plan is complete and in line with the revised monitoring plan <sup>/RevMP/</sup> , which reflects the actual site conditions.  However CAR P1, CAR P2 and CAR P3 were raised and closed successfully.	<del>/CAR P1/</del> <del>/CAR P2/</del> <del>/CAR P3/</del>	OK
<b>3.5 Comparison of estimated and actual ER</b> <b>(EB 55 Annex 1, § 198c)</b> <i>Have differences between the monitored ER and the ex-ante ER been reported and appropriately justified?</i>	/PDD/ /MR5/ /XLS4/	<i>Description:</i>  As per the registered PDD, the estimated annual ER was <b>148,858 t CO<sub>2</sub>e</b> . The ER reported in the monitoring report <sup>/MR5/</sup> for the monitoring period of 2008-10-27 to 2009-11-30 (13	<del>/CLR1/</del>	OK



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>Please assess potential impacts on baseline and additionality.</i>		<p>months/400 days) is <b>114,191 t CO<sub>2</sub>e</b>.</p> <p><i>Justification of evidences:</i></p> <p>The registered PDD<sup>/PDD/</sup>, MR<sup>/MR5/</sup> and emission reduction spread sheet<sup>/XLS4/</sup> were compared. The lower energy generation of WEGs has been enquired by interview with O&amp;M officials.</p> <p><i>Conclusion:</i></p> <p>The emission reductions reported and verified for the first monitoring period are <b>114,191 t CO<sub>2</sub>e</b>.</p> <p>From the emission reduction calculation spreadsheet it is evident that there is no annual increase in the emission reduction when compared to that of the registered PDD. The plant load factor achieved during this monitoring period is 18.55%. This has happened due to lower generation than estimated. Against estimated generation of 159.712 GWh for 365 days in the PDD, only 122.526 GWh have been generated during this crediting period of 400 days. However, this has no effect either on the baseline or on the additionality.</p> <p>However CL R1 was raised and closed successfully.</p>		
<b>3.6 Transparency</b> <i>Assess if the monitoring report is transparent, i.e. clear and unequivocal in all respect?</i>	/MR5/	<p><i>Description:</i></p> <p>The monitoring report can be assessed to be transparent. No ambiguous statements have been identified.</p> <p><i>Justification of evidences:</i></p> <p>Verification team has verified all the information's and references with the registered PDD<sup>/PDD/</sup> on the UNFCCC website. In addition a detailed evaluation of the generation reports, calibration certificates, and invoices has been carried</p>	<del>/CL R1/</del>  <del>/CAP C1/</del>	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>out to check the transparency in the ER calculations. All revision in monitoring report is also verified for transparency.</p> <p><i>Conclusion:</i></p> <p>Thus the revised monitoring report is transparent and clear. No ambiguous statements are identified.</p> <p>However CL R1 and CAR C1 were raised and closed successfully.</p>		
<p><b>3.7 Misstatements on general issues</b></p> <p><i>Assess whether the monitoring report is free of material misstatements regarding issues other than the monitoring parameters.</i></p> <p><i>Discuss the monitoring parameters in detail in chapter “Monitoring Parameters”.</i></p>	<p>/MR5/ /PDD/ /XLS4/</p>	<p><i>Description:</i></p> <p>The webhosted monitoring report was analysed and the following issues have been identified:</p> <ul style="list-style-type: none"> <li>The net electricity value mentioned in kWh of the MR and value mentioned in the spread sheet is not matching. Please clarify.</li> </ul> <p><i>Justification of evidences:</i></p> <p>The revised monitoring report was submitted and verified.</p> <p><i>Conclusion:</i></p> <p>Typographical error in the MR has been rectified and the corrections are verified in the MR and found to be OK.</p> <p>However CAR C1 was raised and closed successfully.</p>	<p><del>/CAR C1/</del></p>	OK
<p><b>3.8 Deviations from the validated monitoring plan</b></p> <p><b>(EB 55 Annex 1, §§ 196-197, 204-206, 211-212)</b></p> <p><i>Assess whether the MR is in line with the validated monitoring plan?</i></p> <p><i>In case of intended changes: Have they been</i></p>	<p>/unfccc/ /RevMP/ /VAL/ /MR5/</p>	<p><i>Description:</i></p> <p>The monitoring plan was revised to reflect actual practices of monitoring and recording of electricity generated at the project site. The monitoring plan of the registered PDD was revised to include the actual monitoring at the site and calibration frequency.</p>	<p><del>/CAR P1/</del> <del>/CAR P2/</del> <del>/CAR P3/</del></p>	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>approved by the UNFCCC?</i>		<p><i>Justification of evidences:</i></p> <p>The monitoring plan in the monitoring reports<sup>/MR5/</sup> is in line with that of the approved revised monitoring plan<sup>/RevMP/</sup> and approved methodology</p> <p><a href="http://cdm.unfccc.int/filestorage/7/F/Z/7FZBDIM5QWXNSJ8LAT06R3UHC10Y9K/1259%201%20Revised%20Monitoring%20Plan.pdf?t=OHF8MTMwNDQ5MDMxMy4xMQ== nXhqeVVzxu8Vd0hC-4aEQg74eOs=">http://cdm.unfccc.int/filestorage/7/F/Z/7FZBDIM5QWXNSJ8LAT06R3UHC10Y9K/1259%201%20Revised%20Monitoring%20Plan.pdf?t=OHF8MTMwNDQ5MDMxMy4xMQ== nXhqeVVzxu8Vd0hC-4aEQg74eOs=</a></p> <p><i>Conclusion:</i></p> <p>Thus the project proponent has submitted the revised monitoring plan to UNFCCC on 2010-11-18, which subsequently received clarification request on 2011-02-13 and got registered on 2011-03-15. Thus the actual monitoring plan mentioned in the revised monitoring report is in line with the approved revised monitoring plan.</p> <p>However CAR P1, CAR P2 and CAR P3 were raised and closed successfully.</p>		
<p><b>3.9 Deviations from the approved methodology</b> <b>(EB 55 Annex 1, §§ 200, 201, 203)</b></p> <p><i>Assess whether the MR in line with the applied monitoring methodology?</i></p>	/MR5/ /ACM 0002/	<p><i>Description:</i></p> <p>No deviations from the approved methodology have been identified. Please refer to 3.8. The MR is in line with the approved methodology – ACM0002, Version 6.0.</p> <p><i>Justification of evidences:</i></p> <p>Version 6.0 of the approved methodology ACM0002 was verified and the monitoring report was found to be in line with the methodology.</p> <p><a href="http://cdm.unfccc.int/UserManagement/FileStorage/CDMWf_A">http://cdm.unfccc.int/UserManagement/FileStorage/CDMWf_A</a></p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<a href="#">M_BW759ID58ST5YEEV6WUCN5744MN763</a> <i>Conclusion:</i> The approved methodology requires that the EG <sub>y</sub> (net electricity supplied to the grid) be measured hourly and recorded monthly. The hourly data is recorded by the CMS or central monitoring system managed by EIL. The monthly data is recorded by BESCOM officials into joint meter readings <sup>/JMR/</sup> or B-Forms. The monitoring report <sup>/MR5/</sup> is in line with the approved methodology.		
<b>4. Monitoring Parameters</b> <i>(List all parameters of the PDD chapter B.7.1; pl. copy the 6 lines below for each parameter)</i>				
<b>4.1. EG<sub>y</sub></b>		<b>Description:</b> Net electricity supplied to the grid by the Project		
<b>a) Measurement / Determination method</b> <b>(EB 55 Annex 1, §§ 184-185, 202-203)</b> <i>Describe how the monitoring parameter was measured / determined.</i> <i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i> <i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>	/IM01/ /PDD/ /ACM000 2/ /MR5/ /JMR/ /INV/ /CAL/ /PPA/ /XLS4/ /RevMP/	<i>Description:</i> The main parameter to be monitored for a wind project is the net electricity supplied to the grid. In this case, the parameter EG <sub>y</sub> . “Net electricity supplied to the grid by the Project”. The parameter is measured as electricity export, import and transmission loss, which was issued by BESCOM officials and recorded in the JMR <sup>/JMR/</sup> and issued monthly to the project proponent. These monthly reports for the entire monitoring period form the basis to report the emission reductions achieved due to the project activity. The project proponent in turn raises the invoices <sup>/INV/</sup> to the BESCOM for the electricity supplied to the grid. The electricity is measured by two way energy meters of an accuracy class of 0.2% which are calibrated periodically by officials from the BESCOM.	<del>/CAR P1/</del> <del>/CAR P2/</del> <del>/CAR P3/</del>	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>This is in line with the approved revised monitoring plan.</p> <p><i>Justification of evidences:</i></p> <p>Monthly joint meter readings<sup>/JMR/</sup> authenticated by state utility and PP representative for Energy supplied value (EGy). To cross check (EGy) value, the invoice<sup>/INV/</sup> raised by the project proponent to BESCOM for commercial purpose is verified.</p> <p><i>Conclusion:</i></p> <p>The net electricity reported for the monitoring period 2008-10-27 to 2009-11-30(Both days included) is 122,526,108 kWh.</p> <p>The approved methodology requires that the EG<sub>y</sub> (net electricity supplied to the grid) be measured hourly and recorded monthly. The hourly data is recorded by the CMS or central monitoring system managed by Enercon (India) Ltd. The monthly data is recorded by BESCOM officials into joint meter readings<sup>/JMR/</sup>. The JMRs for the monitoring period have been verified and found to be OK. Hence the monitoring report<sup>/MR5/</sup> is as per the approved methodology and in line with the approved revised monitoring plan<sup>/RevMP/</sup>.</p> <p>The frequency of measurements, the energy meters, and QA/QC procedures are as per the PPA signed between BESCOM and the project proponent. The PPA has been verified and found to be OK. The meter readings are taken at the bulk meter facility and at the project site by the BESCOM officials. The transmission loss is calculated as per Article 6 of the PPA and factored into the JMR issued to the PP (please see CAR P2). The calibration frequency was not strictly followed once in a year, so the correction factor of 0.2 % was applied to export, import and transmission loss to get the net energy supplied. This</p>		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		is as per Annex 60 of EB 52. Thus, CAR P1, CARs P3 and CAR P2 are closed. All supporting documents have been verified and found to be OK.		
<b>b) Correctness</b> <b>(EB 55 Annex 1, §§ 202, 206, 221e)</b> <i>Determine whether the value given in the monitoring report is correct and sufficiently justified.</i> <i>In case of mistakes pl. provide details and descriptions of the CARs raised.</i>	/MR5/ /PDD/ /XLS4/ /INV/ /JMR/ /EB 52-A60/ /RevMP/	<input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct <i>Description:</i> The values given in the monitoring report and the corresponding ER sheet are correct. Monthly invoices raised to BESCOM along with the energy meter readings of import, export and transmission loss attested by BESCOM representative, for the entire monitoring period were submitted. The transmission loss is calculated by BESCOM which is as per the PPA. <i>Justification of evidences:</i> Monthly invoices raised to BESCOM were found to be in line with the JMR issued by BESCOM representative, for the entire monitoring period. The transmission loss calculated by BESCOM is as per the PPA. The revised ER spreadsheet was verified. <i>Conclusion:</i> The energy billed after was found to tally with the energy reported in the MR <sup>/MR5/</sup> . Due to the unavailability of calibration report for the from January 2008 till October 2009 for KBCWP-02 and for KBCWP-03 from February 2008 till April 2010, a correction of 0.2 % was applied to export, import and transmission loss to get the net energy supplied. This is as per Annex 60 of EB 52. The revised ER spreadsheet <sup>/XLS4/</sup> was verified and the correction applied is	<del>CAR G1</del>	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		acceptable and the ER reported transparent and conservative. Accordingly, the value of net electricity supplied to the grid was found to be correct and justified with suitable evidence which is in line with the approved revised monitoring plan. However CAR C1 was raised and closed successfully.		
<b>c) QA/QC Procedure</b> <b>(EB 55 Annex 1, §§ 184b (vii), 205c, 206)</b> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration and maintenance of the monitoring equipment has been carried out by competent personnel.</i>	/CAL/ /INV/ /JMR/ /PPA/ /IM01/ /TRA/ /ORG/ /SV/	<i>Description:</i> The readings are jointly recorded in the presence of the power producer and the power purchasing authority (BESCOM). The meters are calibrated as per the Power Purchase Agreement between the two parties and are on par with the industry standards. The meters are sealed by the authorities and are rendered tamper proof. It was confirmed during the site visit that training was conducted for monitoring personnel by EIL in monitoring and safety aspects as part of their QMS procedures. Data availability and management – It was confirmed during the site visit that all data pertaining to the CDM project activity was available at the EIL office at the site. All data will be stored for an additional two years after completion of crediting period. <i>Justification of evidences:</i> The same was verified at the site visit. Calibration records <sup>/CAL/</sup> have been verified and found satisfactory with some delays. Training records <sup>/TRA/</sup> were submitted and verified. <i>Conclusion:</i> The energy meters are calibrated as per the Power Purchase	CAR Q+	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>Agreement between the two parties and are on par with the industry standards with some delays for which the error has been applied for conservative emission reductions. The meters are sealed by the authorities and are rendered tamper proof. The monitoring plan is in line with the approved revised monitoring plan and the approved methodology. The monitoring personnel have been trained w.r.t monitoring procedures, handling of equipment and safety aspects. It was noted that M/s. EIL is an ISO: 9001 certified establishment and all QA/QC, data management and training procedures are integrated with the QMS of the company. The meter readings are taken at the bulk meter facility and at the project site by the BESCO officials. The transmission loss is calculated as per Article 6 of the PPA and factored into the JMR issued to the PP (please see CAR P2).</p> <p>Nevertheless CAR Q1 was raised and closed successfully.</p> <p>All supporting documents have been verified and found to be OK.</p>		
<p><b>d) Accuracy</b>  <b>(EB 55 Annex 1, §§ 205c, 206a)</b>  <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p>	<p>/CAL/  /PPA/  /MR5/  /XLS4/  /JMR/  /INV/  /EB 52-  A60/</p>	<p><i>Description:</i></p> <p>No significant inaccuracies have been identified for this parameter. The energy readings are taken from energy meters of accuracy 0.2%. The readings are jointly recorded in the presence of the power producer and the power purchasing authority (BESCO). The meters are calibrated as per the Power Purchase Agreement between the two parties and are on par with the industry standards with some delay in calibration. The meters are sealed by the authorities and are rendered tamper proof.</p>	CAR Q1	OK



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>The transmission loss calculated by BESCO is as per the PPA. Due to the unavailability of calibration report for the from January 2008 till October 2009 for KBCWP-02 and for KBCWP-03 from February 2008 till April 2010, a correction of 0.2 % was applied to export, import and transmission loss to get the net energy supplied. This is as per Annex 60 of EB 52.</p> <p><i>Justification of evidences:</i></p> <p>Calibration records<sup>/CAL/</sup> have been verified and found satisfactory. Monthly invoices<sup>/INV/</sup> raised to BESCO along with the energy meter readings of import, export and transmission loss values attested by BESCO representative, for the entire monitoring period were submitted and the same has been verified.</p> <p><i>Conclusion:</i></p> <p>The revised ER spreadsheet<sup>/XLS4/</sup> was verified and the correction applied is acceptable, and the ER reported transparent accurate and conservative.</p> <p>Nevertheless CAR Q1 was raised and closed successfully.</p>		
<p><b>e) Verification</b></p> <p><b>(EB 55 Annex 1, §§ 184a, 184b, 186, 203, 205, 206b)</b></p> <p><i>Describe how the information flow (from data generation, aggregation, to recording, calculation and reporting) for these parameters including the value was verified. Consider the measurement / determination procedure, accuracies, QA/QC procedures. Consider as well plausibility checks as</i></p>	<p>/CAL/ /PPA/ /MR5/ /XLS4/ /JMR/ /INV/ /EB 52- A60/</p>	<p><i>Description:</i></p> <p>The readings are jointly recorded in the presence of the power producer and the power purchasing authority (BESCO). The meters are calibrated as per the Power Purchase Agreement between the two parties and are on par with the industry standards. The value of <math>EG_y</math> was verified through the meter joint readings issued by BESCO at the project site. Due to the unavailability of calibration report for the from January 2008 till October 2009 for KBCWP-02 and for KBCWP-03 from February</p>	<p>CAR P1/ <del>CAR</del> P2/ <del>CAR</del> P3/ <del>CAR</del></p>	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>far as possible. Check if the applied value could be backed up by corresponding evidences (external / internal, oral or documented). Further whether sufficient evidence is available, both in terms of frequency (time period between evidence) and in covering the full monitoring period.</i>		<p>2008 till April 2010, a correction of 0.2 % was applied to export, import and transmission loss to get the net energy supplied. This is as per Annex 60 of EB 52.</p> <p>CARs P1, P2, P3 and Q1 were raised during the course of the verification.</p> <p><i>Justification of evidences:</i></p> <p>The invoices<sup>/INV/</sup>, joint meter readings<sup>/JMR/</sup>, calibration reports<sup>/CAL/</sup> and PPA were verified.</p> <p><i>Conclusion:</i></p> <p>The invoices raised to BESCOM were cross checked with the joint meter readings and were found to tally. Calibration reports have been verified and are according to the PPA with BESCOM. The monitoring plan is in line with the methodology and the revised approved monitoring plan. The PP has provided verifiable evidence and the ER reported for the entire monitoring period are traceable and conservative. CAR P1, CAR P2, CAR P3 and CAR Q1 were successfully closed.</p>	Q1/	
<b>4.2. EGexport and EGimport</b>		<b>Description:</b> Energy Export and Energy Import		
<p><b>a) Measurement / Determination method</b> <b>(EB 55 Annex 1, §§ 184-185, 202-203)</b></p> <p><i>Describe how the monitoring parameter was measured / determined.</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the</i></p>	<p>/IM01/ /PDD/ /ACM000 2/ /MR5/ /JMR/ /INV/ /CAL/ /PPA/</p>	<p><i>Description:</i></p> <p>Electricity export and Electricity import by the project activity are also monitored since this parameter is considered for calculation of net electricity supplied by the project activity. This parameter was not mentioned under monitoring of parameters in the registered PDD. So the revised monitoring plan was applied to EB and got approved. Monthly export and import energy will be recorded by the project site meters in the B-Form (i.e., two B-form- one for each feeder line). Energy exported and Energy</p>	<del>CAR P3</del>	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	/XLS4/ /RevMP/	<p>Imported by project activity will be monitored at 33 kV metering point. The meters installed at 33 kV metering point is capable of measuring both export and import of electricity.</p> <p><i>Justification of evidences:</i> Monthly joint meter readings authenticated by state utility and PP representative for Energy export and import value.</p> <p><i>Conclusion:</i> The above information is assessed to be more appropriate Based on the information collected during the interview with the state utility personnel and Enercon and review of joint meter report the DOE concludes that the revised monitoring plan results in increase of accuracy and completeness of monitoring. CAR P3 was raised and closed successfully.</p>		
<p><b>b) Correctness</b> <b>(EB 55 Annex 1, §§ 202, 206, 221e)</b></p> <p><i>Determine whether the value given in the monitoring report is correct and sufficiently justified.</i></p> <p><i>In case of mistakes pl. provide details and descriptions of the CARs raised.</i></p>	/MR5/ /PDD/ /XLS4/ /INV/ /JMR/ /EB 52-A60/ /RevMP/	<p><input checked="" type="checkbox"/> Correct      <input type="checkbox"/> Not correct</p> <p><i>Description:</i> The value EGExport and EGimport given in the revised monitoring report and the corresponding ER calculations are correct and taken from joint meter reading which is in line with the approved revised monitoring plan.</p> <p><i>Justification of evidences:</i> Verification team has checked all the JMR and invoice copies.</p> <p><i>Conclusion:</i> Based on the above evidence, DOE concludes that the value used in emission reduction for EGExport and EGimport are correct. No mistakes are found during verification stage.</p>	OK	OK
<p><b>c) QA/QC Procedure</b></p>	/CAL/	<p><i>Description:</i></p>	<del>CAR</del>	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><b>(EB 55 Annex 1, §§ 184b (vii), 205c, 206)</b></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration and maintenance of the monitoring equipment has been carried out by competent personnel.</i></p>	<p>/INV/ /JMR/ /PPA/ /IM01/ /TRA/ /ORG/ /SV/</p>	<p>Yes. All the applicable QA/QC procedures are carried out as described in revised approved monitoring plan.</p> <p>The calibration certificates for all energy meters belong to the project activity are submitted to the DOE. All the energy meters are calibrated by KPTCL. As per revised monitoring plan, all the energy meters should be calibrated at least once in a year. DOE found that there is a delay in calibration for some of the energy meters, for conservative emission reduction calculation, PP has referred Guidelines for assessing compliance with calibration frequency and applied the maximum correction factor of 0.2 % to export and import values.</p> <p><i>Justification of evidences:</i></p> <p>Verification team has checked the calibration certificates of all the installed energy meters issued by KPTCL. All the meter calibration reports are verified and found to working satisfactorily without any error during the first crediting period. In addition the DOE also verified the calculation of net generation after applying the error for delay in calibration.</p> <p><i>Conclusion:</i></p> <p>All the applicable QA/QC procedures, calibrations etc. are carried out as described in the revised monitoring plan, Guidelines for assessing compliance with calibration frequency and guidelines prevailing in the state of Karnataka related to electricity generation and distribution.</p> <p>CAR Q1 was raised and closed successfully.</p>	<del>Q1</del>	
<b>d) Accuracy</b>	<p>/CAL/ /PPA/</p>	<p><i>Description:</i></p>	<b>OK</b>	<b>OK</b>

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><b>(EB 55 Annex 1, §§ 205c, 206a)</b></p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p>	<p>/MR5/ /XLS4/ /JMR/ /INV/ /EB 52- A60/</p>	<p>Metering equipment used in the project activity is of 0.2% accuracy class. Meters should be calibrated at least once in a year by state electricity utility as per revised monitoring plan. Since there was non-availability of state utility personnel's for doing calibration, the calibration frequency was not strictly followed as required by CDM, the PP has referred to Guidelines for assessing compliance with calibration frequency and applied the maximum correction factor of 0.2% to export and import values for conservative emission reduction calculation.</p> <p><i>Justification of evidences:</i></p> <p>Data such as meter serial number, accuracy class, make etc are cross checked with the data provided in the calibration certificate. The DOE also verified the calculation of net generation after applying the error for delay in calibration of energy meters.</p> <p><i>Conclusion:</i></p> <p>DOE confirms that the approach of calculation of ERs is more conservative as per the review of all the above evidences.</p>		
<p><b>e) Verification</b></p> <p><b>(EB 55 Annex 1, §§ 184a, 184b, 186, 203, 205, 206b)</b></p> <p><i>Describe how the information flow (from data generation, aggregation, to recording, calculation and reporting) for these parameters including the value was verified. Consider the measurement / determination procedure, accuracies, QA/QC procedures. Consider as well plausibility checks as</i></p>	<p>/CAL/ /PPA/ /MR5/ /XLS4/ /JMR/ /INV/ /EB 52- A60/</p>	<p><i>Description:</i></p> <p>The parameter EGExport and EGimport is recorded jointly by officials of BESCOM and representatives from PP. The monthly joint meter readings will provide information about export and import values. All the measurements of energy readings are under the control of BESCOM and the accuracy class of meter used for this purpose is of 0.2% accuracy class. All the data will be archived and stored for 2 year crediting period.</p> <p><i>Justification of evidences:</i></p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>far as possible. Check if the applied value could be backed up by corresponding evidences (external / internal, oral or documented). Further whether sufficient evidence is available, both in terms of frequency (time period between evidence) and in covering the full monitoring period.</i>		Based on the review of joint meter readings the applied value is found to be correct both in MR and ER sheet.  <i>Conclusion:</i>  During the first verification period, all the above mentioned data are verified and found to be valid and accurate.		
<b>4.3. T<sub>E</sub></b>		<b>Description:</b> Transmission loss for export between the metering location at 33 kV point and the metering location at 220 kV at the Enercon substation.		
<b>a) Measurement / Determination method</b> <b>(EB 55 Annex 1, §§ 184-185, 202-203)</b> <i>Describe how the monitoring parameter was measured / determined.</i> <i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i> <i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>	/IM01/ /RevMP/ /ACM000 2/ /JMR/ /INV/ /unfccc/ /MR5/ /XLS4/	<i>Description:</i> Transmission loss will be calculated by the state utility and applied in monthly joint meter reading as per procedure set in the signed PPA. The calculation procedure of transmission loss is as follows, 1. Every month a joint meter reading will be prepared at 220 kV metering point for the energy export and import value for the whole wind farm. (Y) 2. Other than bulk meter monthly JMR, there are project site energy meters which is installed at 33 kV metering point for monthly energy generation details for the respective project proponent wind mills. A detailed monthly line loss calculation sheet will be prepared based on the energy export of all the WEGs belong to the wind farm. 3. The sum of energy exported by all the WEGs (Include project activity WEGs and non-project participant WEGs) will be calculated in line loss sheet.(Xi) 4. As per the procedure mentioned in the PPA, the percentage transmission loss (Z will be calculated by the	<del>CAR</del> <del>P3</del>	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>difference between the sum of energy exported by all the WEGs which is measured at 33 kV metering point (Xi) and energy exported value measured at 220 kV bulk metering point (Y) divided by sum of energy exported by all the WEGs (Xi).</p> $Z = ((X_i - Y) / X_i) * 100$ <p>5. The percentage transmission loss will be calculated for every month and the value will be applied to energy export value measured at each 33 kV metering point for transmission loss calculation of exported energy.</p> <p>6. All the transmission loss calculation procedure will be entirely under the control of state utility and the project proponents of WEGs will not have any control over the transmission loss calculation procedure and readings.</p> <p><i>Justification of evidences:</i></p> <p>Monthly joint meter readings authenticated by state utility and PP representative for Transmission loss value.</p> <p><i>Conclusion:</i></p> <p>Transmission loss percentage for the whole wind farm connected to 220 kV bulk meters which contains project participant WEGs and non-project participant WEGs will be calculated in general by apportioning mechanism by the state utility and applied to exported energy value measured at 33 kV metering point. Monthly joint meter reading mention the value of transmission loss which will be used to calculate net electricity supplied by the project activity to the grid. Thus the DOE concludes that the approach of calculation of transmission loss will result in conservative approach of emission reduction</p>		



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		calculation. CAR P3 was raised and closed successfully.		
<b>b) Correctness</b> <b>(EB 55 Annex 1, §§ 202, 206, 221e)</b> <i>Determine whether the value given in the monitoring report is correct and sufficiently justified.</i> <i>In case of mistakes pl. provide details and descriptions of the CARs raised.</i>	/IM01/ /RevMP/ /ACM000 2/ /JMR/ /INV/ /unfccc/ /MR5/ /XLS4/	<input checked="" type="checkbox"/> <i>Correct</i> <input type="checkbox"/> <i>Not correct</i> <i>Description:</i> The values given in the monitoring report and the corresponding Excel sheets are correct. <i>Justification of evidences:</i> Monthly invoices raised to BESCOM along with the energy meter readings of import and export attested by BESCOM representative, for all months of the monitoring period were submitted and the same has been verified. The transmission losses calculated by KPTCL/BESCOM in the JMRs were verified. <i>Conclusion:</i> Monthly invoices raised to KPTCL along with the net energy supplied attested by KPTCL representative, for all months of the monitoring period were submitted and the same has been verified. The joint meter readings depict the transmission loss calculated and apportioned by KPTCL/BESCOM to the project proponent WEGs connected.	OK	OK
<b>c) QA/QC Procedure</b> <b>(EB 55 Annex 1, §§ 184b (vii), 205c, 206)</b> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration and maintenance of the monitoring equipment has been</i>	/CAL/ /INV/ /JMR/ /PPA/ /IM01/	<i>Description:</i> Yes. All the applicable QA/QC procedures are carried out as described in revised approved monitoring plan. The calibration certificates for all energy meters belong to the project activity are submitted to the DOE. All the energy meters	<del>CAR Q1</del>	OK



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>carried out by competent personnel.</i>	/TRA/ /ORG/ /SV/	<p>are calibrated by KPTCL. As per revised monitoring plan, all the energy meters should be calibrated at least once in a year. DOE found that there is a delay in calibration for some of the energy meters, for conservative emission reduction calculation, PP has referred Guidelines for assessing compliance with calibration frequency and applied the maximum correction factor of 0.2 % to transmission loss values.</p> <p><i>Justification of evidences:</i></p> <p>Verification team has checked the calibration certificates of all the installed energy meters issued by KPTCL. All the meter calibration reports are verified and found to working satisfactorily without any error during the first crediting period. In addition the DOE also verified the calculation of net generation after applying the error for delay in calibration.</p> <p><i>Conclusion:</i></p> <p>All the applicable QA/QC procedures, calibrations etc. are carried out as described in the revised monitoring plan, Guidelines for assessing compliance with calibration frequency and guidelines prevailing in the state of Karnataka related to electricity generation and distribution.</p> <p>CAR Q1 was raised and closed successfully.</p>		
<p><b>d) Accuracy</b> <b>(EB 55 Annex 1, §§ 205c, 206a)</b></p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies</i></p>	/CAL/ /PPA/ /MR5/ /XLS4/ /JMR/ /INV/	<p><i>Description:</i></p> <p>Metering equipment used in the project activity is of 0.2% accuracy class. Meters should be calibrated at least once in a year by state electricity utility as per revised monitoring plan. Since there was non-availability of state utility personnel's for doing calibration, the calibration frequency was not strictly</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i>	/EB 52-A60/	<p>followed as required by CDM, the PP has referred to Guidelines for assessing compliance with calibration frequency and applied the maximum correction factor of 0.2% to transmission loss values for conservative emission reduction calculation.</p> <p><i>Justification of evidences:</i></p> <p>Data such as meter serial number, accuracy class, make etc are cross checked with the data provided in the calibration certificate. The DOE also verified the calculation of net generation after applying the error for delay in calibration of energy meters.</p> <p><i>Conclusion:</i></p> <p>DOE confirms that the approach of calculation of ERs is more conservative as per the review of all the above evidences.</p>		
<p><b>e) Verification</b></p> <p><b>(EB 55 Annex 1, §§ 184a, 184b, 186, 203, 205, 206b)</b></p> <p><i>Describe how the information flow (from data generation, aggregation, to recording, calculation and reporting) for these parameters including the value was verified. Consider the measurement / determination procedure, accuracies, QA/QC procedures. Consider as well plausibility checks as far as possible. Check if the applied value could be backed up by corresponding evidences (external / internal, oral or documented). Further whether sufficient evidence is available, both in terms of frequency (time period between evidence) and in</i></p>	<p>/CAL/ /PPA/ /MR5/ /XLS4/ /JMR/ /INV/ /EB 52-A60/</p>	<p><i>Description:</i></p> <p>The MR and ER spreadsheet have been verified and the apportioning applied as per the formula in the revised monitoring plan. The apportioning of transmission losses is conducted by the BESCO/KPTCL and hence not influenced by the PP.</p> <p><i>Justification of evidences:</i></p> <p>Based on the review of joint meter readings the applied value is found to be correct both in MR and ER sheet.</p> <p><i>Conclusion:</i></p> <p>During the first verification period, all the above mentioned data are verified and found to be valid and accurate.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>covering the full monitoring period.</i>				
<b>5. ER Calculation</b>				
<b>5.1 Traceability</b> <b>(EB 55 Annex 1, § 182)</b> <i>Assess if the calculation is fully traceable. In case of complex calculations an Excel calculation spreadsheet shall be used. All applied formulae must be visible.</i>	/XLS4/ /MR5/ /JMR/ /INV/ /EB52-A60/ /PDD/ /FValR/ /ACM0002/ /RevMP/	<p><i>Description:</i></p> <p>An excel spreadsheet was used for calculating the emission reductions achieved during the monitoring period. The calculation is completely traceable. All applied formulae are visible. Since every joint meter readings will be starting from 1<sup>st</sup> of every month, so make the emission reduction calculation simple the first 5 day energy generation calculation for this monitoring period is not included for emission reduction because it is difficult to take the few days generation as per the registered monitoring plan. BESCO will not give separate JMR for 5 day generation for the project activity. In addition because of non-availability of calibration report for the between the year 2008 and 2009, a correction of 0.2 % was applied to export and import to get the net energy exported to the grid for the entire first verification period as a conservative approach. Other than the above mentioned happenings no other information gaps have been identified.</p> <p><i>Justification of evidences:</i></p> <p>The revised excel spreadsheet<sup>/XLS4/</sup> with emission reductions for the monitoring period of 2008-10-27 to 2009-11-30, both days included.</p> <p><i>Conclusion:</i></p> <p>An excel calculation sheet was used. The calculation is completely traceable. All applied formulae are visible. The emission reductions reported were found to be in agreement with the MR<sup>/MR5/</sup>, Joint meter reading<sup>/JMR/</sup> and invoices<sup>/INV/</sup> billed to</p>	<del>/CAR G1/</del> <del>/CAR Q1/</del> <del>/CLR1/</del>	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>the BESCOM. The total emission reductions by the project activity are <b>114,191 t CO<sub>2</sub>e</b> which is more conservative and transparent since the PP has not included the first 5 days energy generation and applied maximum error factors because of not following the calibration frequency as per the revised monitoring plan. Hence the emission reduction value mentioned in the MR and spread sheet are more conservative and transparent.</p> <p>However CAR C1, CL R1 and CARQ1 were raised and closed successfully.</p>		
<p><b>5.2 Parameter consistency</b> <b>(EB 55 Annex 1, § 186)</b></p> <p><i>Assess whether all internal and external parameters and data used for calculation are applied consistently in the monitoring report and the calculation spreadsheet?</i></p> <p><i>Consider only the correct data exchange between the monitoring report and the calculation spreadsheet (if any). Further ensure that consistent designations for parameters in PDD, MR, calculation spreadsheet are applied. The evaluation of the correctness of the parameter values itself should be discussed in the chapter “Monitoring Parameters”.</i></p>	<p>/XLS4/ /MR5/ /INV/ /JMR/</p>	<p><i>Description:</i></p> <p>Net energy exported to the grid is recorded on a monthly basis as periodic direct measurement along with export, import and transmission loss values which are sourced from authenticated state electricity board (BESCOM) in the form of B-forms or joint meter readings. Readings of state-of-art electronic tri-vector meters, which are calibrated and rendered tamper proof, are taken jointly by representatives of the project proponents and KPTCL.</p> <p>Emission factor is considered as 0.93204 tCO<sub>2</sub>/MWh, as per the CEA’s annual energy generation data, version 02, emission factor for Southern Regional Grid. The baseline emission factor is fixed on ex-ante basis for the entire crediting period as per validation report and approved revised monitoring plan.</p> <p>The Excel calculation sheet is completely in line with the MR and approved revised monitoring plan. No deviant parameter values have been used in the calculation sheet.</p> <p><i>Justification of evidences:</i></p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>The revised excel spreadsheet<sup>/XLS4/</sup> with emission reductions for the monitoring period of 2008-10-27 to 2009-11-30, both days included.</p> <ol style="list-style-type: none"> <li>1. Emission reduction spread sheet provided by the project participant (related to MR4)</li> <li>2. Monitoring Report 'Enercon Wind Farm (hindustan) Ltd in Karnataka' for the period 2008-10-027 to 2009-11-30 (including both days), version 5, dated 2011-07-01</li> <li>3. Joint Meter Reading reports for electricity generation certified by BESCO covering the monitoring period</li> <li>4. Invoice raised by EIL to BESCO covering the monitoring period.</li> </ol> <p><i>Conclusion:</i></p> <p>The excel sheet reports the emission reductions for the monitoring period. No mistakes have been made in applying assumptions, data or calculations of emission reductions that will impair the estimate of emission reductions.</p>		
<p><b>5.3 Applied formulae</b> <b>(EB 55 Annex 1, §§ 204-206)</b></p> <p><i>Check if the applied formulae and methods for calculating baseline emissions, project emissions and leakage are in accordance with the monitoring plan and / or the approved methodology.</i></p>	<p>/XLS4/ /MR5/ /ACM000 2/ /JMR/ /INV/</p>	<p><i>Description:</i></p> <p>All applied formulae are in accordance with the monitoring plan approved by UNFCCC and the approved methodology as well. Emission factor is considered as 0.93204 tCO<sub>2</sub>/MWh, as per the CEA's annual energy generation data, version 02, emission factor for Southern Regional Grid. The baseline emission factor is fixed on ex-ante basis for the entire crediting period as per validation report and approved revised monitoring plan. Thus the</p>	CAR Q+	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>baseline emission reduction achieved during the first verification period is <b>114,191</b> tCO<sub>2</sub>e, project emission is 0 tCO<sub>2</sub>e and leakage is 0 tCO<sub>2</sub>e. All the procedures used for calculation are as per the monitoring methodology and approved revised monitoring plan. Hence the net emission reduction achieved during the first verification period is <b>114,191</b> tCO<sub>2</sub>e.</p> <p><i>Justification of evidences:</i></p> <p>The revised excel spreadsheet<sup>/XLS4/</sup> with emission reductions for the monitoring period of 2008-10-27 to 2009-11-30, both days included. The monitoring report<sup>/MR5/</sup>, Joint meter readings<sup>/JMR/</sup> and invoices<sup>/INV/</sup> were verified.</p> <p><i>Conclusion:</i></p> <p>GHG emission reductions achieved are calculated as per the applicable methodology. A complete set of data for the specified monitoring period is available. Information provided in the monitoring report has been cross-checked with the Joint Meter readings for all WEGs<sup>/JMR/</sup> and invoices<sup>/INV/</sup> billed to BESCOM. Due to the unavailability of calibration report for the year 2008 and 2009, a correction of 0.2 % was applied to the entire crediting period export, import and transmission loss to get the net energy exported. All the values are traceable and conservative.</p> <p>However CARQ1 is raised and closed successfully.</p>		
<p><b>5.4 Completeness of calculation</b> <b>(EB 55 Annex 1, § 205a)</b></p> <p>Assess whether the provided calculations are</p>	<p>/XLS4/ /MR5/ /PDD/</p>	<p><i>Description:</i></p> <p>The calculation is completely traceable and reflects the requirements of the revised approved monitoring plan and</p>	<p><del>/CLR1/</del> <del>/CAR G1/</del></p>	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>complete and reflect all requirements of the monitoring plan.</i></p> <p><i>Check especially that no standard or old values have been used for calculation where calculations based on up-to-date data is required.</i></p>	<p>/JMR/ /INV/ /RevMP/</p>	<p>monitoring methodology. Please refer to section 5.1 (Traceability)</p> <p><i>Justification of evidences:</i></p> <p>The revised excel spreadsheet<sup>/XLS4/</sup> with emission reductions for the monitoring period of 2008-10-027 to 2009-11-30, both days included. The monitoring report<sup>/MR5/</sup>, Joint meter readings<sup>/JMR/</sup> and invoices<sup>/INV/</sup> were verified.</p> <p><i>Conclusion:</i></p> <p>As per EB 51 Annex 3, § 204 (a), a complete set of data for the specified monitoring period is available. Joint meter readings reports and invoices for the entire monitoring period have been verified and found to be OK. All the monitoring parameters are in line with the monitoring methodology and approved revised monitoring plan<sup>/RevMP/</sup>. No information/calculation gaps have been identified.</p> <p>However CAR C1 and CL R1 was raised and closed successfully.</p>		
<b>6. Quality Management; defined organisational structure, responsibilities and competencies Internal QA/QC and document control</b>				
<p><b>6.1 Management System</b> <b>(EB 55 Annex 1, § 184 a (iii))</b></p> <p><i>Check if the GHG data monitoring system is embedded in a (certified) company quality management system, if so, check if all CDM</i></p>	<p>/O&amp;M/ /SV/ /IM01/</p>	<p><i>Description:</i></p> <p>M/s. Enercon India Ltd (EIL) is the O &amp; M contactor and service provider for this wind energy project. M/s. Enercon India Ltd is an ISO 9001 certified company. They also have adequate and technically qualified site engineers to ensure constant</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>monitoring procedures been fully integrated in the project participant's quality management system. If not how the GHG management system has been implemented.</i>		<p>monitoring of the turbines installed. The monitoring personnel are from service provider (M/s. Enercon India Ltd). They are well trained and follow reproducible routines. Thus, they have the necessary competence to carry out the relevant tasks with sufficient accuracy. All necessary monitored and measured raw data were checked during on-site verification. All the data generated at the site will be verified by the O&amp;M team and then the same has been forwarded to Enercon India Ltd head office. All CDM monitoring procedures have been fully integrated for this project activity. The daily generation report is consolidated and is compared against monthly generation report internally. Breakdown duration (if any) is analyzed as well as reasons or non-generation are recorded and reviewed since Enercon (India) Ltd is an ISO 9001 certified company.</p> <p><i>Justification of evidences:</i></p> <p>The O &amp; M activities for WEGs are carried out by EIL<sup>/O&amp;M/</sup>. EIL has a standard training procedure<sup>/TRA/</sup> which is part of their QMS. The PP has incorporated quality management procedures effectively with regard to the CDM project activity. All CDM related evidence and documents were verified during the site visit at the EIL office.</p> <p><i>Conclusion:</i></p> <p>EIL being ISO 9001 certified company; GHG monitoring is a part of their quality management system. The data generated at O&amp;M site is verified by the O&amp;M team and finally sent to project proponents for backup. So the quality of data is taken care at the source. Thus proper management systems are being implemented for this project activity.</p>		
<b>6.2 Roles and Positions</b>	/IM01/	<i>Description:</i>	OK	OK



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>Check if all roles and positions of each person in the GHG data management process are clearly defined and implemented as stated in the monitoring plan. Please consider the complete data trail from raw data generation to submission of the final data.</i></p> <p><i>Check further if only duly qualified personnel is involved in the monitoring procedures.</i></p>	/ORG/	<p>M/s. Enercon India Ltd has adequate and technically qualified site engineers to ensure constant monitoring of the turbines installed. The onsite in charge inspects the wind mills on daily basis and prepare the generation report from the SCADA. The generation report are consolidated and forwarded to the regional head and CDM corporate team for internal review and cross check. After all these process, the report was submitted to the managing director for the final approval.</p> <p>Refer 6.1 above.</p> <p><i>Justification of evidences:</i></p> <p>This was evidenced by the interview with O&amp;M contractor and the project proponent.</p> <p><i>Conclusion:</i></p> <p>All roles and positions of each person are clearly defined and implemented with regard to the monitoring plan of the registered CDM project activity.</p>		
<p><b>6.3 Trainings</b></p> <p><i>Check if initial trainings have been carried out, in case deemed necessary.</i></p>	/O&M/ /SV/ /IM01/ /TRA/	<p><i>Description:</i></p> <p>Since M/s. Enercon India Ltd is an ISO 9001 certified company, the training needs of the monitoring personnel are identified and necessary training programs are conducted by qualified personnel in the field of wind energy.</p> <p><i>Justification of evidences:</i></p> <p>It is evidenced from the following web link that M/s. Enercon India Ltd has a separate training wing for the same, <a href="http://www.enerconindia.net/serviceAcadmy.jsp?menuName=10&amp;subMenu=&amp;linkMenu=61">http://www.enerconindia.net/serviceAcadmy.jsp?menuName=10&amp;subMenu=&amp;linkMenu=61</a></p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>During site visit the training records and training procedures are reviewed.</p> <p><i>Conclusion:</i></p> <p>The personnel engaged for maintaining, and monitoring the performance of the WEGs is well qualified and is trained to discharge their duties satisfactorily. Enercon India Ltd, have standard set of training manual for their O &amp; M team. The rest of the personnel are qualified and trained on the job in documentation, archiving, reporting and maintenance of equipment. DOE conclude that there is a provision for training of monitoring personnel's in case deemed necessary.</p>		
<p><b>6.4 Troubleshooting procedures</b></p> <p><i>Describe relevant troubleshooting measures and assess whether these troubleshooting procedures have been implemented.</i></p>	<p>/IM01/ /PPA/ /O&amp;M/ /SV/</p>	<p><i>Description:</i></p> <p>All the WEGS are connected to the Centralised monitoring System SCADA through that the same can be monitored for any malfunction of the turbine unit. The energy meters are installed for each WEGs. Thus monthly JMR will be prepared based on the energy meter installed in the project site and transmission loss based on the substation metering using apportioning procedure.</p> <p><i>Justification of evidences:</i></p> <p>This was verified during the site visit by interviewing with O&amp;M officials.</p> <p><i>Conclusion:</i></p> <p>The O&amp;M operator will be in charge for the trouble shooting procedure. Being an ISO 9001 certified company the personnel are qualified and trained on the job in documentation, archiving,</p>	OK	OK


Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		reporting, trouble shooting and maintenance of equipment.		
<b>6.5 Maintenance procedures</b> Are appropriate maintenance procedures in place?	//IM01/ /TRA/ /SV/	<p><i>Description:</i></p> <p>Yes, proper maintenance procedures are in place. All hired personnel have been trained in the same. Since Enercon India Ltd is a leading O&amp;M operating company all trouble shooting measures will be taken care with appropriate measures</p> <p><i>Justification of evidences:</i></p> <p>This was verified during site visit interviews and training records.</p> <p><i>Conclusion:</i></p> <p>Proper maintenance procedures are in place. Training, operation and maintenance procedures are part of the QMS of M/s. EIL.</p>	OK	OK
<b>6.6 Internal QA/QC</b> <i>Assess whether there are any procedures in place on when, where and how checks and reviews of relevant monitoring parameters as well as further processing of the same are to be carried out. Please determine the evidences to be documented. (This might include spot checks by a second person not performing the calculations over manual data transfers, changes in assumptions and the overall reliability of the calculation processes.)</i>	/IM01/ /SV/	<p><i>Description:</i></p> <p>Yes, internal audits are conducted regularly. All procedures are reviewed during the Management Review meetings. Daily monitoring data at wind mill site are maintained and reviewed by site In charge, technicians and supervisors. These data are further reviews by site manager and top level management of Enercon India Ltd.</p> <p><i>Justification of evidences:</i></p> <p>During site visit, the O&amp;M operator including site In charge, site engineer and project proponent are interviewed. The internal audit report was also reviewed during the site visit.</p> <p><i>Conclusion:</i></p> <p>Based on the data and interview, DOE confirm that there is a</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		internal QA/QC procedure implemented and followed since EIL is an ISO 9001 certified company.		
<b>6.7 Data archive</b> Check whether all records of monitoring parameters are archived according to the monitoring plan.	/O&M/ /SV/ /IM01/ /JMR/ //INV/ /CAL/	<p><i>Description:</i>            All monitored data are archived in physical and also in electronic form. The data will be kept for the whole crediting period and additional 2 years. The monitoring related records and documents were archived in forms of hard and softcopy.</p> <p>Copies are maintained at the corporate office of O&amp;M and the project proponent, as back up, and updated regularly.</p> <p>All documents are physically available.</p> <p><i>Justification of evidences:</i>            This was evidenced at the site by checking the SCADA system at the central monitoring system of Enercon India Ltd and reviewing monthly JMR and calibration report.</p> <p><i>Conclusion:</i>            The monitoring related records and documents were archived in forms of hard and softcopy and are managed by CDM Corporate, M/s. EIL and available at the project site. All records such as JMR, invoice copies, calibration records are archived according to the monitoring plan. All documents shall be archived beyond the crediting period.</p>	OK	OK
<b>6.8 Data protection</b> Assess whether appropriate measures have been taken in order to avoid unintended or intended manipulation of the measured data.	/O&M/ /SV/ /IM01/	<p><i>Description:</i>            All data stored and archived in a daily generation data sheet. Only responsible personnel are allowed to maintain the details for further cross-checking with the monthly generation reports.</p>	OK	OK



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>The key parameters are being measured and recorded in the respective documents/registers in paper and electronic form.</p> <p><i>Justification of evidences:</i></p> <p>The same was verified by checking JMR and invoice copy submitted by the PP. During the site visit by checking the records for daily generation data by the wind mill belong to this project activity. In addition the electronic storage of data at central monitoring system (CMS) is also verified.</p> <p><i>Conclusion:</i></p> <p>The plant data is saved in computers with periodic back up on-site as well as in the corporate office. Computers and backup discs have elementary password protection. Hence EIL has taken appropriate measures to avoid unintended and intended manipulation of stored data.</p>		

## ANNEX 2: STATEMENTS OF COMPETENCE OF ALL INVOLVED PERSONNEL

<div style="text-align: center;">  <p><b>Statement of Competence</b> Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program</p> <p><b>Ms. C. Indumathi</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>SCHEME</th> <th>STATUS</th> <th>VALID UNTIL</th> </tr> </thead> <tbody> <tr> <td>CDM</td> <td>Assessor</td> <td>2013-03-16</td> </tr> <tr> <td>VCS</td> <td>Assessor</td> <td>2013-03-16</td> </tr> </tbody> </table> <p style="font-size: small;">Authorization status for technical areas within sectoral scopes:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>CODE</th> <th>TECHNICAL AREA</th> </tr> </thead> <tbody> <tr> <td>1.2</td> <td>Renewable Energies</td> </tr> </tbody> </table> <p style="font-size: x-small;">134 – Rev. 0, Date: 2011-05-31</p> <p style="font-size: x-small; text-align: right;">S01-F003 rev0 / 2010-04-19</p> </div>	SCHEME	STATUS	VALID UNTIL	CDM	Assessor	2013-03-16	VCS	Assessor	2013-03-16	CODE	TECHNICAL AREA	1.2	Renewable Energies	<div style="text-align: center;">  <p><b>Statement of Competence</b> Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program</p> <p><b>Mr. Ma Paa Puratchikkanal</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>SCHEME</th> <th>STATUS</th> <th>VALID UNTIL</th> </tr> </thead> <tbody> <tr> <td>CDM</td> <td>Senior Assessor</td> <td>2013-09-09</td> </tr> <tr> <td>VCS</td> <td>Senior Assessor</td> <td>2013-09-09</td> </tr> </tbody> </table> <p style="font-size: small;">Authorization status for technical areas within sectoral scopes:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>CODE</th> <th>TECHNICAL AREA</th> </tr> </thead> <tbody> <tr> <td>1.2</td> <td>Energy generation from renewable energy sources</td> </tr> <tr> <td>3.1</td> <td>Energy demand</td> </tr> <tr> <td>6.1</td> <td>Construction</td> </tr> <tr> <td>13.1</td> <td>Waste handling and disposal</td> </tr> <tr> <td>15.1</td> <td>Agriculture</td> </tr> </tbody> </table> <p style="font-size: x-small;">079 – Rev. 1, Date: 2011-07-05</p> <p style="font-size: x-small; text-align: right;">S01-F003 rev0 / 2010-04-19</p> </div>	SCHEME	STATUS	VALID UNTIL	CDM	Senior Assessor	2013-09-09	VCS	Senior Assessor	2013-09-09	CODE	TECHNICAL AREA	1.2	Energy generation from renewable energy sources	3.1	Energy demand	6.1	Construction	13.1	Waste handling and disposal	15.1	Agriculture
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**Statement of Competence**

Appointment and authorization according to the procedures  
of the TÜV NORD JI/CDM Certification Program

**Ms. Manjari Chandra**

SCHEME	STATUS	VALID UNTIL
CDM Validation, Verification	Assessor	2013-03-16
VCS	Assessor	2013-03-16

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewable Energies

092 – Rev. 1, Date: 2011-06-29

092\_S01-F003\_2011-06-29\_rev1

S01-F003 rev0 / 2010-04-19



**Statement of Competence**

Appointment and authorization according to the procedures  
of the TÜV NORD JI/CDM Certification Program

**Mr. Murali Ramalingam**

SCHEME	STATUS	VALID UNTIL
CDM	Assessor	2013-03-14
VCS	Assessor	2013-03-14

094 – Rev. 0, Date: 2011-03-17

094\_S01-F003\_2011-03-17\_rev0

S01-F003 rev0 / 2010-04-19



**Statement of Competence**  
Appointment and authorization according to the procedures  
of the TÜV NORD JI/CDM Certification Program

**Mr. Rainer Winter**

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor	2013-07-03
Validation, Verification	Senior Assessor	2013-07-03
J1	Senior Assessor	2013-07-03
VCS	Senior Assessor	2013-07-03

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal Energy Generation
1.2	Renewable Energies
4.1	Cement Sector
4.3	Iron and Steel
4.5	Waste Heat Recovery
5.1	Chemical Process Industries
9.1	Metal Production
11.1	Chemical Process Industries
11.2	GHG Capture and Destruction
12.1	Chemical Process Industries
13.1	Waste Handling and Disposal

003 – Rev. 3, Date: 2011-04-21

003\_B01-F003\_2011-04-21\_rev3

B01-F003 rev0 / 2010-04-19

**Statement of Competence**  
Appointment and authorization according to the procedures  
of the TÜV NORD JI/CDM Certification Program

**Mr. Ingo Klein**

SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor	2013-10-17
Validation, Verification	Lead Assessor	2013-10-17
VCS	Lead Assessor	2013-10-17

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewable Energies

122 – Rev. 0, Date: 2011-03-18

122\_B01-F003\_2011-03-18\_rev0

B01-F003 rev0 / 2010-04-19