



---

# VALIDATION REPORT

---

## “50.4 MW Tata Wind Farm - in Maharashtra” in India

REPORT NO. 2007-1053

REVISION NO. 05

DET NORSKE VERITAS



# VALIDATION REPORT

DET NORSKE VERITAS  
CERTIFICATION AS

Veritasveien 1  
N-1322 Høvik  
Norway  
<http://www.dnv.com>

Date of first issue: <b>06 July 2006</b>	Project No.: <b>PRJC-151777-2009-CCS-IND</b>
Approved by: <b>Michael Lehmann</b>	Organisational unit: <b>Climate Change Services</b>
Client: <b>Enercon India Limited</b>	Client ref.: <b>Mr. Yogesh Mehra</b>

**Project Name:** 50.4 MW Tata Wind Farm - in Maharashtra  
**Country:** India  
**Methodology:** ACM0002  
**Version:** 09  
**GHG reducing Measure/Technology:** Grid-connected electricity generation from renewable energy sources (wind energy).  
**ER estimate:** 83 022 t CO<sub>2</sub>e per year  
**Size**  
☒ Large Scale  
☐ Small Scale  
**Validation Phases:**  
☒ Desk Review  
☒ Follow up interviews  
☒ Resolution of outstanding issues  
**Validation Status**  
☐ Corrective Actions Requested  
☐ Clarifications Requested  
☒ Full Approval and submission for registration  
☐ Rejected  

In summary, it is DNV's opinion that the "50.4 MW Tata Wind Farm - in Maharashtra" project in India as described in the PDD of version 7.0 dated 03 March 2010, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0002 version 09. Hence, DNV requests the registration of the "50.4 MW Tata Wind Farm - in Maharashtra" project in India as a CDM project. This report has been revised as a response to minor correction request from UNFCCC during request for registration.

Report No.: <b>2007-1053</b>	Date of this revision: <b>01 June 2010</b>	Rev. No. <b>05</b>
Report title: <b>"50.4 MW Tata Wind Farm - in Maharashtra" in India</b>		
Work carried out by: <b>Maa Paa Kanal, Govindarajulu Murali, Gaurav Srivastava</b>		
Work verified by: <b>Kakaraparthi Venkata Raman</b>		

Key words:

**Validation**

**Clean Development Mechanism**

**Hydropower**

**Kyoto Protocol**

☒ No distribution without permission from the Client or responsible organisational unit

☐ Limited distribution

☐ Unrestricted distribution




---

## VALIDATION REPORT

---

### Abbreviations

BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Clarification request
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
CM	Combined Margin
DPR	Detailed Project report
DNV	Det Norske Veritas
DNA	Designated National Authority
EIA	Environment Impact Assessment
EIL	Enercon India Limited
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of return
MP	Monitoring Plan
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
TPCL	Tata Power Company Limited
WEG's	Wind Energy Generators
WREG	Western Regional Electricity Grid
UNFCCC	United Nations Framework Convention on Climate Change




---

# VALIDATION REPORT

---

## TABLE OF CONTENTS

1	EXECUTIVE SUMMARY – VALIDATION OPINION .....	1
2	INTRODUCTION .....	2
2.1	Objective	2
2.2	Scope	2
3	METHODOLOGY .....	3
3.1	Desk Review of the Project Design Documentation	3
3.2	Follow-up Interviews with Project Stakeholders	5
3.3	Resolution of Outstanding Issues	5
3.4	Internal Quality Control	7
3.5	3.5 Validation Team	8
4	VALIDATION FINDINGS .....	9
4.1	Participation Requirements	9
4.2	Project Design	9
4.3	Baseline Determination	10
4.4	Additionality	11
4.5	Monitoring	18
4.6	Estimate of GHG Emissions	19
4.7	Environmental Impacts	19
4.8	Comments by Local Stakeholders	19
4.9	Comments by Parties, Stakeholders and NGOs	19

Appendix A: Validation Protocol

Appendix B: Certificates of Competence



---

## VALIDATION REPORT

---

### 1 EXECUTIVE SUMMARY – VALIDATION OPINION

*Det Norske Veritas Certification AS (DNV) has performed a validation of the “50.4 MW Tata Wind Farm - in Maharashtra” project in India. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host Party criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.*

*The review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.*

*The host Party is India and the Annex I Party is Sweden. Both Parties fulfil the participation criteria and have approved the project and authorized the project participant’s /2/ /35/. The DNA of India has confirmed that the project assist in achieving sustainable development /2/.*

*The project correctly applies ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, version 09 /3/. The monitoring methodology is ACM0002 version 09.*

*By generating electricity from renewable energy sources and exporting the electricity to the western regional grid of India, the project activity displaces equivalent grid power, which is pre-dominantly fossil fuel based. Hence, the project results in reductions of CO<sub>2</sub> emissions that is real, measurable and gives long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.*

*The total emission reductions from the project are estimated to be on the average 83 022 t CO<sub>2e</sub> per year over the selected 10 year fixed crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.*

*The monitoring methodology ACM0002 version 09 has been applied correctly. The procedures for monitoring, operating and maintenance have been elaborated as per the requirement of the methodology. Adequate training and monitoring procedures have been implemented.*

*In summary, it is DNV’s opinion that the “50.4 MW Tata Wind Farm - in Maharashtra” project in India, as described in the PDD of version 7.0 dated 03 March 2010, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0002 version 09. DNV thus requests the registration of the “50.4 MW Tata Wind Farm - in Maharashtra” project in India as a CDM project activity.*



---

## VALIDATION REPORT

---

### 2 INTRODUCTION

Enercon India Limited (EIL) has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the “50.4 MW Tata Wind Farm - in Maharashtra” project in India (hereafter called “the project”). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board.

#### 2.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

#### 2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0002 version 09 /3/. The validation was based on the recommendations in the Validation and Verification Manual /2/.

The validation is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.



## VALIDATION REPORT

### 3 METHODOLOGY

The validation consisted of the following three phases:

- I a desk review of the project design documents
- II follow-up interviews with project stakeholders
- III the resolution of outstanding issues and the issuance of the final validation report and opinion.

The following sections outline each step in more detail.

#### 3.1 Desk Review of the Project Design Documentation

The following table lists the documentation that was assessed during the validation:

- /1/ Project Design Document, 50.4 MW Tata Wind Farm - in Maharashtra project in India, Version 01 dated 15 February 2007, and the final version 7.0 dated 03 March 2010.
- /2/ Letter of Approval from DNA of India dated 18 January 2008.
- /3/ CDM Executive Board: ACM0002, *Consolidated baseline methodology for grid-connected electricity generation from renewable sources*, Version 09.
- /4/ CDM Executive Board: *Validation and Verification Manual*, version 01.
- /5/ CDM Executive Board: Tool for demonstration and assessment of additionality, Version 5.2.
- /6/ Page 33 of Maharashtra Electricity Regulatory commission tariff order dated 24 Nov 2003 for PLF considered for tariff calculation for group III (commissioned after 1st April, 2003) projects.
- /7/ Purchase Order placed for Wind Energy Generators on Enercon India Limited, dated 16 August 2006.
- /8/ CEA: CO<sub>2</sub> Baseline Database for the Indian Power Sector version 1.1 dated 21 December 2006.  
[www.cea.nic.in](http://www.cea.nic.in)
- /9/ Detailed Project Report prepared by Tata Power Company Limited dated 03 April 2006.
- /10/ Minutes of meeting of board of director's held on 25 April 2006 & 29 May 2006.
- /11/ Agreement for CDM Consultancy between Enercon India limited & Tata Power Company Limited dated 30 November 2006.
- /12/ CDM Validation contract with DNV dated December 2006.
- /13/ Rapid Environmental Impact Assessment carried out by Care Sustainability January 2007.
- /14/ Commissioning certificates of Wind Energy Generators dated 10 March 2007, 22 March 2007, 29 March 2007, 31 March 2007, 10 April 2007, 07 May 2007, 30 November 2007 & 15 December 2007.
- /15/ Letter from project proponent to DNA of India for incorporation of Tata Power Company Limited as Party dated 14 November 2007.
- /16/ Prime lending rate proposed by Reserve Bank of India:  
<http://rbidocs.rbi.org.in/rdocs/Wss/DOCs/72074.xls>
- /17/ Risk free rate proposed by Reserve Bank of India:  
<http://rbidocs.rbi.org.in/rdocs/Publications/PDFs/80303.pdf>



## VALIDATION REPORT

- /18/ BSE Sensex data from April 1979 to July 2006 available at [www.bseindia.com](http://www.bseindia.com)
- /19/ Weighted average cost of capital calculation worksheet sheet & project Investment analysis sheet.
- /20/ Letter from Asian Development Bank (ADB) involved in project financing to confirm that revenue from CDM was considered as a part of project cash flows dated 13 February 2007.
- /21/ IREDA hurdle rate of 12% for financing wind power projects in India.
- /22/ Confirmation form IREDA dated 19 November 2008 that project activity was evaluated against the benchmark of 12%.
- /23/ <http://www.windpowerindia.com/statyear.html> to demonstrate wind capacity in state of Maharashtra at the time of investment decision & project commissioning.
- /24/ Maharashtra Electricity Regulatory Commission tariff order dated 24 Nov 2003.
- /25/ Detailed spreadsheet with CDM links of all CDM projects or projects under CDM pipeline to demonstrate common practice analysis.
- /26/ A notice published in the local newspaper, Sarvmat on 29 October 2006 inviting stakeholders to comment on the project.
- /27/ Minutes of meeting of local stakeholder meeting conducted on 15 November 2006.
- /28/ Quotation received from Enercon India Limited dated 27 March 2006 for the project activity.
- /29/ Project IRR calculation spreadsheet.
- /30/ MEDA electricity generation data of Ahmednagar for year 2004-05.
- /31/ Electricity generation data of Tata 17 MW wind power project for year 2002-03 & 2004-05 available with project proponent.
- /32/ Maharashtra wind power policy 1998 to demonstrate sales tax benefits for wind power projects.  
<http://www.mercindia.org.in/pdf/Clarificatory%20Order-Wind%20Energy%20%5BCase%20Nos%207,%2015%20&%2016%20of%202004%5D.pdf>
- /33/ CDM Executive Board: Guidance on Investment Analysis, EB 41 Annex 45.
- /34/ Quotation request to Enercon India Limited dated 22 March 2006.
- /35/ Letter of Approval from DNA of Sweden dated 08 October 2009.
- /36/ Independent third party report (Ravi Enteck Limited, Chennai) dated August 2006 on generation estimate for wind energy project of 50.4 MW in Kandke in Maharashtra.
- /37/ CDM Executive Board: Tool to calculate the emission factor for an electricity system, version 2.
- /38/ Income Tax Act 1961, sourced from Income Tax Department, Ministry of Finance.  
<http://law.incometaxindia.gov.in/TaxmannDit/DisplayPage/dpage1.aspx>
- /39/ Central Electricity Regulatory Commission (CERC) guidance on renewable energy projects dated 16 September 2009.  
<http://www.inwea.org/Inwea/cercnotification2009.pdf.pdf>
- /40/ Extract of energy purchase agreement signed between Tata Power Wind Energy Business and Tata Power Distribution Business dated 2 February 2007.
- /41/ Sales Invoices raised to Tata Power Distribution Business in financial year 2007-08,





## VALIDATION REPORT

2008-09 and 2009-10.

/42/ Letter from Independent statutory Auditor (Deloitte Haskins and Sells) dated: 27 May 2010 Confirming that the electricity tariff value received for financial year 2007-08, 2008-09 and 2009-10.

Main changes between the version of the PDD published for the 30 days stakeholder commenting period and the version of the PDD submitted for registration are:

- Application of the tool for demonstration and assessment of additionality, Version 5.2.
- Change in the version of the applied methodology
- Change in start date of crediting period.
- Inclusion of sensitivity Analysis
- Changes to monitoring plan
- Annex I Party Added

### 3.2 Follow-up Interviews with Project Stakeholders

On 26 June 2007 DNV performed interviews at the project site with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representative of the project owner, Enercon India Limited (EIL) & Tata Power Company Limited (TPCL) were interviewed. The main topics of the interviews are summarized in Table below:

Date	Name	Organization	Topic
26 June 2007	Mr. Brij Mohan	Enercon India Limited (EIL)	➤ Financials of the project activity
	Mr. Himanshu Bhatnagar		➤ Environmental compliance
	Mr. Rajiv Samant	Tata Power Company Limited (TPCL)	➤ Estimated emission reductions
			➤ Project additionality
			➤ Stakeholders consultation process
			➤ Technology applied and operational lifetime
			➤ Monitoring and reporting procedures
			➤ Calibration, internal audit and corrective action procedures
			➤ Provisions for training, operation and maintenance

### 3.3 Resolution of Outstanding Issues

The objective of this phase of the validation was to resolve any outstanding issues which needed be clarified prior to DNV's positive conclusion on the project design. In order to ensure transparency a validation protocol was customised for the project. The protocol shows in a transparent manner the criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:



---

## VALIDATION REPORT

---

- It organises, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of three tables. The different columns in these tables are described in the figure below. The completed validation protocol for the “50.4 MW Tata Wind Farm - in Maharashtra” project in India is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of CDM criteria or where a risk to the fulfilment of project objectives is identified. Corrective action requests (CAR) are issued, where:

- i) mistakes have been made with a direct influence on project results;
- ii) CDM and/or methodology specific requirements have not been met; or
- iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

A request for clarification (CL) may be used where additional information is needed to fully clarify an issue.

This report has been revised in response to minor correction request from UNFCCC during request for registration.



## VALIDATION REPORT

<b>Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities</b>				
<b>Requirement</b>	<b>Reference</b>	<b>Conclusion</b>		
<i>The requirements the project must meet.</i>	<i>Gives reference to the legislation or agreement where the requirement is found.</i>	<i>This is acceptable based on evidence provided (OK), a <b>Corrective Action Request (CAR)</b> of risk or non-compliance with stated requirements or a request for <b>Clarification (CL)</b> where further clarifications are needed.</i>		

  

<b>Validation Protocol Table 2: Requirement checklist</b>				
<b>Checklist Question</b>	<b>Reference</b>	<b>Means of verification (MoV)</b>	<b>Comment</b>	<b>Draft and/or Final Conclusion</b>
<i>The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the large-scale PDD template, version 03 - in effect as of: 28 July 2006. Each section is then further sub-divided.</i>	<i>Gives reference to documents where the answer to the checklist question or item is found.</i>	<i>Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.</i>	<i>The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.</i>	<i>This is either acceptable based on evidence provided (OK), or a <b>corrective action request (CAR)</b> due to non-compliance with the checklist question (See below). A request for clarification (CL) is used when the validation team has identified a need for further clarification.</i>

  

<b>Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests</b>			
<b>Draft report clarifications and corrective action requests</b>	<b>Ref. to checklist question in table 2</b>	<b>Summary of project owner response</b>	<b>Validation conclusion</b>
<i>If the conclusions from the draft Validation are either a CAR or a CL, these should be listed in this section.</i>	<i>Reference to the checklist question number in Table 2 where the CAR or CL is explained.</i>	<i>The responses given by the project participants during the communications with the validation team should be summarised in this section.</i>	<i>This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".</i>

**Figure 1: Validation protocol tables**

### 3.4 Internal Quality Control

The validation report underwent a technical review, and the technical review was performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.



## VALIDATION REPORT

### 3.5 Validation Team

<i>Role/Qualification</i>	<i>Last Name</i>	<i>First Name</i>	<i>Country</i>	<i>Type of involvement</i>					
				Desk review	Site Interviews	Reporting	Supervision of work	Technical review	Expert input
CDM validator / technical team leader	Murali	Govindarajulu	India	√		√	√		
GHG auditor	Maa Paa	Kanal	India	√	√	√			
GHG auditor	Srivastava	Gaurav	India	√		√			
Technical Reviewer	Kakaraparthi	Venkata Raman	India					√	

The qualification of each individual validation team member is detailed in Appendix B to this report.



## VALIDATION REPORT

### 4 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

The final validation findings relate to the project design as documented and described in the revised project design document version 07 of 03 March 2010 /1/.

#### 4.1 Participation Requirements

The project participants are Enercon India Limited (EIL) and Tata Power Company Limited (TPCL) of host Party India and Asian Development Bank, as trustee of Asia Pacific Carbon Fund of Sweden. Both, India, as a host Party, and the Annex-1 party Sweden fulfil the criteria for participating in a CDM project activity. They have both ratified the Kyoto Protocol and have established the designated national authorities for CDM related activities. The Ministry of Environment & Forest is the designated national authority of India and the Swedish Energy Agency is the designated national authority of the Sweden.

The DNA of India has approved the project activity on 18 January 2008 and also confirmed that the project contributes to sustainable development /2/. The DNA of the Sweden has approved the project on 08 October 2009, authorizing Asian Development Bank, as trustee of Asia Pacific Carbon Fund of Sweden as project participant /35/. Both LoAs were provided by the project proponent and DNV has checked that the project is approved by the DNA of India.

The validation did not reveal any information indicating that the project can be seen as a diversion of official development assistance (ODA) funding towards India.

#### 4.2 Project Design

The wind farm of Tata Power Company Limited has an installed capacity of 50.4 MW and the entire power generated is being exported to the Maharashtra state grid which is a part of the western regional grid of India.

The project activity consists of the installation of 63 wind energy generators (WEGs) each of 800 kW rating, thereby aggregating to 50.4 MW, in the Agadgaon, Devegaon, Mehekari, and Ranjani villages in Khandke Taluka of Ahmednagar District of Maharashtra state in India. All the WEGs in the project have been supplied by Enercon India Limited (EIL), who is also responsible for the operation, maintenance and management of the project. The energy generated will be supplied via the Maharashtra state electricity grid to the western regional grid of India. By the implementation of the project activity, energy generated by project activity using renewable energy will displace equivalent energy generation from the fossil fuel dominated western regional grid of India. The project is expected to generate 88.301 GWh of energy per annum at a plant load factor of 20% /6/ /9/. DNV confirms that the electricity generation data considered for investment analysis meets the requirement of EB 48 Annex 11 as DNV has also cross checked the PLF and generation estimate for the project activity from the independent third party report (Ravi Enteck Limited, Chennai) dated August 2006 on generation estimate for the project activity. The report also states that generation estimate of WEG model E-48 (800 kW) at Agadgaon, Devegaon, Mehekari, and Ranjani villages in Khandke Taluka of Ahmednagar District of Maharashtra state in India to be around 1.352 million kW per turbine (PLF at 19.29%) /36/. Hence the PLF considered by PP for investment analysis based on the average PLF recommended by Maharashtra Electricity



## VALIDATION REPORT

Regulatory Commission (MERC) for group III (commissioned after 1st April, 2003) projects is deemed conservative /6/.

The start date of the project activity has been identified as 16 August 2006, which is the date of purchase order placed for the wind turbines of the project activity /7/. The lifetime of the project is 20 years which is reasonable for a WEG. The project has selected a fixed crediting period of 10 years with the start date of the crediting period to be 1 May 2010 (or on the date of registration of the CDM project activity, whichever is later). The project is expected to result in 83 022 t CO<sub>2</sub>e emission reductions per annum over the crediting period.

### 4.3 Baseline Determination

The project correctly applies the approved baseline methodology ACM0002, version 09 “*Consolidated baseline methodology for grid-connected electricity generation from renewable sources*” /3/. The applicability of this methodology is justified as:

- The application of methodology ACM0002 Version 09 is justified as the project generates electricity using wind potential available in the region and it displaces fossil fuel based electricity from the western regional grid of India and has been verified from the purchase order placed for the project activity on 16 August 2006 /7/.
- The project activity is connected to the western regional grid of India, and the system boundaries are clearly identified and information on the characteristics of this grid is available /8/.
- The project does not involve an on-site switch from fossil fuels to a renewable source.

**Baseline Scenario:** Two alternatives to the project activity have been considered as the baseline scenario. These are i) project activity without CDM benefits and ii) continuation of current scenario of power generation from existing grid-connected power plants. Both alternatives are in compliance with the laws and regulations of India and might be considered as baseline scenarios.

However, as discussed later (section B.4.4), the implementation of project activity without CDM benefits faces investment barriers, and hence, the selected baseline scenario is that an equivalent amount of electricity would, in the absence of the project activity, have been generated by the operation of grid connected power plants and by the addition of new generation sources. The selection of the baseline is in line with the EB guidance provided in “*Validation and Verification Manual*”, version 01 /4/, which states that in case the applied methodology prescribes the baseline scenario no further analysis is required.

DNV considers the list of realistic and credible alternatives to be complete and the determination of the baseline transparent.

As the project activity supplies electricity to the Maharashtra state electricity grid which forms a part of the western region grid of India, the baseline for this project activity is a function of the generation mix of the western region grid of India. The selection of the western region grid of India as the grid system boundary for the project activity is in line with the EB guidance for large countries such as India. In line with the guidance provided in the “*Tool to calculate the emission factor for an electricity system*” /37/, the weights for OM and BM have been taken as 75:25. The combined margin emission coefficient for the western regional grid of India has been calculated at 0.940 22 tCO<sub>2</sub>e/MWh and is fixed ex-ante for the entire crediting period. The combined margin emission factor value has been sourced from



## VALIDATION REPORT

data by the Central Electricity Authority (CEA) of the Ministry of Power, Government of India. CEA has published a database of carbon dioxide emission factors from the power sector in India based on detailed authenticated information obtained from all operating power stations in the country /8/. This CO<sub>2</sub> baseline database provides information about the OM and BM factors of all the regional electricity grids in India. DNV confirms that the CEA database version 1.1 used for calculation of combined margin emission coefficient for the western regional grid of India was the latest data available at the time of the commencement of validation (inline with the requirement of “Tool to calculate the emission factor for an electricity system”) and same was used during the webhosting of the PDD<sup>1</sup>.

DNV confirms that this is an official publication of the Government of India for the purpose of CDM baselines. The OM in the CEA database is calculated *ex-ante* using the simple OM approach based on the generation-weighted average emissions per electricity unit over a three year period of 2002-2003, 2003-2004 and 2004-2005 /8/. BM is calculated *ex ante* based on the 20% most recent capacity additions in the western grid based on net generation for the year 2004-05 as described in ACM0002 version 09 /3/. The operating margin has been determined to be 0.99455 tCO<sub>2</sub>e/MWh and the build margin to be 0.7772 tCO<sub>2</sub>e/MWh /8/. The selected sources and gases are justified for the project activity.

	GHGs involved	Description
Baseline emissions	CO <sub>2</sub>	The major emission source. The GHG emission reduction is achieved by displacing the electricity generated by fossil fuel based power plants in the western regional grid of India.
Project emissions	No project emissions	NA
Leakage	No Leakage	NA

### 4.4 Additionality

The additionality of the project activity is demonstrated by applying the “Tool for demonstration and assessment of additionality”, version 5.2 /5/, and primarily through an investment analysis.

#### 4.4.1 CDM consideration and continued action to secure CDM status:

The start date of the project activity has been identified as 16 August 2006, which is the date of purchase order placed for the wind turbines of the project activity /7/. The project activity was commissioned in phases starting from 10 March 2007 and ending on 15 December 2007 /14/.

The CDM consideration for the project activity has been demonstrated from the following milestones:

- 22 March 2006 Tata Power Company Limited (TPC) requested Enercon India Limited (EIL) to submit quotation for the project activity /34/.
- TPC received quotation from Enercon India Limited on 27 March 2006 /28/.

<sup>1</sup> <http://cdm.unfccc.int/Projects/Validation/DB/YDVN272KZ2O0MVWUAW17TT0TMALXBX/view.html>





---

## VALIDATION REPORT

---

- Preparation of the detailed project report for the project on 03 April 2006 /9/ based on the quotation from EIL, which recommended the project activity as economically viable with CDM benefits.
- Evaluation of the DPR by board of director's on its meeting held on 25 April & 29 May 2006 /10/.
- Approval of the project activity by the Board of Directors of Tata Power after considering the CDM benefits /10/. That CDM revenues were a decisive factor to go ahead with the project activity can also be verified from the purchase order placed on 16 August 2006 which also clearly states that CDM revenue from the project activity was considered from the project. /7/.
- CDM consideration for the project was also verified from the letter from ADB dated 13 February 2007 which states that revenue from CDM was considered as a part of project cash flows /20/.

### Continued action to secure CDM status:

- After the starting date of 16 August 2006, the project proponent selected Enercon India Limited as CDM consultants on 11 September 2006 to undertake the project as a CDM activity and the firm contract with the consultant was established on 30 November 2006 /11/.
- The validator was appointed on December 2006 /12/.
- In January 2007 Care Sustainability carried out the Rapid Environmental Impact Assessment (EIA) for the project activity /13/.
- On 26 April 2007 the PDD was webhosted on UNFCCC website for global stakeholder consultation process.
- On 28 May 2007 the project proponent had provided a presentation to DNA of India for host country approval.
- The DNA Approval for the project activity was obtained on 25 September 2007, but in this approval the name of Tata Power Company Limited (other participant for the project activity) was missed out, hence on 14 November 2007 the project proponent approached DNA again for revised Letter of Approval /15/.
- On 18 January 2008 the corrected Letter of Approval for the project activity was received /2/.

The above sequence of events establishes that real actions were taken to secure CDM status for the project in parallel with its implementation.

### **4.4.2 Identification of alternatives to the project activity**

**Step 1:** Two alternatives to the project activity have been considered as the baseline scenario. These are i) project activity without CDM benefits and ii) continuation of current scenario in this case that an equivalent amount of electricity would, in the absence of the project activity, have been generated by the operation of grid connected power plants and by the addition of new generation sources. Both alternatives are in compliance with the laws and regulations of India and might be considered as baseline scenarios. However, as discussed below (section 4.4.3), the project without CDM benefits faces barriers in implementation.





## VALIDATION REPORT

### 4.4.3 Investment analysis: Choice of approach:

To demonstrate the additionality of the project, the project proponent has calculated the IRR of the project for a period of 20 years.

The project generates revenues without CDM and the alternative of grid based electricity generation does not involve any investment on the part of the project proponent. Therefore, a benchmark analysis is considered suitable for demonstrating the additionality of the project.

### 4.4.4 Investment analysis: Benchmark selection:

The benchmark applied by the project proponent at the time of decision making was the post tax 16% equity IRR as per the Maharashtra Electricity Regulatory Commission (MERC) of India to determine the tariff /24/. In view of the EB guidelines vide EB 40 paragraph 40 that this benchmark is applicable for tariff calculation and hence cannot be used as a benchmark for financial evaluation of project activity, the project participant has attempted to determine an alternate appropriate benchmark for the project activity. The investment decision for the project activity was taken based on the detailed project report of April 2006 /9/ which clearly discusses project and equity IRR with and without CDM revenues. At the time when the investment decision for the project activity was taken, the other available benchmarks for the project participant were as follows,

- Benchmark/financial hurdle rate of 12% of the Indian Renewable energy Development Agency (IREDA). DNV has verified that the financial hurdle rate is as per operational policy statement of IREDA and is a publically available benchmark for wind power projects /21/.
- Project-IRR benchmark of weighted average cost of capital (WACC) for the power sector in India, which can be compared against the project IRR /19/. The WACC is a calculated figure and has been verified by DNV.

DNV has confirmed from letter from IREDA dated 19 November 2008 that project activity was evaluated against the benchmark/financial hurdle rate of 12% /22/ for their loan sanctioning.

The option of weighted average cost of capital (WACC) for the power sector in India as a benchmark is appropriate and in line with the Guidance on the Assessment of Investment Analysis (EB45) which state that a) weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR (point 11) and applicable for projects which could be developed by an entity other than the project participant and b) the benchmark should be based on publicly available data sources which can be clearly validated by the DOE. Such data sources may include local lending and equity indices (Para 12).

The weighted average cost of capital for the power sector in India has been calculated based on the prime lending rate of 11.125% proposed by the Reserve Bank of India /16/ applicable at the time of investment decision for the project activity, and the cost of equity determined by using the Capital Asset Pricing Model (CAPM). The key parameters of the CAPM model have been calculated as follows:

1. A risk free rate of 7.34%, applicable at the time of investment decision. The project participant has sourced this value ( $R_f = 7.34\%$ ) from the annual report of the Reserve Bank of India. The validation team accepted this value as it has been sourced directly from the RBI report, which is authentic and reliable and has been verified from the website of Reserve Bank of India /17/.



## VALIDATION REPORT

2. Market return ( $R_m$ ) or Compound Accumulated Growth Rate (CAGR) is calculated based on market performance data for a period (01 April 1979 to 31 July 2006). The data for the same has been sourced and verified from BSE Sensex data available at Bombay Stock Exchange website /18/.
3. The average raw beta value among all the conventional and non conventional power plants listed in the Bombay Stock Exchange for the period of three year (30 April 2003 to 31 March 2006) has been applied for the calculation of cost of equity of the project. Screenshots of the beta values for individual companies published by Bloomberg are provided in Appendix 3 of PDD. These beta values were prevailing at the time of investment decision.

The minimum expected return of equity based on the CAPM Model worked out to be 23.6%. Based on CAPM model and lending rate the weighted average cost of capital works out to be 13.99% /19/.

Since the WACC calculated is at 13.99% and higher than the financial hurdle rate of 12% proposed by IREDA, DNV has accepted the use of IREDA benchmark as benchmark for the project activity.

### 4.4.5 Investment analysis: Input parameters:

Prior to investment decision for the project activity, the project proponent has invited quotations from different wind turbine manufacturers and prepared a DPR on 03 April 2006, based on the bid comparison document. Hence, the input parameters used in the financial analysis of the project activity are either sourced from the DPR developed by Tata Power Company Limited of April 2006 /9/ or MERC tariff order of 24 November 2003 /24/.

**Project cost:** DNV has cross checked the project cost from the actual purchase order value and confirms the project cost matches the investment cost considered for the financial analysis /19/. Given this short period of time between the detailed project report preparation and the decision to proceed with the project activity, it is thus reasonable to assume that the DPR of 03 April 2006 prepared based on the bid comparison document has been the basis of the decision to proceed with the investment in the project. DNV has compared the investment cost per MW, the percentage of operation and maintenance costs relative to total investment costs, electricity tariff and the load factor considered in financial analysis against the detailed project report and bid comparison document /9/ and the input values were found to be consistent.

**Electricity tariff:** The electricity tariff considered in detailed project report is based on the Maharashtra Electricity Regulatory Commission (MERC) for group III (commissioned after 1st April, 2003) projects tariff order dated 24 November 2003 /24/. DNV confirms that the electricity tariff used for the investment analysis of the project activity has been sourced from the Maharashtra Electricity Regulation commission tariff order dated 24 November 2003, which is still valid and applicable for all wind power projects in Maharashtra that have come up after November 2003 /6/. DNV has cross checked the electricity tariff applicable for the project activity and found it to be INR 3.50/kWh with annual escalation of INR 0.15/kWh till 13<sup>th</sup> year of operation. It has been verified by DNV from recent sales invoice raised to Maharashtra state electricity distribution company limited /41/. DNV has cross checked energy purchase agreement signed between Tata Power- wind energy business and Tata



## VALIDATION REPORT

Power- distribution business for the project activity /40/, sales invoices raised to Tata Power- distribution business /41/ and letter from independent statutory Auditor (Deloitte Haskins and Sells) dated: 27 May 2010 confirming on the electricity tariff value received for financial year 2007-08, 2008-09 and 2009-10 /42/. This verification is in line with Para 109 of VVM manual version 1 and confirms the actual electricity tariff matches with the values provided in Maharashtra Electricity Regulation commission tariff order dated 24 November 2003 and energy purchase agreement /40/.

Plant load factor: The PLF of 20% considered in the financial analysis is based on the average PLF in the region recommended by Maharashtra Electricity Regulatory Commission (MERC) for the purposes of tariff calculation (for group III projects commissioned after 1st April, 2003) in its tariff order dated 24 November 2003 /24/. DNV confirms that the electricity generation data considered for investment analysis meets the requirement of EB 48 Annex 11 as DNV has also cross checked the PLF and generation estimate for the project activity from the independent third party report (Ravi Enteck Limited, Chennai) dated August 2006 on generation estimate for the project activity. The report also states that generation estimate of WEG model E-48 (800 kW) at Agadgaon, Devegaon, Mehekari, and Ranjani villages in Khandke Taluka of Ahmednagar District of Maharashtra state in India to be around 1.352 million kW per turbine (PLF at 19.29%) /36/. Hence the PLF considered by PP for investment analysis based on the average PLF recommended by Maharashtra Electricity Regulatory Commission (MERC) for group III (commissioned after 1st April, 2003) projects is deemed conservative /6/.

Income tax has been calculated at the rate of 33% and minimum alternate tax at the rate of 10% /38/. All the taxes and incentives are confirmed to be applied correctly and as per the Indian Income Tax Act /38/. Straight line depreciation has been calculated in line with the prevailing national regulation and industrial practice.

The incentives from the Government of India for the renewable energy projects such as accelerated depreciation and tax holidays have been taken into consideration for the financial analysis. A salvage value of 10% has been considered in the financial analysis and is in line with the Central Electricity Regulatory Commission (CERC) guidance on renewable energy projects dated 16 September 2009 /39/.

#### 4.4.6 Investment analysis: Calculation and conclusion:

The IRR calculations and assumptions provided in a spreadsheet are consistent with the DPR of April 2006 /9/. The calculations were verified and found to be in line with EB's guidance on investment analysis /33/. In line with EB's guidance on investment analysis Para 9, interest cannot be treated as expense while calculating project IRR, however as per the Indian tax structure, interest on debt can be treated as an expense for computation of profit and tax payable thereon. Therefore for the purpose of tax computation the PP has considered the interest on debt as an expense which has been added back in the cash flow before computation of project IRR. The assumptions used in the calculations were deemed to be correct and have been verified by DNV. The project-IRR of the project over 20 years is 10.24% without the income from CERs /29/, and the project is therefore in the absence of CDM benefits not financially attractive compared to the benchmark of 12%. With CDM revenues, the project IRR improves to 12.30% /29/, which is above the benchmark.



## VALIDATION REPORT

### 4.4.7 Investment analysis: Sensitivity analysis:

A sensitivity analysis has been carried out for parameters contributing to more than 20% to revenues or costs to check the robustness of the financial analysis. Reasonable variations of the project cost, annual operation & maintenance costs, annual electricity generation and on-grid tariff were checked by calculating the variation necessary to reach the benchmark and then discussing the likelihood for that to happen. None of the parameters in the sensitivity analysis are considered to have any significant positive correlation.

**Increase in generation:** With an increase in generation by 13% (to 22.6% PLF) the project IRR becomes 12.09% and thus exceeds the benchmark adopted by the project participant. The PLF of 20% in the financial analysis is based on the average PLF in the region recommended by Maharashtra Electricity Regulatory Commission (MERC) for the purposes of tariff calculation in its tariff order dated 24 November 2003 /24/ and independent third party report (Ravi Enteck Limited, Chennai) dated August 2006 as stated in the above sections. The project activity is located in the district of Ahmednagar in Maharashtra where the observed historical PLF is 19.62% (in year 2004-05) /30/. DNV has also verified that the project proponent have installed a 17 MW wind farm in the same region in 2001-02, and the PLF obtained for the period 2002-03 to 2005-06 was 20.76%. /31/. Hence an increase of 13% in electricity generation to achieve a PLF of 22.6% is highly unlikely.

**Decrease in O & M cost:** Even after 100% decrease in the O&M costs the IRR for the project activity is lower than the benchmark return. Hence, this parameter has not been considered for the sensitivity analysis and this is deemed reasonable.

**Increase in Electricity Tariff:** The tariff considered for the project activity was based on the Maharashtra Electricity Regulation commission tariff order dated 24 November 2003 /24/. As per MERC tariff order electricity tariff is fixed at Rs.3.50/kWh with annual escalation of Rs 0.15/KWh and is valid only for 13 years. Thereafter, it is clearly stated in the tariff order that the tariff is subject to revision at the end of the period. Therefore, any assumption on the tariff applicable from 14<sup>th</sup> year onwards is uncertain.

### Assessment of accuracy of assumptions taken after year 13th

In line with the CDM Executive Board guidance on investment analysis, the IRR analysis has been done for a time horizon of 20 years in the financial calculation sheet. The tariff for the years 14 to 20 has been estimated based on a "cost-plus" approach, i.e., based on the expected operating costs incurred in year 14 and return on equity. This is the approach followed by MERC /24/, in determining tariff and is stated as:

*"The commission notes that in cost plus approach, which the commission has adopted for tariff proposal, rate per unit charged by such projects during initial period of 10 years is bound to be higher as during this period the project has various debt related obligations. However it is essential that the consumer is able to enjoy the benefit of cheaper power once all debt related obligations are paid off and project has virtually no variable costs".(Page no.14). "The rate payable gets reduced after 10 years (i.e. after repayment of loan) so that the net average cost of energy gets reduced"(Page no.135). "To ensure that developer does not*



## VALIDATION REPORT

*remove the machine after availing higher purchase rate for 10 years, an agreement may be signed allowing MSEB to have second charge for first 10 years (when the lender institution shall have first charge on the machine) and subsequently MSEB shall have first charge for the balance 10 years” (Page no.141).*

The above extracts from the tariff order of MERC /24/ indicate that the tariff will reduce after 13<sup>th</sup> year and on computation the average tariff after 13th year onwards works out to be INR 1.80 per unit. On the upside if MERC does not consider adjustment of the surplus gained, the average tariff will be INR 2.34 per unit. DNV observes that on considering the tariff of INR 2.34 per unit from the 14th year onwards, the project IRR works out to be 9.66%. Even on considering the base year tariff of INR 3.50 per unit (electricity tariff of 1<sup>st</sup> year of operation) without any annual escalation till 20 year, the project IRR only reaches to 10.24% which is still well below the applied benchmark of 12 %. Hence as a point of conservativeness base year tariff of INR 3.50/kWh from 14<sup>th</sup> to 20 year without any annual escalation till 20 year has been used while computing the project IRR. DNV confirms that there are no arithmetical inaccuracies in the calculation the project IRR computed, and hence acceptable.

**Decrease in Investment cost:** With a decrease in investment cost by 12 % the project IRR becomes 12.09% and thus exceeds the benchmark adopted by the project participant. However, in DNV’s opinion, a decrease of 12 % in investment cost is deemed not to be realistic/practical considering the fact that the project has been contracted on a turn key basis to Enercon India Limited by the project proponent Tata Power Company Limited and has been verified by DNV from purchase order /7/. In DNV’s opinion as the project has been contracted on a turn key basis, the project cost is not likely to have any increase or decrease. In the worst case scenario, there can only be an escalation in the project cost (which decreases the IRR) and not a decrease (which would increase the IRR of the project). Hence, this parameter has not been considered for the sensitivity analysis and this is deemed reasonable.

### 4.4.8 Common Practice:

Since generation of wind energy depends on local or region specific wind patterns installation of WEGs, Maharashtra has been considered for assessing the common practice. At the time of investment decision the total installed wind power capacity in Maharashtra was verified to be 1,001 MW /23/ and at the time of commissioning the installed capacity in Maharashtra was verified at 1756.38 MW /23/. As shown in a table provided in the PDD for common practice analysis till the year 2002-03, the installation of wind based power projects were at peak due to sales tax benefits of Rs. 10 million per MW per year for a period of 5 years from the date of commissioning under Maharashtra wind power policy 1998 /32/. In order to make investment in wind attractive on a stand alone basis, MERC had withdrawn the sales tax benefits from wind power projects in March 2003 /32/. Hence wind power projects installed prior to March 2003 are not considered for common practice analysis. In the period 2003-2008 a total capacity of 476 MW was added from wind projects with capacity more than 15 MW size (comparable size), and this entire 476 MW capacity is under CDM pipeline and detailed spreadsheet with CDM links of all these projects has been verified by DNV/25/.

In conclusion, it is DNV’s opinion that it has been correctly demonstrated that the project activity do not represents a common practice and thus the emission reductions achieved by the project are additional to any would happen in absence of the project.





## VALIDATION REPORT

### 4.5 Monitoring

The monitoring methodology selected complies with requirements of ACM0002, version 09 /3/. The monitoring plan will give opportunity for real measurements of achieved emission reductions.

#### 4.5.1 Parameters determined *ex-ante*

The project activity supplies electricity to the Maharashtra state electricity grid which forms a part of the western region grid of India, hence the baseline emissions from the project activity is a function of the generation mix of the western region grid of India. The selection of the western region grid of India as the grid system boundary for the project activity is in line with the EB guidance for large countries such as India. In line with the guidance provided in the “Tool to calculate the emission factor for an electricity system” /37/, the weights for OM and BM have been taken as 75:25. The combined margin emission coefficient for the western regional grid of India has been calculated at 0.940 22 tCO<sub>2</sub>e/MWh and is fixed *ex-ante* for the entire crediting period. The combined margin emission factor value has been sourced from data by the Central Electricity Authority (CEA) of the Ministry of Power, Government of India. CEA has published a database of carbon dioxide emission factors from the power sector in India based on detailed authenticated information obtained from all operating power stations in the country /8/. This CO<sub>2</sub> baseline database provides information about the OM and BM factors of all the regional electricity grids in India. DNV confirms that the CEA database version 1.1 used for calculation of combined margin emission coefficient for the western regional grid of India was latest data available at the time of the commencement of validation (inline with the requirement of “Tool to calculate the emission factor for an electricity system”) and is an official publication of the Government of India for the purpose of CDM baselines. The OM in the CEA database is calculated *ex-ante* using the simple OM approach based on the generation-weighted average emissions per electricity unit over a three year period of 2002-2003, 2003-2004 and 2004-2005 /8/. BM is calculated *ex ante* based on the 20% most recent capacity additions in the western grid based on net generation for the year 2004-05 as described in ACM0002 version 09 /3/. The operating margin has been determined to be 0.994 55 tCO<sub>2</sub>e/MWh and the build margin to be 0.7772 tCO<sub>2</sub>e/MWh /8/.

#### 4.5.2 Parameters determined *ex-post*

The net amount of electricity dispatched by the WEGs to the western regional electricity grid will be monitored continuously. The net electricity exported to the grid will be reported on monthly basis and cross-checked with the sales receipt. All data will be archived for 2 years after the crediting period. Since the project involves electricity generation from wind sources, no monitoring is required for project emissions or leakages due to the project activity.

#### 4.5.3 Management system and quality assurance

The responsibility of overall project management lies with Enercon India Limited (EIL) which is also responsible for operation and maintenance of the project activity. The joint electricity measurement will be carried out once in a month in presence of both parties (the developer’s representative and officials of the State power utility). Both parties will sign the recorded reading. The meters will be tested for accuracy and calibration of the machines would be taken care of. The monthly electricity sales receipts will also be archived until 2 years after the crediting period to facilitate crosschecking during the crediting period.



## VALIDATION REPORT

### 4.6 Estimate of GHG Emissions

The calculations are well documented in line with the consolidated baseline and monitoring methodology ACM0002, version 09 /3/. The project is electricity generation from the wind power and no project emissions and leakage is associated with the project activity. As the project activity supplies electricity to the Maharashtra state electricity grid which forms a part of the western region electricity grid, the baseline emissions has been estimated based on net electricity supplied to the grid by the project activity and combined margin emission factor of western region grid. In line with the guidance provided in the methodology, the weights for OM and BM have been taken as 75:25. The combined margin emission coefficient for the western grid of India has been calculated at 0.940 22 t CO<sub>2</sub>e/MWh and is fixed ex ante for the entire crediting period.

The project is expected to result in emission reductions of 83 022 t CO<sub>2</sub> per year during the fixed crediting period. The baseline emission estimate can be replicated using the data and parameter values provided in the PDD. The data sources mentioned have been verified by DNV. The calculations are transparently documented and verified to be correct.

### 4.7 Environmental Impacts

As per the Ministry of Environment and Forests (MoEF), India Environment Impact Notification S.O. 1533 (<http://envfor.nic.in/legis/eia/so1533.pdf>) dated 14 September 2006 wind power projects are not covered under any Schedule and thus Environmental Impact Assessment is not required for the project activity still the project proponent has conducted a rapid environmental impact assessment study for the wind power project. The project proponent has appointed Care Sustainability to conduct rapid environmental impact assessment study for the wind power project to assess the impact of the project on the local environment /13/. The project is not likely to create any adverse environmental effects. The project complies with environmental regulations in India. A detailed description of rapid environmental impact assessment study has been sufficiently discussed in PDD.

### 4.8 Comments by Local Stakeholders

The local stakeholders were invited through local newspaper advertisement in Sarvmat on 29 October 2006 /26/. The project proponent has conducted a local stakeholder meeting in Ahmednagar District on 15 November-2006 /27/. The authorities of the local administration, local communities, farmers, officials of Gram Panchayat and O & M contractor Enercon India Limited were invited to comment on project activity. A detailed description of stakeholder consultation has been provided in Appendix 2 of PDD.

### 4.9 Comments by Parties, Stakeholders and NGOs

The PDD of 15 February 2007 was made publicly available on DNV's climate change website<sup>2</sup> and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 26 Apr 07 to 25 May 07. No comments were received during this period.

The PDD of 01 August 2008 was again re-webhosted due to revision of applied version of methodology on 02 September 2008 to invited comments during a 30 days period from 03 September 2008 to 02 October 2008. Two comments were received during this period.

<sup>2</sup> [www.dnv.com/focus/climate\\_change/Projects/ProjectDetails.asp?](http://www.dnv.com/focus/climate_change/Projects/ProjectDetails.asp?)



## VALIDATION REPORT

**Comment by: Aakash Malhotra, Green Venture**

**Inserted on: 02 October 2008**

**Subject: Additionality & various other issues**

**Comments:**

1. How enercon can be a PP? Have they invested in the project? They can not become a PP as per the EB guidelines.
2. As per PDD guidelines, unique identification details should be in section A.4.1.4 and not in the appendix.
3. PO were placed in august 2006, so why webhosting in august 2008? How is the two years delay justified? What is the proof that Tata power was aware of CDM benefits? How is it being demonstrated that Tata power was aware about CDM to take such a decision at board level?
4. <http://www.projectsmonitor.com/detailnews.asp?newsid=13828> ... according to this link. Wind power is prevalent in Maharashtra and in terms of installed wind power capacity it is second in India this implies that it is common practice in the state.
5. Please check whether Tata power has considered CDM benefits in their application of loan from IREDA and ADB.
6. As per EB decision 16% benchmark is not applicable as tariff determining body can not determine the benchmark. PDD should be re-webhosted with the correct benchmark.
7. In step 1a.pp has said "(b) Setting up of comparable utility scale fossil fuel fired or hydro power projects that supply to the Maharashtra grid under a PPA." This option is not discussed further in the additionality analysis. Where has PP demonstrated that wind power is expensive than hydro or other fossil fuel? Why is hydro not a baseline? Why gas is based energy generation not a baseline?
8. <http://www.adb.org/Documents/RRPs/IND/41900-IND-RRP.pdf> according to this document, Tata already has a 17 MW wind farm in Maharashtra is this a registered project activity? If not then what is the difference between existing and proposed wind project. If 17 MW was viable without CDM funds, then this would also be viable. This link also mentions that "TPC has been assumed to supply power to distributors and bulk end consumers in the same proportion as it does now in the Mumbai license area.", so this project activity is not for only supply to the grid. Tata power will generate the higher revenues on supply to end consumers. Whether this has been considered in the IRR estimation??? This put questions on methodology applicability also.
9. The ADB report states that "Although the Project's eligibility to receive the CER revenue is still uncertain, the economic analysis incorporated the CER revenue. Even





## VALIDATION REPORT

if the Project is not entitled to the CER revenue, the same monetary amount is counted as part of the economic benefits stemming from the positive external effects on the global environment." That means project was viable without CDM revenues also...and ADB has not considered CER revenues seriously while considering and approving loans.

10. TUV NORD - Please read this link -- [http://www.mahaurja.com/PDF/MERC\\_RPS\\_ORDER\\_16-08-06.pdf](http://www.mahaurja.com/PDF/MERC_RPS_ORDER_16-08-06.pdf) --- according to this Tata Power Company is forced to install renewable energy project. THIS IS A REGULATORY REQUIREMENT. I could not imagine a company like TATA cheating the UNFCCC and the world at large. This is highly unacceptable. Where is the name and fame of TATA?? Is greed for money making TATA do anything unethical??

I will briefly explain the interpretation: "Under the renewable portfolio standard (RPS) or renewable purchase order (RPO), electricity suppliers (like TATA Power Company) are required to provide a percentage of their supply from renewable energy sources. In India 12 states have declared this green energy quota, between 2-10 per cent of total power supply.

MERC introduced RPS in Maharashtra through an August 16, 2006, order. As per this order, three utilities supplying power to Mumbai; Reliance Energy Ltd, Tata Power and Brihan Mumbai Electric Supply and Transport (best), have to buy/produce, every year, a minimum amount of renewable energy: The Percentage Specification stipulated is intended to facilitate growth of renewable energy sector and to harness renewable energy resources within the State to the maximum possible?.

In case utilities fail to meet RPS obligation, merc has specified a penalty. The Commission rules that during the first year of RPS operating framework, i.e., 2006-07, there shall not be any charge towards enforcement. However, eligible persons shall be liable to pay at the rate of Rs 5.00 per unit of shortfall in 2007-08, Rs 6.00 per unit of shortfall in 2008-09, and Rs 7.00 per unit of shortfall for 2009-10.

TUV NORD, Have you understood this??? If yes then immediately withdraw this project. And Mr. Rahul Shah, please don't cheat people. Please maintain some dignity and respect for TATA which common people has. You are not following TATA code of conduct.

It was still understandable when reliance is doing this...but not expected from TATA. You have installed wind power to escape heavy penalties, and you are under clear mandate from MERC to do so. Please don't portray something which is not true. ADB report also mentions that this project would also help TATA power meet the RPS requirement.

11. If anybody has any confusion please read this document: [http://mercindia.org.in/pdf/Ord\\_26\\_09\\_2007\\_CNo\\_04\\_of\\_2007.pdf](http://mercindia.org.in/pdf/Ord_26_09_2007_CNo_04_of_2007.pdf) ---- "Shri. J.D. Kulkarni, TPC, submitted that TPC has initiated action to set up a 100 MW wind farm



## VALIDATION REPORT

to achieve its RPS target and any shortfall in achieving the RPS target pertaining to FY 2006-07 would be adjusted during FY 2008-09, as soon as the 100 MW wind farm project is commissioned." This is a statement of TATA top management, any further clarification required, then contact me. Will give you hundred more documents.

DNV requested the project participants to respond to the issues raised in the stakeholder comment and below text box includes the response provided by the project participants.

**Response 1:** *Enercon (India) Limited and Tata Power Company Limited are project participants in the Project activity and both have been added to the Annex-1 of the PDD. Tata Power is the project owner and Enercon India Limited (EIL) is the O&M operator for the wind power project and will be responsible for monitoring, recording and archiving the data required for calculation of emission reductions from the project. Operational and management structure implemented by EIL for monitoring is detailed in section B.7.2 of the PDD.*

*Enercon (India) Limited is authorized by Tata Power to participate in the project activity as a project participant.*

*The DNA approval has been granted to both (The Tata Power Company Limited and Enercon (India) Limited) and therefore both have been added to Annex-1 of PDD.*

**Response 2:** *The unique identification details for the project activity are given in section A 4.1.4 and not in the Appendix. In addition to the unique identification detail furnished in section A.4.1.4, appendix 1 contains the location map of the project activity.*

**Response 3:** *We would like to clarify that the PDD was first web-hosted on 26 April 2007, the re-web hosting in August 2008 was done because of a version change in the applicable methodology ACM 0002, from version 6.0 to version 7.0.*

*PP's awareness about CDM can be verified from the following documents that very clearly set out the project obtaining CDM benefits.*

- *Before the investment decision Tata Power had carried out a detailed technical analysis of the feasibility of the wind power project. A copy of this detailed project report dated 3<sup>rd</sup> April 2006 has been provided to the DOE. The Project's eligibility of CDM and estimated revenues from sale of CERs was included in this analysis. Page 13 of the report contains the discussions on estimated CER revenues from the project.*
- *The CDM benefit aspect of project is also mentioned in Tata Power's Board Note dated 25<sup>th</sup> April 2006, i.e. the investment decision of the project. A copy of the Board resolution dated 29 April 2006 has been provided to the DOE.*
- *The purchase order (P.O.) for the project describes the eligibility of the project for CDM. Please refer page 5 and 6 of P.O. dated 16<sup>th</sup> August 2006.*
- *It is also to be noted that the project has been financed by Asian Development Bank, a multilateral financial institution. CDM benefits were an integral part of the project*



## VALIDATION REPORT

*appraisal carried out by ADB for extending funding for the project. A letter dated 13<sup>th</sup> February 2007 from Asian Development Bank confirming that CDM was considered in the loan appraisal stage is enclosed.*

*The project start date is 16<sup>th</sup> August 2006, immediately after start of the project, Tata power commenced discussions for appointing Enercon as the CDM consultants for the project, the formal contract for engaging Enercon was signed in November 2006. As can be seen, the PP had immediately initiated efforts to secure the CDM status of the project; the three month time taken (from start of discussions with Enercon to signing of the contract) was on account of the several commercial and legal formalities that are required to be taken care of.*

### **Chronology of Events for 50.4 MW Tata Wind Farm in Maharashtra**

<b>S. No.</b>	<b>Activities</b>	<b>Date</b>	<b>Remarks</b>
1	Detailed Project Report	3-Apr-06	Project feasibility study with the analysis for expected CDM revenue from the project.
2	Company Board Note	25-Apr-06	Investment decision has been taken along with seriously consideration of CDM revenue in the cash flow of the project.
3	Board Approval	29-May-06	Board approved the project activity with considering carbon credits benefits from the project.
4	LOI from The Tata Power Company Limited	23-Jun-06	Issued on the basis of offer received.
5	Purchase Order	16-Aug-06	About 8 Purchase Orders (PO) placed on Enercon India Limited (EIL) with consideration of CDM revenue in each PO. It is also mentioned in the POs that EIL would coordinate for development of this project as a CDM project and a separate agreement will be executed for the same between TPC and EIL.



## VALIDATION REPORT

6	<i>Communication between The Tata Power Company Limited (TPC) and EIL</i>	<i>Sep 06-Nov 06</i>	<i>Mails/letters exchanged on account of the several commercial and legal formalities that are required to be taken care of for executing the agreement between TPC and EIL for carrying out CDM project activities.</i>
7	<i>Agreement between TPC for and EIL for carrying out CDM project activities</i>	<i>30-Nov-06</i>	<i>It defines the scope of work.</i>
s8	<i>Agreement with DOE (M/s Det Norske Veritas AS)</i>	<i>Dec-06</i>	<i>Carrying out the Validation activities for the project.</i>
9	<i>Environment Impact Assessment Report (EIA) Study</i>	<i>Jan-07</i>	<i>M/s CARE Sustainability Pvt Ltd has been appointed for this purpose</i>
10	<i>Letter from project lender (Asian Development Bank)</i>	<i>13-Feb-07</i>	<i>It confirms that CDM was considered in the loan appraisal stage.</i>
11	<i>PDD web hosted under ACM 0002 Version 6</i>	<i>26 Apr 07 - 25 May 07</i>	<i>Period for receiving public comments under validation.</i>
12	<i>DNA Approval</i>	<i>25-Sep-07</i>	<i>Addressed to Enercon India Limited as Project Participant for the project activity.</i>
13	<i>Communications with DNA</i>	<i>26-Sep-07 to 17-Jan-08</i>	<i>Course of action taken for including the name of The Tata Power Company Limited as Project Participant for the project activity.</i>
14	<i>DNA Approval</i>	<i>18-Jan-08</i>	<i>Addressed to The Tata Power Company Limited as Project Participant with Enercon India Limited for the project activity.</i>
15	<i>PDD re-web hosted under ACM 0002 Version 7</i>	<i>03 Sep 08 - 02 Oct 08</i>	<i>Period for receiving public comments under validation.</i>

**Response 4:** Common practice analysis for the project type has been presented in section B.5 of the PDD which clearly demonstrates that wind power generation is insignificant when compared to the installed electricity generating capacity and generated electricity in Maharashtra.



## VALIDATION REPORT

**Response 5:** *As clarified in query no.3, the proof of consideration of CDM can be verified from multiple sources.*

- *The letter from Asian Development Bank (ADB) that clearly indicates that the CDM revenues were considered while appraising the project and the project developer was aware of the carbon revenues.*
- *The board note for investment decision making also clearly mentions the CDM eligibility aspect of the project and that the project is being executed after considering the benefits from CDM.*
- *The DPR of the report (provided to the DOE) also clearly sets out the eligibility for CDM and estimated CDM revenues from the project.*

**Response 6:** *The benchmark for the project activity has been revised in accordance with the Additionality tool and Guidance for Assessment of Investment Analysis (EB 41).*

*The project has been financed by the Indian Renewable Development Agency (IREDA), a Government of India body. IREDA, while appraising the project for loan, has employed a criterion of 12% project IRR. Therefore in accordance with Para 6(b) of the Additionality tool, the PP has used a project IRR benchmark of 12%.*

*Further, as per Para 11 of the Guidance on assessment of investment analysis (EB 41), the weighted average cost of capital (WACC) is appropriate benchmarks for a project IRR. Accordingly, the PP has computed the WACC applicable to power generation projects in India. The benchmark WACC applicable to the project works out to 13.99%, in order to be conservative a benchmark of 12% has been considered.*

*The benchmark WACC has been calculated using publicly available data, detailed Calculation for benchmark WACC and data and parameters used have been provided to the DOE for validation.*

**Response 7:** *We understand that the question basically seeks two clarifications*

- *Why the project alternatives are not discussed further?*
- *Why hydro or gas based projects are not considered as baseline?*

### ***Why the project alternatives are not discussed further?***

*The additionality tool version 5, step 2, “determine whether the proposed project activity is not the most economically and financially attractive”.*

*As per sub-step 2b of the additionality tools, the appropriate analysis method can be either investment comparison analysis (wherein IRRs of all the alternatives are compared) or benchmark analysis wherein the IRR is compared to an appropriate benchmark financial indicator. Sub-step 2c states that, if the CDM project activity has a less favourable indicator (e.g. lower IRR) than the benchmark, then the CDM project activity cannot be considered as financially attractive.*



## VALIDATION REPORT

*In light of the above, the alternatives have not been discussed further.*

### ***Why hydro and gas based projects are not considered as baseline?***

*The baseline for a project activity is determined in accordance with the applicable methodology. As per ACM0002, i.e. the applicable methodology for the project, for grid connected electricity generation activities, Grid is considered as the baseline since in the absence of the project activity electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations.*

*Accordingly, Grid has been considered as the baseline for the project.*

***Response 8:*** *The 17 MW wind power project was implemented in 2001 under the Sales tax benefit scheme and when the cost of wind turbines were significantly lower as compared to the current project activity. Therefore CDM benefits were not required for the 17 MW project.*

*The Tata Power Company as distribution licensee has a portfolio of the generating stations from which it can procure electricity for meeting the demand for its distribution area. The average power procurement price per unit is Rs. 3.14 (Please refer Page 59 of Order on TPC's ARR and Tariff Petition for FY 2005-06 and FY 2006-07 Web link: <http://www.mercindia.org.in/pdf/Order%20on%20TPC%27s%20ARR%20and%20Tariff%20Petition%20for%20FY%202005-06%20and%20FY%202006-07.pdf>), in comparison that tariff applicable to the project is Rs.3.50/kWh, clearly cost of power from the project is higher than the cost at which Tata power procures electricity. Therefore Tata Power does not draw any special economic benefit by procuring electricity from the project.*

***Response 9:*** *ADB is a multilateral financing institution committed to the cause of environment and global warming. The statement in the ADB report means that in case the even if the project is unable to generate CDM revenues, it would still continue to reduce emissions and thereby have a positive effect on the global environment.*

*Further, ADB letter dated 13 Feb 2007 confirms that the CDM revenues were considered while financing the project activity. The ADB letter having the consideration of the CDM revenues for financing the project has been provided to the validator.*

*We would like to clarify, in case the project fails to generate CDM revenues, the project will become unviable since the project IRR is lower than the benchmark.*

***Response 10:*** *Referring to the following excerpts from Annex 3 of EB-32 meeting on clarification on the consideration of National and/or sectoral policies and circumstances in baseline scenario.*

*“National and/or sectoral policies or regulations under paragraph 6 (b) that have been implemented since the adoption by the COP of the CDM M&P (decision 17/CP.7, 11 November 2001) need not be taken into account in developing a baseline scenario (i.e. the baseline scenario could refer to a hypothetical situation without the national and/or sectoral policies or regulations being in place)”.*

*It is clear that from the above extract that the RPS order is not relevant here.*





## VALIDATION REPORT

---

*The decision making process of any project involves long drawn efforts and negotiations that culminate with the board decision. In the context of this project, the activities for setting up the wind power were initiated long before even the RPS paper was published by MERC. Tata power had initiated discussions with the WEG supplier long before RPS policy of 16 August 2006 and is evident from the fact that the proposal from Enercon was received on 27 March 2006; the DoE would agree that this process does take considerable time. The DOE would also note that the DPR for the project, based on which the decision to invest in the project was taken, was finalized on 3-April-2006. A copy of the DPR has been provided to the DOE, as can be seen there is no mention of RPS in the DPR. The DOE would also note that Tata had initiated the process and had completed several activities like project evaluation, finalization of EPC supplier etc, long before 29 April 2006. It is thus clear, that the investment decision could not have been based on RPS.*

*At the time of setting up of the project there was no Renewable Procurement Obligation for Tata Power nor was there any information available to show when and how such obligation is expected or the exact nature of such obligation and its enforcing provisions.*

*To illustrate, we take the example of the current RPS: The DOE would agree that the sole enforcing provision of the RPS is the Penalty. It therefore stands to reason that if RPS were to be the reason for doing a project then the sole driver for the project would be the quantum of such penalty and the rigidity with which it is applied. At the time of project evaluation, there was no information available on this most crucial aspect of RPS and hence it could not have been considered for project evaluation. The DOE would also note that, all relevant activities for doing the project i.e. Invitation of tenders, Negotiation with EPC suppliers, DPR preparation, feasibility study and the board note preparation were initiated long before and were also completed before the RPO approach paper was even published.*

*The proposal on which the DPR was finalized was provided to Tata power by Enercon (India) Limited on 27-March-2006. At the time of setting up of the project Tata Power did not have any obligation relating to Renewable Electricity Procurement under the RPS, this is evident from the fact that RPS order came on 16 Aug 2006 long after the board has approved the investment in the project activity.*

*Further, ADB letter dated 13 Feb 2007 confirms that the CDM revenues were considered while financing the project activity. The ADB letter having the consideration of the CDM revenues for financing the project has been provided to the validator.*

*It is thus clear that it was not possible for the project proponent to evaluate a project based on RPS since there was no information available in regard to the type of commitment under RPS nor was there any information on when and how such policy would be implemented.*

**Response 11:** *The RPS order came to force on 16 Aug 2006 and the reference that is provided by the global stakeholder is from the order dated 26 Sep 2007 much after the project investment decision. Hence, it is clear that it was not possible for the project proponent to evaluate a project based on RPS since there was no information available in regard to the type of commitment under RPS nor was there any information on when and how such policy would be implemented.*

***How DNV has considered the comment received in its validation:***



## VALIDATION REPORT

---

**DNV Response 1:** In accordance with the use of the term project participant in the CDM modalities and procedures, a project participant is “(a) a Party involved, which has indicated to be a project participant, or (b) a private and/or public entity authorized by a Party involved to participate in a CDM project activity”. The Letter of Approval issued by DNA of India dated 18 January 2008 authorized both Tata Power Company Limited & Enercon (India) Limited as project participant for the CDM project activity.

**DNV Response 2:** The unique identification details for the project activity were provided in section A. 4.1.4 of the PDD; in addition to that location map of the project activity which has also been provided in appendix 1 of the PDD.

**DNV Response 3:** DNV would like to clarify that the PDD of 15 February 2007 (ACM002 Version 06) was made publicly available on DNV’s climate change website<sup>3</sup> on 25 April 2007 and Parties, stakeholders and NGOs were invited through the CDM website to provide comments during a 30 days period from 26 Apr 07 to 25 May 07. However, due to change in version of applied methodology the project design document for the project activity was again re-web hosted on 02 September 2008 to invite comments during a 30 days period from 03 September 2008 to 02 October 2008 /1/. A detailed chronology of events from start date of the project activity till project submission for validation has been included in section B. 5 of the PDD as well as section.4.4.1 of this validation report.

**DNV Response 4:** Since generation of wind energy depends on local or region specific wind patterns, installation of WEGs, in Maharashtra has been considered for assessing the common practice. At the time of investment decision the total installed wind power capacity in state of Maharashtra was 1 001 MW /23/ and the installed capacity reached to 1756.38 MW /23/ at the time of commissioning of the project activity. As provide in table for common practice analysis till the year 2002-03, the installation of wind based power projects were at peak due to sales tax benefits of INR 10 million per MW per year for a period of 5 years from the date of commissioning provided under Maharashtra wind power policy 1998, whereas in order to make investment in wind attractive on a stand alone basis MERC had withdrawn the sales tax benefits from wind power projects in March-2003. Hence wind power projects installed prior to March 2003 are not considered for common practice analysis. In the period 2003-2008 a total capacity of 476 MW was added from wind projects with capacity more than 15 MW size (comparable size), and this entire 476 MW capacity is under CDM pipeline and detailed spreadsheet with CDM links of all these projects has been verified by DNV/25/. In conclusion, it is DNV’s opinion that it has been correctly demonstrated that the project activity do not represents a common practice and thus the emission reductions achieved by the project are additional to any would happen in absence of the project.

**DNV Response 5:** As stated in the additionality section of this validation report, the chronology of the events clearly demonstrates the CDM consideration and the decisiveness of the CDM revenues for the project activity.

---

<sup>3</sup> [www.dnv.com/focus/climate\\_change/Projects/ProjectDetails.asp?](http://www.dnv.com/focus/climate_change/Projects/ProjectDetails.asp?)





## VALIDATION REPORT

---

**Response 6:** The CDM Executive Board in its 40 meeting ruled out the applicability of 16% return on equity as benchmark, which is based on tariff orders published in accordance with the Central Electricity Regulation Commission. Hence, the PP has revised the benchmark and proposed a benchmark is in line with guidance (Guidance on the Assessment of Investment Analysis:-Version 02) provided by CDM Executive Board. DNV has evaluated the benchmark proposed by project proponent and applicability of applied benchmark has been discussed in section 4.4.4 of the validation report.

DNV would also like to clarify that in re-webhosted PDD alternate benchmark was discussed, which was found to be appropriate.

**DNV Response 7:** As per applied methodology ACM0002 version 09, the baseline scenario for grid connected electricity generation activities, “Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the Tool to calculate the emission factor for an electricity system”.

Setting up of comparable utility scale fossil fuel fired project that supply power to the Maharashtra grid under a PPA will represents a scenario of capacity addition of new generation sources and is reflected in the combined margin (CM) of the grid.

As per the Guidance on the Assessment of Investment Analysis (version 02) circumstances where the baseline does not require investment or is outside the direct control of the project developer, i.e. cases where the choice of the developer has option to invest or not to invest the additionality of project can be demonstrated through benchmark analysis. In case of benchmark analysis project proponent has to demonstrate only that the implementation of project activity without CDM is less economically attractive than the selected benchmark for the project activity.

Furthermore, the “Validation and Verification Manual”, version 01, clarified that in case the applied methodology for the proposed CDM project activity prescribes the baseline scenario no further analysis is required.

**DNV Response 8:** Yes the project proponent has already implemented a 17 MW wind power project in Maharashtra but this project was implemented in 2001 under the Sales tax benefit scheme (INR. 10 million per MW per year for a period of 5 years from the date of commissioning) provided under Maharashtra wind power policy 1998, whereas in order to make investment in wind attractive on a stand alone basis MERC had withdrawn the sales tax benefits from wind power projects in March 2003. Therefore, wind capacity additions before March 2003 can not be compared with project activity.

DNV would like to clarify that the project activity was conceptualized to supply power to the grid for which the tariff has been fixed at INR.3.50/kWh with annual escalation of INR 0.15/KWh and is valid only for 13 years by Maharashtra Electricity Regulatory Commission (MERC) which is applicable for any generator for wind based electricity. Even in case Tata Power distribute this electricity in there distribution area, the final tariff for electricity distribution to consumer is regulated by MERC, hence Tata Power can not draw any additional economic benefit by even procuring electricity from the project activity.



## VALIDATION REPORT

**DNV Response 9:** It has been verified by DNV through letter from ADB dated 13 February 2007 as well as interview conducted with ADB representatives on 23 July 2009 that ADB (financial institution involved in project financing) has considered the revenue from CDM as a part of project cash flows while evaluating the project for financing. During the interview it was also clarified by ADB that the document referred to in the global stakeholder comment was an document put up to the chairman for loan appraisal in 2007 and much after the decision making process in TPC.

**DNV Response 10:** The RPS was introduced in Maharashtra on 16 August 2006<sup>4</sup> as also quoted by stakeholder, whereas process for installation of project activity was stated by Tata Power Company limited much earlier than MERC order on RPS policy this can be verified from following steps taken by project proponent:

- a) Request for quotation from Tata Power Company Limited to Enercon India limited dated: 22 March 2006 /34/.
- b) Quotation letter from Enercon India limited to Tata Power Company limited dated 27 March 2006 /28/.
- c) Detailed project report prepared by Tata Power Company Limited dated 03 April 2006 /9/.
- d) Minutes of meeting of board of directors dated 25 April, on which DPR & quotation was evaluated by board of director's /10/.
- e) Board resolution dated 29 May 2006, in which board approved the project activity as a CDM project /10/.

DNV would also like to state that RPS policy binds electricity distributors to supply certain percentage of electricity from renewable source but does not bind project proponent to generate electricity from renewable energy sources. Hence, electricity distribution companies can buy renewable energy from renewable energy generator's at a tariff rate prescribed by MERC in its tariff order dated 24 November 2003 (Rs.3.50/kWh with annual escalation of Rs 0.15/KWh and is valid only for 13 years).

As per guidance provided by CDM executive board "*National and/or sectoral policies or regulations under paragraph 6 (b) that have been implemented since the adoption by the COP of the CDM M&P (decision 17/CP.7, 11 November 2001) need not be taken into account in developing a baseline scenario (i.e. the baseline scenario could refer to a hypothetical situation without the national and/or sectoral policies or regulations being in place)*".

DNV will also like to point out that as per EB guidance on investment analysis (Para 6) all the data and parameters to be considered should be applicable at the time of investment decision making, factors emerging after the date of investment decision can not be considered for investment analysis .

**Response 11:** DNV would like to clarify that the investment decision for the project activity was taken on 29 May 2006, which is earlier than the enforcement of RPS policy whereas the report referenced in stakeholder's comment is of September 2007 which is much later than the investment decision for the project activity and as also stated above that even if Tata Power

<sup>4</sup> [http://www.mahaurja.com/PDF/MERC\\_RPS\\_ORDER\\_16-08-06.pdf](http://www.mahaurja.com/PDF/MERC_RPS_ORDER_16-08-06.pdf)



---

## VALIDATION REPORT

---

will use its 100 MW wind farm projects to meet its RPS requirement it does not have any impact on the additionality of the project as Tata Power can not draw any additional economic benefit by even procuring electricity from the project activity as final tariff to the consumers has been regulated by MERC.

**Comment by: Green, Green Venture**

**Inserted on: 02 October 2008**

**Subject: Baseline**

**Comments:** TATA already has hydro power project operational in Maharashtra. Why hydro power is not considered as baseline alternative?

***How DNV has considered the comment received in its validation:***

As per the guidance provided “*Validation and Verification Manual*”, version 01, in case the applied methodology for the proposed CDM project activity prescribes the baseline scenario no further analysis is required. ACM0002 prescribes the baseline scenario as in absence of project activity equivalent amount of electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system”.

---

## VALIDATION REPORT

---



---

## APPENDIX A

### CDM VALIDATION PROTOCOL

**Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities**

Requirement	Reference	Conclusion
<b>About Parties</b>		
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	Kyoto Protocol Art.12.2	OK
2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	<del>CAR-1</del> OK
4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	OK
5. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	OK
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	OK
9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	OK
<b>About additionality</b>		

Requirement	Reference	Conclusion
10. Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	<del>CL-3</del> <del>CL-4</del> <b>OK</b>
<b>About forecast emission reductions and environmental impacts</b>		
11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	OK
<b>About stakeholder involvement</b>		
12. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	<del>CL-6</del> <b>OK</b>
13. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	CDM Modalities and Procedures §40	OK
<b>Other</b>		
14. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
15. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM Modalities and Procedures §45c,d	OK
16. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	OK

**Table 2 Requirements Checklist**

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<b>A. General Description of Project Activity</b> <i>The project design is assessed.</i>					
<b>A.1. Project Boundaries</b> <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>					
A.1.1. Are the project's spatial boundaries (geographical) clearly defined?	/1/	DR/I	The project sites are located at Agadgaon, Devegaon, Mehekari, and Ranjani villages in Khandke Taluka in the district of Ahmednagar in state of Maharashtra, India. The unique identification of each turbine needs to be provided in the PDD.	<del>CAR 2</del>	OK
A.1.2. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/	DR/I	Yes, the project's system boundaries are defined clearly. It includes the wind energy generators and the western regional grid of India to which the generated power is despatched.		OK
<b>A.2. Participation Requirements</b> <i>Referring to Part A, Annex 1 and 2 of the PDD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.</i>					
A.2.1. Which Parties and project participants are participating in the project?	/1/	DR/I	India is the host Party for the project activity and the project participant is Enercon (India) Ltd. Is EIL is only project participant or Tata Power Company Limited is also a project	<del>CL 1</del>	OK

\* MoV : Means of verification : DR : Document review, I : Interview  
CDM Validation Protocol - Report No. 2007-1053, rev. 05

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			participant? Clarify No Annex-I country has been identified as yet.		
A.2.2. Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by an involved Party?	/1/ /2/	DR/I	Host country India is yet to provide the letter of approval in addition to the authorization to the project participant. Host Country Approval letter needs to be provided for verification.	<del>CAR-1</del>	OK
A.2.3. Do all participating Parties fulfil the participation requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated a National Authority	/1/ /2/	DR/I	India fulfils the participation requirements, having ratified the Kyoto Protocol on the 26 August 2002 and has established a DNA - National Clean development Mechanism Authority, Ministry of Environment and Forests (MoEF). The voluntary participation of the project needs to be confirmed against the letter of approval from the DNA.	<del>CAR-1</del>	OK
A.2.4. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance.	/1/	DR/I	No public funding from any Annex-I country has been received.		OK
<b>A.3. Technology to be employed</b> <i>Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.</i>					
A.3.1. Does the project design engineering reflect	/1/	DR/I	The WEGs installed under the project has		OK

\* MoV : Means of verification : DR : Document review, I : Interview  
CDM Validation Protocol - Report No. 2007-1053, rev. 05



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
current good practices?			been designed and commissioned by Enercon India Limited. EIL is reputed firm in the field of wind energy. The salient features of the E-48 models implemented under the project activity include gearless construction, variable speed and pitch functions and independent braking technology. The project design thus reflects good practice.		
A.3.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/	DR/I	The E-48 models used in the project are likely to result in significantly better performance than the commonly used WEGs in India.		OK
A.3.3. Does the project make provisions for meeting training and maintenance needs?	/1/	DR/I	The project will require some initial training and maintenance efforts for proper operation. The operation and maintenance of the WEGs have been taken care by EIL. This ensures proper maintenance and operation of the WEGs during the crediting period.		OK
<b>A.4. Contribution to Sustainable Development</b> <i>The project's contribution to sustainable development is assessed.</i>					
A.4.1. Has the host country confirmed that the project assists it in achieving sustainable development?	/1/ /2/	DR/I	The letter of approval from the DNA confirming that the project assists in achieving sustainable development needs to be submitted.	<del>CAR-1</del>	OK
A.4.2. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR/I	The project will help to decrease the dependence on fossil fuels for power generation. The project activity will create employment		OK

\* MoV : Means of verification : DR : Document review, I : Interview  
CDM Validation Protocol - Report No. 2007-1053, rev. 05

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			opportunities during construction and also operation phases.		
<b>B. Project Baseline</b> <i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>					
<b>B.1. Baseline Methodology</b> <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
B.1.1. Does the project apply an approved methodology and the correct version thereof?	/1/ /3/	DR/I	Yes. The approved methodology ACM0002 Version 06 (19 May 2006) "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" has been applied, which was pertinent at the time of web-hosting the PDD. PP is requested to apply version latest version of the methodology as the project is not likely to be registered in version 06.	<b>CAR-6</b>	OK
B.1.2. Are the applicability criteria in the baseline methodology all fulfilled?	/1/ /3/ /8/	DR/I	Yes, the project activity meets the applicability criteria of ACM0002 and is justified as under : <ul style="list-style-type: none"> <li>The project activity involves an electricity capacity addition from a renewable source (wind based) providing power to the western regional grid.</li> <li>The geographic and system boundaries for the relevant electricity grid have been clearly identified to be the western</li> </ul>		OK

\* MoV : Means of verification : DR : Document review, I : Interview  
CDM Validation Protocol - Report No. 2007-1053, rev. 05

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			electricity grid. The project activity will displace fossil fuel based electricity that would otherwise be provided by the operation and expansion of the western regional grid and sufficient information on the characteristics of the grid are available.		
<b>B.2. Baseline Scenario Determination</b> <i>The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.</i>					
B.2.1. What is the baseline scenario?	/1/ /3/	DR/I	The baseline scenario is the continuation of current scenario, i.e. the electricity displaced by the project would have been by the generated by the operation of grid-connected power plants and by the addition of new generation sources in the western regional grid of India.		OK
B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/ /3/ /4/	DR/I	Other than the baseline scenario, the option of setting up a fossil fuel based power plant or hydro power plant and project without CDM benefits have been discussed. However, coal based power plant option has not been considered as the baseline since this option would have required considerable amount of investment as compared to the baseline which do not require any investment at all. Also this option would have led to	<del>CAR-5</del>	OK

\* MoV : Means of verification : DR : Document review, I : Interview  
CDM Validation Protocol - Report No. 2007-1053, rev. 05

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			<p>higher amount of emissions in the baseline. Also, the option of project without CDM has not been considered due to the presence of several barriers discussed later. Thus the selected baseline scenario is the most likely scenario in the absence of the project.</p> <p>Even if installation of fossil fuel fired power project is baseline scenario how continuation of existing practice as alternative to the baseline scenario (as per ACM0002) can be ruled.</p> <p>As it is clearly stated in ACM0002 that in absence of project activity project proponent would have installed a grid connected fossil fuel fired power plant this scenario represents a situation that equivalent amount of electricity would have been otherwise generated by the operation of grid connected power plants &amp; by the addition of new generation sources (reflected in CM calculation).</p>		
B.2.3. Has the baseline scenario been determined according to the methodology?	/1/	DR/I	Please refer to earlier comments.	<del>CAR-5</del>	OK
B.2.4. Has the baseline scenario been determined using conservative assumptions where possible?	/1/ /3/	DR/I	Please refer to earlier comments.	<del>CAR-5</del>	OK
B.2.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR/I	Yes, relevant national and sectoral policies have been taken into account.		OK

\* MoV : Means of verification : DR : Document review, I : Interview  
 CDM Validation Protocol - Report No. 2007-1053, rev. 05

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.2.6. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/ /8/	DR/I	Yes. The Baseline emission factor has been chosen from official web site of Central Electricity Authority which is publicly available data.		OK
B.2.7. Have the major risks to the baseline been identified?	/1/	DR/I	Please refer section B.2.2.	<del>CAR-5</del>	OK
<b>B.3. Additionality Determination</b> <i>The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.</i>					
B.3.1. Is the project additionality assessed according to the methodology?	/1/ /4/ /5/ /6/ /7/ /9/ /10/ /11/ /12/ /14/ /15/ /16/ /17/ /18/ /19/ /20/	DR/I	Yes, the project's additionality is demonstrated using "Tool for the demonstration and assessment of additionality", version 02.  <b>Step 0:</b> Since the project activity does not seek for retro active credits, this step is not applicable to the project activity. However, the project proponent is requested to present the proof of CDM consideration.  <b>Step 1:</b> Three alternatives to the project activity have been considered as the baseline scenario. These are i) project not undertaken as a CDM project activity ii) Setting up of equivalent capacity of fossil fuel or hydro power based plants and supply electricity to the Maharashtra grid and ii) continuation of current scenario without the project activity.	<del>CL-3</del> <del>CL-4</del> <del>CAR-7</del>	OK

\* MoV : Means of verification : DR : Document review, I : Interview  
CDM Validation Protocol - Report No. 2007-1053, rev. 05

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	/21/ /22/ /23/ /24/ /25/ /26/ /27/ /28/ /29/ /30/ /31/ /32/ /33/		<p>All the alternatives are in compliance with the laws and regulations of India. For considering the baseline emissions the continuation of power generation from existing and future grid connected power plants have been selected as the baseline since this option results in lower baseline emissions than the coal based power plant option.</p> <p><b>Step 2: Investment analysis:</b></p> <p>To demonstrate the additionality of the project, EIL have chosen Option III – benchmark analysis.</p> <p>The benchmark chosen is the post tax return on equity of 16% as stated for the state of Maharashtra in the Rajasthan Electricity Regulatory Commission order dated 18 January 2005.</p> <p>Why MERC order is not taken as reference?</p> <p>It has been demonstrated that the equity IRR of the project activity without CDM revenues is 10.16% which is lower than the benchmark equity IRR of 16% for independent power producers (IPP) as per KERC order. The IRR improves to 13.31 % with CDM revenues.</p> <p>A sensitivity analysis has also been performed with <math>\pm 5\%</math> change in PLF. And have shown that the equity IRR is less than 16%.</p>		

\* MoV : Means of verification : DR : Document review, I : Interview  
 CDM Validation Protocol - Report No. 2007-1053, rev. 05

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			<p>The financial spread sheet calculations need to be provided for verification.</p> <p><b>Step 3:</b> Not chosen.</p> <p><b>Step 4:</b> Common practice analysis: This as been demonstrated on the fact that as per the data the energy generation by wind power plants in 2004-05 was 495.36 GWh as against the total generation of 82075.33 GWh. This works out to be around 0.6% and cannot be considered as a common practice scenario in the region. Apart from that it as been demonstrated that as on 31 March 2005 of the total 411.2 MW wind power projects established in Maharashtra.</p> <p>Source needs to be provided for the above information.</p> <p><b>Step 5:</b> Impact of CDM registration: The CDM benefits increase the equity IRR of the project by 3.15% thus providing the project with necessary financial back-up.</p> <p>However, to conclude on the additionality, the following is requested:</p> <ul style="list-style-type: none"> <li>• IRR and sensitivity analysis detail Justification / work sheet to be provided.</li> <li>• PLF consideration should be justified. <ul style="list-style-type: none"> <li>• What are the incentives offered by the Government of Maharashtra? Have these been considered in the financial</li> </ul> </li> </ul>		

\* MoV : Means of verification : DR : Document review, I : Interview  
CDM Validation Protocol - Report No. 2007-1053, rev. 05



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			analysis? <ul style="list-style-type: none"> <li>PPA should be furnished.</li> </ul> All statutory clearances need to be provided for verification. Project proponent is requested to use latest "Tools for demonstration and assessment of additionality". Version 05.2		
B.3.2. Are all assumptions stated in a transparent and conservative manner?	/1/ /15/ /16/ /17/ /18/ /19/ /20/	DR/I	Clarifications Pending from B.3.1	<del>CL-4</del>	OK
B.3.3. Is sufficient evidence provided to support the relevance of the arguments made?	/1/ /15/ /16/ /17/ /18/ /19/ /20/	DR/I	Clarifications Pending from B.3.1	<del>CL-4</del>	OK
B.3.4. If the starting date of the project activity is before the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?	/1/ /7/ /9/ /10/ /11/ /12/	DR/I	The starting date of the project activity is August 16th 2006 (Date of purchase order) and it is before the start date of validation. Proof of start date of the project activity needs to be provided for verification. Since start date of the project activity is prior to the start of validation, project proponent is	<del>CL-2</del>  <del>CL-5</del>	OK

\* MoV : Means of verification : DR : Document review, I : Interview  
CDM Validation Protocol - Report No. 2007-1053, rev. 05

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	/13/		<p>requested to demonstrate CDM Consideration as per EB 41 Annexure 46 and evidence for the same need to be provided for verification.</p> <ul style="list-style-type: none"> <li>• Project Proponent was aware about CDM prior to start date of project activity.</li> <li>• CDM was a decisive factor to go ahead with the project activity.</li> <li>• Continuous serious actions were taken by project proponent in order to achieve CDM revenue.</li> </ul>		
<b>B.4. Calculation of GHG Emission Reductions – Project emissions</b> <i>It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.4.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR/I	The project being a wind energy generation project, there are no emissions from the project activity.		OK
<b>B.5. Calculation of GHG Emission Reductions – Baseline emissions</b> <i>It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.5.1. Are the calculations documented according to the	/1/	DR/I	The calculation of the baseline emissions has		OK

\* MoV : Means of verification : DR : Document review, I : Interview  
 CDM Validation Protocol - Report No. 2007-1053, rev. 05

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
approved methodology and in a complete and transparent manner?	/8/		been done in a transparent manner. Electricity generation by the existing grid connected power plants have been selected as the baseline. The baseline emission factor has been calculated as a combination of OM and BM emission factors and it is fixed <i>ex-ante</i> . The OM and BM emission factors have been sourced from the published data of CEA. The combined margin for the western regional grid has been determined to be 0.94022 t CO <sub>2</sub> /MWh.		
B.5.2. Have conservative assumptions been used when calculating the baseline emissions?	/1/ /8/	DR/I	Yes, conservative assumptions have been used for calculating the emission reductions.		OK
B.5.3. Are uncertainties in the baseline emission estimates properly addressed?	/1/ /6/	DR/I	The uncertainty in the baseline emissions arise due to the variation of the PLF of the project from the assumed PLF of 20%. However since the actual electricity generation will be monitored ex-post, this uncertainty will be taken care of.		OK
<b>B.6. Calculation of GHG Emission Reductions – Leakage</b> <i>It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.6.1. Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR/I	The project being a wind energy generation project, there are no leakages due to the project activity.		OK

\* MoV : Means of verification : DR : Document review, I : Interview  
 CDM Validation Protocol - Report No. 2007-1053, rev. 05

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<b>B.7. Emission Reductions</b> <i>The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.</i>					
B.7.1. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.	/1/	DR/I	Yes, the emission reductions are real and measurable. The project will reduce 83022 tCO <sub>2</sub> e emissions per annum over the 10 years crediting period.	<del>CAR-8</del>	OK
<b>B.8. Monitoring Methodology</b> <i>It is assessed whether the project applies an appropriate monitoring methodology.</i>					
B.8.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/1/ /3/	DR/I	Yes, the monitoring plan documented according to the approved baseline & monitoring methodology ACM 002 and is complete and transparent.  The net amount of electricity despatched by the WEGs to the western regional electricity grid will be monitored continuously.		OK
B.8.2. Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/1/	DR/I	PDD does not mention about the period for which the monitored data will be archived. The same may be added in the monitoring plan.	<del>CAR-3</del>	OK
<b>B.9. Monitoring of Project Emissions</b> <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
B.9.1. Does the monitoring plan provide for the collection and archiving of all relevant data	/1/	DR/I	There are no emissions from the project		OK

\* MoV : Means of verification : DR : Document review, I : Interview  
 CDM Validation Protocol - Report No. 2007-1053, rev. 05

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?			activity since this is a renewable energy generation project.		
<b>B.10. Monitoring of Baseline Emissions</b> <i>It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.</i>					
B.10.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR/I	Yes, the monitoring plan provides for the monitoring and collection of the net electricity supplied to the grid. This is the only parameter that will be required for calculating the baseline emissions.		OK
B.10.2. Are the choices of baseline GHG indicators reasonable and conservative?	/1/	DR/I	CO <sub>2</sub> is the only relevant baseline indicator and it has been accounted for.		OK
B.10.3. Is the measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/1/	DR/I	The net amount of electricity despatched by the WEGs to the grid will be monitored continuously.		OK
B.10.4. Is the measurement <i>equipment</i> described and deemed appropriate?	/1/	DR/I	The electricity meters installed are two way meters measuring both imports as well as export and in the custody of the Maharashtra State Electricity Board. The meters are deemed appropriate.		OK
B.10.5. Is the measurement <i>accuracy</i> addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR/I	Yes the accuracy class & QA/QC procedures has been defined in the PDD. The net electricity exported to the grid can be cross checked against the sales invoices raised to State Electricity Board.		OK

\* MoV : Means of verification : DR : Document review, I : Interview  
CDM Validation Protocol - Report No. 2007-1053, rev. 05

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.10.6. Is the measurement <i>interval</i> for baseline data identified and deemed appropriate?	/1/	DR/I	Yes, The net electricity supplied will be measured on continuous basis & will be recorded once in a month, kWh reading will be recorded and documents will be maintained.		OK
B.10.7. Is the registration, <i>monitoring, measurement and reporting</i> procedure defined?	/1/	DR/I	Yes.		OK
B.10.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR/I	Maintenance procedures for the monitoring equipments and the installation need to be addressed in the PDD.  Yes, the meters will be calibrated periodically, if there is any difference between the main and check meter readings.	<del>CAR-3</del>	OK
B.10.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR/I	Procedures for day-to-day record handling need to be established, address the type of records to be stored, the storage area, etc.	<del>CAR-3</del>	OK
<b>B.11. Monitoring of Leakage</b> <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>					
B.11.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR/I	Leakage monitoring is not required for this project activity.		OK
<b>B.12. Monitoring of Sustainable Development Indicators/ Environmental Impacts</b> <i>It is assessed whether choices of indicators are reasonable</i>					

\* MoV : Means of verification : DR : Document review, I : Interview  
CDM Validation Protocol - Report No. 2007-1053, rev. 05

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<i>and complete to monitor sustainable performance over time.</i>					
B.12.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/	DR/I	The DNA of India does not mandate the monitoring of sustainable development indicators.		OK
<b>B.13. Project Management Planning</b> <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
B.13.1. Is the authority and responsibility of overall project management clearly described?	/1/	DR/I	No project proponent is requested to define the authority and responsibility of the project management in the monitoring plan of the PDD. Clarify on the Authority EIL or Tata Power Company Limited.	<del>CL-1</del>	OK
B.13.2. Are procedures identified for training of monitoring personnel?	/1/	DR/I	Training procedures need to be identified and addressed in the PDD.	<del>CAR-3</del>	OK
B.13.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR/I	No emergencies due to the project activity will lead to unintended GHG emissions.		OK
B.13.4. Are procedures identified for review of reported results/data?	/1/	DR/I	Yes. EIL will be responsible for the review of reported results.		OK
B.13.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR/I	Yes, This has been identified in the PDD.		OK

\* MoV : Means of verification : DR : Document review, I : Interview  
CDM Validation Protocol - Report No. 2007-1053, rev. 05



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<b>C. Duration of the Project/ Crediting Period</b> <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>					
C.1.1. Are the project's starting date and operational lifetime clearly defined and evidenced?	/1/	DR/I	The starting date of the project has been identified as 16 August 2006 which is the date of purchase order placed for the project activity. The lifetime of the project has been identified as 20 years. This is deemed reasonable.  Documentary evidence for the project start date need to be provided.	<del>CL-5</del>	OK
C.1.2. Is the start of the crediting period clearly defined and reasonable?	/1/	DR/I	The project selects a fixed crediting period of 10 years starting from 1stOctober 2007.	<del>CAR-4</del>	OK
<b>D. Environmental Impacts</b> <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					
D.1.1. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/	DR/I	The project does not require an environmental impact analysis as per the EIA notification of the MoEF.		OK
D.1.2. Will the project create any adverse environmental effects?	/1/	DR/I	The project is not likely to create any adverse environmental effects.		OK
D.1.3. Are transboundary environmental impacts considered in the analysis?	/1/	DR/I	There are no trans-boundary impacts of the project activity.		OK

\* MoV : Means of verification : DR : Document review, I : Interview  
CDM Validation Protocol - Report No. 2007-1053, rev. 05

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
D.1.4. Have identified environmental impacts been addressed in the project design?	/1/	DR/I	There no negative environmental impacts due to the project.		OK
D.1.5. Does the project comply with environmental legislation in the host country?	/1/	DR/I	The project complies with environmental regulations in India. The project has obtained necessary licences and environmental clearances.		OK
<b>E. Stakeholder Comments</b> <i>The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.</i>					
E.1.1. Have relevant stakeholders been consulted?	/1/	DR/I	The employees, contractual labours, & the villagers have been consulted.		OK
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR/I	A local news paper advertisement was placed inviting the stakeholders and a meeting of the local representatives was conducted on 15th Nov 2006. Proof need to be furnished.	<del>CL-6</del>	OK
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR/I	A stakeholder consultation is not required by the DNA of India.		OK
E.1.4. Is a summary of the stakeholder comments received provided?	/1/	DR/I	The project proponent is requested to provide a summary of the comments received in the PDD.	<del>CL-6</del>	OK
E.1.5. Has due account been taken of any stakeholder comments received?	/1/	DR/I	The project did not receive any negative		OK

\* MoV : Means of verification : DR : Document review, I : Interview  
CDM Validation Protocol - Report No. 2007-1053, rev. 05

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			comment.		

**Table 2b Additional Requirements Checklist**

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<b>A.5. Letter of approval</b>					
A.1.1 Is the LoA received directly from the DNA or through the project participant.	/1/ /2/	DR/I	The LoA has been provided by the project proponent and original copy of the same has been witnessed during site visit.		OK
<b>A.6. Project design</b>					
A.2.1 Does the PDD describe the CDM project activity with all relevant elements in a transparent and accurate way?	/1/	DR	Yes, the CDM project activity has been described adequately in the CDM PDD.		OK
A.2.2 Has the CDM project activity at the start of the validation been constructed or does the CDM project activity use existing facilities or equipment?	/1/	DR/I	No, the CDM project activity was not commissioned at the start of the validation process. The project activity is installation of new wind energy generators.		OK
A.2.3 Is the project a large scale project, a small scale project with average annual emission reductions above 15 000 tonnes or a bundled small scale project? Has on-site visit been carried out?	/1/	DR/I	Yes project is a large scale project activity. Yes, a site visit has been carried out on 26 June 2008.		OK
A.2.4 Does the project activity involved alteration of existing installations? If so, have the differences between pre-project and post-project activity been clearly described in the PDD?	/1/	DR/I	The project activity is installation of new wind energy generators.		OK
<b>A.7. Project emissions not addressed by the methodology</b>					
A.3.1 Does the methodology describe all project	/1/	DR	NA		OK

\* MoV : Means of verification : DR : Document review, I : Interview  
 CDM Validation Protocol - Report No. 2007-1053, rev. 05

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
emission source for the project activity that contributes all 1% of the emission reductions? Sources that the methodology considers not to take into account are not relevant (e.g. cement and iron consumption for building hydropower plants).	/3/				
<b>A.8. Documentation of baseline emissions</b>					
<b>A.4.1 Documentation of the baseline determination:</b> <ol style="list-style-type: none"> <li>All assumptions and data used by the project participants are listed in the PDD and related document to be submitted for registration. The data are properly referenced.</li> <li>All documentation is relevant as well as correctly quoted and interpreted.</li> <li>Assumptions and data can be deemed reasonable</li> <li>Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD.</li> <li>The methodology has been correctly applied to identify what would occurred in the absence of the proposed CDM project activity</li> </ol>	/1/ /3/	DR	Yes, refer section B.2 of the validation Table:2		OK
<b>A.9. Documentation of the calculations</b>					
<b>A.5.1 Algorithms and/or formulae used to determine emission reductions</b> <ul style="list-style-type: none"> <li>All assumptions and data used by the project participants are listed in the PDD and related document submitted for registration. The data are properly referenced</li> <li>All documentation is correctly quoted and interpreted.</li> </ul>	/1/ /3/	DR	Yes, refer section B.4, B.5, B.6 & B.7 of the validation Table:2		OK

\* MoV : Means of verification : DR : Document review, I : Interview  
 CDM Validation Protocol - Report No. 2007-1053, rev. 05

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<ul style="list-style-type: none"> <li>All values used can be deemed reasonable in the context of the project activity</li> <li>The methodology has been correctly applied to calculate the emission reductions and this can be replicated by the data provided in the PDD and supporting files to be submitted for registration.</li> </ul>					

\* MoV : Means of verification : DR : Document review, I : Interview  
 CDM Validation Protocol - Report No. 2007-1053, rev. 05

**Table 3 Resolution of Corrective Action and Clarification Requests**

<b>Draft report clarifications and corrective action requests by validation team</b>	<b>Ref. to checklist question in table 2</b>	<b>Summary of project owner response</b>	<b>Validation team conclusion</b>
<b>CAR 1:</b> Host Country Approval letter must be provided for verification.	A.2.2 A.2.3 A.4.1	<ul style="list-style-type: none"> <li>Host Country approval has been provided to DOE</li> </ul>	<p>Letter of Approval from DNA of India dated 18 January 2008 has been verified by DNV.</p> <p>OK Accepted.</p> <p>CAR 1 Closed.</p>
<b>CAR 2:</b> Unique identification number of the turbines needs to be provided in the PDD.	A.1.1	<ul style="list-style-type: none"> <li>Unique Identification number is incorporated in the revised PDD.</li> </ul>	<p>Necessary changes have been incorporated in revised PDD version 06.</p> <p>Revised PDD has been reviewed by DNV.</p> <p>OK Accepted.</p> <p>CAR 2 Closed.</p>
<b>CAR 3:</b> The medium of storage of monitored data (power fed to the grid) and the duration for which they will be kept available needs to be specified. The training procedures need to be addressed in the PDD. Day-to-day handling procedures need to be mentioned in the PDD.	B.8.2 B.10.8 B.10.9 B.13.2	<ul style="list-style-type: none"> <li>The medium for storage of monitoring data and the period for which they will be archived is detailed in section B.7.1 of the revised PDD.</li> <li>Enercon has a well-established training academy that provides proper training to its personals to be able to handle and manage regular operations and maintenance and emergencies relating to the wind turbine equipment and the ancillary services of the wind farm.</li> <li>Training procedure has been detailed under</li> </ul>	<p>Necessary procedure for training, data archive &amp; day to day handling of records has been incorporated in revised PDD version 06.</p> <p>Revised PDD has been reviewed by DNV.</p> <p>OK Accepted.</p> <p>CAR 3 Closed.</p>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		<p>section B.7.2 of the revised PDD.</p> <ul style="list-style-type: none"> <li>• Enercon is an ISO certified company and the service department, which is responsible for activities, related to monitoring of the data for the CDM project is covered under the ISO certification. The procedure for day to day handling of records would be as per its ISO manual.</li> </ul>	
<p><b>CAR 4:</b> Start date of the crediting period date should be revised.</p>	C.1.2	<ul style="list-style-type: none"> <li>• Start date of the crediting period has been changed in the revised PDD.</li> </ul>	<p>Necessary changes have been incorporated in revised PDD version 06. Revised PDD has been reviewed by DNV. OK Accepted. CAR 4 Closed.</p>
<p><b>CAR 5</b> As per the applied methodology ACM0002, if the project activity is the installation of a new grid-connected renewable power plant/unit the baseline scenario should be the continuation of existing practice (equivalent amount of electricity would have been otherwise generated by the operation of grid connected power plants &amp; by the addition of new generation sources, reflected in CM calculation).</p>	<p>B.2.2 B.2.3 B.2.4 B.2.7</p>	<p>The continuation of the current situation in reference to the additionality tool implies that there is no project activity or any other alternatives taken. Considering the present situation of the grid, there is energy shortage which will imply that the grid will continue to grow and the new generating stations will continue to fill the demand-supply gap. Therefore in near future, continuation of situation where no power generating station is added [no project activity or other alternatives taken] is not</p>	<p>Alternative scenario to the project activity has been corrected now in revised PDD version 06. Two alternatives to the project activity have been considered as the baseline scenario. These are i) project activity without CDM benefits and ii) continuation of current scenario of power generation from existing grid-connected</p>



Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>As per the guidance provided in latest VVM (Para 81) methodology always takes a precedence over the various tools that are to be used.</p> <p>it is observed that PP has identified two alternatives to the project activity, these being</p> <p><b>A)</b> Project not undertaken as a CDM project activity.</p> <p><b>B)</b> Setting up of comparable utility scale fossil fuel fired or hydro power projects that supply to the Maharashtra grid under a PPA</p> <p>It needs to be justified in the PDD why alternative B can not be considered as baseline alternative if Maharashtra has a power deficit scenario (refer statement made below alternative B Page 11 of PDD).</p> <p>PP is requested to discuss installation of fossil fuel fired and installation of hydro based power project separately as alternative to the project activity (as both alternative can not be eliminated based on common justification (benchmark Analysis) provided in the PDD).</p> <p>if installation of fossil fuel fired or hydro based power project is considered as baseline scenario:</p>		<p>plausible. Henceforth, continuation of the current situation is considered as non-plausible and is not included in the plausible alternatives.</p> <p>We understand that the question basically seeks two clarifications</p> <ul style="list-style-type: none"> <li>- Why the project alternatives are not discussed further?</li> <li>- Why hydro or gas based projects are not considered as baseline?</li> </ul> <p><b>Why the project alternatives are not discussed further?</b></p> <p>The additionality tool version 5, step 2, “determine whether the proposed project activity is not the most economically and financially attractive”.</p> <p>As per sub-step 2b of the additionality tools, the appropriate analysis method can be either investment comparison analysis (wherein IRRs of all the alternatives are compared) or benchmark analysis wherein the IRR is compared to an appropriate benchmark financial indicator. Sub-step 2c states that, if the CDM project activity has a less favorable indicator (e.g. lower IRR) than</p>	<p>power plants. Both alternatives are in compliance with the laws and regulations of India and might be considered as baseline scenarios.</p> <p>Justification for eliminating project activity without CDM benefits has been discussed in section B.5 of the revised PDD version 06.</p> <p>Revised PDD version 06 has been reviewed by DNV.</p> <p>OK Accepted. CAR 5 Closed.</p>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>a) PP is requested to demonstrate that this scenario is more economically attractive than project activity.</p> <p>b) Even if installation of fossil fuel fired power project is baseline scenario how continuation of existing practice as alternative to the baseline scenario (as per ACM0002) can be ruled.</p> <p>As it is clearly stated in ACM0002 that in absence of project activity project proponent would have installed a grid connected fossil fuel fired power plant this scenario represents a situation that equivalent amount of electricity would have been otherwise generated by the operation of grid connected power plants &amp; by the addition of new generation sources (reflected in CM calculation).</p>		<p>the benchmark, then the CDM project activity cannot be considered as financially attractive.</p> <p>In light of the above, the alternatives have not been discussed further.</p> <p><b>Why hydro and gas based projects are not considered as baseline?</b></p> <p>The baseline for a project activity is determined in accordance with the applicable methodology. As per ACM0002, i.e. the applicable methodology for the project, for grid connected electricity generation activities, Grid is considered as the baseline since in the absence of the project activity electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations. Accordingly, Grid has been considered as the baseline for the project.</p>	
<p><b>CAR 6</b></p> <p>Project proponent is requested to apply latest version of the methodology as the project is</p>	B.1.1	The PDD has been revised to ACM002 Version 09.	Necessary changes have been incorporated in the revised PDD.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
not likely to be registered in version 07.			Revised PDD has been reviewed by DNV. OK Accepted CAR 6 Closed.
<b>CAR 7</b> Project proponent is requested to use latest “Tools for demonstration and assessment of additionality”. Version 05.2	B.3.1 B.3.2 B.3.3	The PDD has been revised to latest tool to demonstrate additionality version 05.2.	Necessary changes have been incorporated in the revised PDD. Revised PDD has been reviewed by DNV. OK Accepted. CAR 7 Closed.
<b>CAR 8</b> PP is requested to use the combined margin grid emission factor of western regional grid of India applicable at the time of start of the validation.	B.7.1	The PDD has been revised and the the combined margin grid emission factor of western regional grid of India applicable at the time of PDD submission for validation has been now used for emission reduction calculation. Revised PDD enclosed.	Project proponent has revised the value of combined margin grid emission factor of western regional grid of India and now combined margin grid emission factor of western regional grid applicable at the time of start of the validation has been used for emission reduction estimation. This is inline with the requirement of tool to calculate the emission factor for an electricity system. OK Accepted. CAR 8 Closed.
<b>CL 1:</b>	A.2.1	• EIL and the Tata Power Company Limited	EIL & Tata Power Company

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>Is EIL is only project participant or Tata Power Company Limited is also a project participant? Clarify</p> <p>Management structure and Section D.1 in the PDD needs to be clarified in case Tata Power Company Limited is also PP for the project activity.</p> <p>Annex I – Clarify</p>	B.13.1	<p>both are project participants in the Project activity and both the parties have been added to the Annex-1 of the PDD.</p> <ul style="list-style-type: none"> <li>• All activities relating to communication with UNFCCC and request for forwarding of CERs shall be the responsibility of The Tata Power Company Limited.</li> <li>• Enercon India Limited (EIL) is the O&amp;M operator for the wind power project and will be responsible for monitoring, recording and archiving the data required for calculation of emission reductions from the project. Operational and management structure implemented by EIL for monitoring is detailed in section B.7.2 of the PDD.</li> <li>• The above description has been included in section A.3 of the revised PDD.</li> </ul>	<p>Limited both are project participants for the project activity.</p> <p>Tata Power Company Limited has authorized Enercon (India) Limited to participate in a CDM project activity as a project participant viz: authorisation letter issued by Tata Power Company Limited and same has been verified by DNV.</p> <p>PDD has been corrected now &amp; detailed Operation and management structure for monitoring has been included in section B.7.2 of the revised PDD version 06.</p> <p>OK Accepted CL 1 Closed.</p>
<p><b>CL2:</b></p> <p>Proof of CDM consideration needs to be provided.</p> <p>CL 2 Pending:</p> <p>Project proponent is requested to demonstrate CDM Consideration as per EB 41 Annexure</p>	B.3.4	<ul style="list-style-type: none"> <li>• Following documents are provided as proof for the consideration of CDM:               <ol style="list-style-type: none"> <li>1. Detailed Project Note</li> <li>2. Board Note</li> <li>3. Letter from lending Institution</li> </ol> </li> </ul> <p>The purchase order has been submitted to DOE</p>	<p>Following evidences to substantiate that CDM was seriously considered prior to start date of project activity has been verified by DNV.</p> <p>Detailed project report of April 2006.</p>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>46 and evidence for the same need to be provided for verification.</p> <ul style="list-style-type: none"> <li>• Project Proponent was aware about CDM prior to start date of project activity.</li> <li>• CDM was a decisive factor to go ahead with the project activity.</li> </ul> <p>Continuous serious actions were taken by project proponent in order to achieve CDM revenue.</p>		<p>as a proof for the start date of the project activity.</p> <p>We would like to clarify that the PDD was first web-hosted on 26 April 2007, the re-web hosting in August 2008 was done because of a version change in the applicable methodology ACM 0002, from version 6.0 to version 7.0.</p> <p>PP's awareness about CDM can be verified from the following documents that very clearly set out the project obtaining CDM benefits.</p> <ul style="list-style-type: none"> <li>- Before the investment decision Tata Power had carried out a detailed technical analysis of the feasibility of the wind power project. A copy of the report dated 3-April-2006 has been provided to the DOE. The Project's eligibility of CDM and estimated revenues from sale of CERs was included in this analysis. Page 12 of the report contains the discussions on estimated CER revenues from the project.</li> <li>- The CDM benefit aspect of project is also mentioned in Tata Power's Board note dated 25-April-2006, i.e. the investment decision of the project. A</li> </ul>	<p>Minutes of meeting of board of directors meeting dated 25 April &amp; 29 May 2006.</p> <p>Purchase order placed on 16 April 2006.</p> <p>Letter from ADB (financial institution involved in project financing) dated 13 February 2007 that ADB has also considered the revenue from CDM as a part of project cash flows.</p> <p>Appointment of EIL as CDM consultants on 11 September 2006 to undertake the project as a CDM activity.</p> <p>Contract with EIL dated 30 November 2006.</p> <p>Appointment of DNV as validator on December 2006.</p> <p>Rapid Environmental Impact Assessment (EIA) study conducted by Care Sustainability for the project activity In January 2007.</p> <p>OK Accepted.</p> <p>CL 2 Closed.</p>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		<p>copy of the Board resolution has been provided to the DOE.</p> <ul style="list-style-type: none"> <li>- It is also to be noted that the project has been financed by Asian Development Bank, a multilateral financial institution. CDM benefits were an integral part of the project appraisal carried out by ADB for extending funding for the project. A letter from Asian Development Bank confirming that CDM was considered in the loan appraisal stage is enclosed.</li> </ul> <p>The project start date is 16 August 2006, immediately after start of the project Tata power commenced discussions for appointing Enercon as the CDM consultants for the project, the formal contract for engaging Enercon was signed in November 2006. As can be seen, the PP had immediately initiated efforts to secure the CDM status of the project; the three month time taken (from start of discussions with Enercon to signing of the contract) was on account of the several commercial and legal formalities that are required to be taken care of. The Mails/letters exchanged [from september-2006 to November-2006] on account of the several commercial and legal formalities that are required to be taken care of</p>	

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		for executing the agreement between TPC and EIL has been provided to the DoE.	
<p><b>CL3:</b> For benchmark reference why MERC order is not taken. Clarify? Financial spreadsheet needs to be provided for verification. All statutory clearances and PPA needs to be provided for verification. PLF consideration should be justified,</p>	<p>B.3.1 B.3.2 B.3.3</p>	<ul style="list-style-type: none"> <li>Benchmark return for the project activity has been determined considering the orders of the Central Electricity Regulatory Commission and various state electricity regulatory commissions including Maharashtra (refer page 11 of PDD).</li> <li>Financial spreadsheet is enclosed for DoE's perusal.</li> <li>MERC in its wind energy order dated November 24, 2003 (Page 33) has considered a PLF of 20% for wind energy projects in Maharashtra. Accordingly, the financial analysis of the project has been carried out considering normative PLF of 20%.</li> </ul>	<p>Statutory clearance from MEDA has been verified by DNV. Financial spreadsheet for the project IRR has been verified by DNV. Plant load factor for the project activity was taken from Detailed project report of April 2006 which was based on MERC tariff order for wind energy order dated November 24, 2003 (Page 33). DNV has observed the historical PLF of the project activities that are operating in the district of Ahmednagar (project activity location) &amp; it was found to be 19.07% (in year 2004-05). The project proponent has also installed 17 MW in 2001-02 in the district of Ahmednagar that have an average PLF of 19.16% for the period of year</p>



Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
			<p>2002-03 to 2004-05.</p> <p>DNV has also observed that the historically; maximum observed PLF for region of Ahmednagar is 20.76%.</p> <p>As CDM Executive Board (EB 40 Para 40) has objected the use of 16% post tax return of equity stipulated by CERC as benchmark, project proponent is requested to revise the applied benchmark for the project activity inline with EB guideline on Investment analysis (EB 41 Annexure 45).</p> <p>Project proponent is requested to justify the suitability of applied benchmark (financial hurdle rate) for the project activity.</p> <p>CL 3 Pending</p>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>CL 3 Pending</p> <p>As CDM Executive Board (EB 40 Para 40) has objected the use of 16% post tax return of equity stipulated by CERC as benchmark, project proponent is requested to revise the applied benchmark for the project activity inline with EB guideline on Investment analysis (EB 41 Annexure 45).</p> <p>Project proponent is requested to justify the suitability of applied benchmark (financial hurdle rate) for the project activity.</p>		<p>Paragraph 15, of the Guidance to Investment Analysis states that if the baseline alternative to the project activity is the supply of electricity from a grid, a benchmark approach is considered appropriate for Investment analysis. The baseline alternative for the project activity is that equivalent amount of electricity would have been supplied by the grid through existing grid connected power plants and addition of new generation sources, accordingly the Option III – Benchmark Analysis is used. The financial indicator that are identified as the post-tax equity IRR and project IRR.</p> <p>We would like to submit that, while carrying out the investment analysis, we had initially considered the 16% post tax equity return benchmark that is considered by electricity regulatory commissions for determining the tariff applicable to wind power projects. Maharashtra Electricity Regulatory Commission (MERC) in its order passed on 24th November 2003 has also considered a 16% post tax equity return for determining the applicable tariff for wind power projects in Maharashtra. Subsequently, the Executive Board in EB 40 meeting ruled that the 16% post tax return considered by regulatory</p>	<p>The indicator used initially by the project participant for benchmark analysis of this project is equity IRR used as one of the indicators by the Maharashtra Electricity Regulatory Commission (MERC) of India to determine the tariff. However as per the decision of the CDM Executive Board highlighted in EB 40 paragraph 40 that this benchmark is applicable for tariff calculation and can not be used as a benchmark for financial evaluation of project activity, hence the project participant has attempted to determine an alternate appropriate benchmark for the project activity. The investment decision for the project activity was taken based on the recommendation of Detailed Project Report of</p>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>Project proponent is requested to use inputs from the DPR for investment analysis as this is inline with EB guidelines on investment analysis ( EB 41 Annex 45- "Input values used in all investment analysis should be valid and applicable at the time of the investment decision taken by the project participant").</p>		<p>commissions is not a suitable benchmark. We would also like to submit that in addition to the regulatory commission benchmark we had considered the project IRR benchmark considered by the Indian Renewable Development Agency (IREDA) publically available benchmark for wind power projects in India and applicable at the time of investment decision.</p> <p>The other benchmark available at the time of investment decision was weighted average cost of capital (WACC) applicable to the project type i.e. electricity generation projects as the suitable benchmark. This is in accordance with the Guidance to investment analysis issued in EB 41 (paragraph 11) as per which the WACC can be considered as appropriate benchmark for Project IRR.</p> <p>The WACC has been determined using the Capital Asset Pricing Model (CAPM) considering Beta values of all listed power generating companies in India. The CAPM economic model is widely used to determine the required/expected return on equity based on potential risk of an investment. The CAPM framework is the Nobel award winning work of financial economist Dr. William Sharpe. In line with the requirements of the Guidance to Investment Analysis (paragraph 12), data and parameters used in calculation of</p>	<p>April 2006, which clearly discuss about both project and equity IRR of the project with &amp; without CDM revenues. At the time when the investment decision for the project activity was taken the other options available with the project participant were as follows:</p> <ul style="list-style-type: none"> <li>• Indian Renewable energy Development Agency (IREDA) benchmark/financial hurdle rate of 12% as per operational policy statement of IREDA, publically available benchmark for wind power projects.</li> <li>• The project proponent has calculated a project-IRR benchmark (weighted average cost of capital) for the power sector in India, which can be compared against the</li> </ul>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>Sensitivity Analysis: project proponent is requested to demonstrate at which level of deviation of the sensitivity parameters the IRR of the project will touch the benchmark and the likelihood of that being achieved.</p>		<p>cost of equity i.e. beta values of power generating companies in India, risk free rate of return, market risk premium etc. have been derived from publicly available data sources. The applicable benchmark WACC works out to 13.99%.</p> <p>Plant Load Factor is the key variable encompassing variation in wind profile, variation in off-take (including grid availability) including machine downtime. The project activity is located in the district of Ahmednagar in Maharashtra. The observed historical PLF of the project activities that are operating in the district of Ahmednagar is 19.07% in 2004-05.</p> <p>Tata have installed 17 MW in 2001-02 in the district of Ahmednagar that have an average PLF of 19.16% for the period of year 2002-03 to 2004-05.</p> <p>Maharashtra State Electricity Commission has set the 20% PLF for the state of Maharashtra. Historically, maximum observed PLF for region of Ahmednagar is 20.76%. Sensitivity analysis of the Project IRR is therefore carried out considering maximum of the highest observed PLF in the district of Ahmednagar and 10% increase over the PLF given by MERC in tariff order dated 23-Nov-2003 [Max(19.62%, 22%)].</p>	<p>project IRR.</p> <p>Since the Benchmark for calculated as per option two (WACC) is higher than the benchmark/financial hurdle rate of 12% proposed by IREDA, DNV has accepted use of IREDA benchmark as benchmark for the proposed project activity.</p> <p>Project proponent has conducted a sensitivity analysis considering a <math>\pm 10\%</math> variation in electricity generation. However DNV has analyzed all parameters contributing to more than 20% to revenues or costs to check the robustness of the financial analysis. Reasonable variations of the project cost, annual operation &amp; maintenance costs, annual output and on-grid tariff were checked by calculating the variation necessary to reach the benchmark and then discussing the likelihood for</p>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		<p>The return that the project is expected to generate at PLF of 22% is 11.42%, this is less than the benchmark.</p> <p>The sensitivity analysis clearly shows that the project is not able to generate sufficient returns. It can therefore be concluded that the project is financially not viable without CDM benefits.</p>	<p>that to happen.</p> <p>None of the parameters in the sensitivity analysis are considered to have any significant positive correlation.</p> <p>OK Accepted.</p> <p>CL 3 Closed.</p>
<p><b>CL4:</b></p> <p>It is stated that the energy generation by wind power plants in 2004-05 was 495.36 GWh as against the total generation of 82075.33 GWh. Source needs to be provided for the information and other information used for arguments.</p>	<p>B.3.1</p> <p>B.3.2</p> <p>B.3.3</p>	<ul style="list-style-type: none"> <li>• Source of data is the General Review of Electricity sector (2006) published by the Central Electricity Authority of India.</li> <li>• References to the data sources have been provided in the footnote of the PDD.</li> </ul> <p>The investment decision for the project was taken in May 2006 and was commissioned in 2007-08. At the time of investment decision the total installed wind power capacity in Maharashtra was 1,001 MW and at the time of commissioning the installed capacity in Maharashtra was 1756.38 MW. We want to submit that even at the time of commissioning our project was not part of the common practice.</p> <p>Paragraph 4(a) of the additionality tool version</p>	<p>Project proponent is requested to revise the common practice analysis as comparison of annual electricity generation (thermal dominated grid) with wind based electricity contribution (renewable energy contribution) will not reflect the appropriate scenario for Common Practice Analysis.</p> <p>CL 4 Pending</p> <p>Since generation of wind energy depends on local or</p>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p><b>CL 4 Pending:</b></p> <p>Project proponent is requested to revise the common practice analysis as comparison of annual electricity generation (thermal dominated grid) with wind based electricity contribution (renewable energy contribution) will not reflect the appropriate scenario for Common Practice Analysis.</p> <p>PP is requested to clarify why wind power project installed before tariff order of 24-November-2003 can not be compared with wind power project installed after tariff order of 24-November-2003. Reference for the same need to be incorporated in revised PDD.</p> <p>Evidence for the same need to be submitted for verification.</p>		<p>5.2 states that projects are considered similar they take place in a comparable environment. Till the year 2002-03, wind power developers in Maharashtra enjoyed sales tax benefits of Rs. 10 million per MW per year for a period of 5 years from the date of commissioning (Source: Maharashtra wind power policy 1998, MERC order dated 24 November 2003; page-5 (2.3.1)), making investment in wind attractive on a stand alone basis. The sales tax benefits were withdrawn in March-2003. Therefore wind capacity additions before March 2003 have not been considered.</p> <p>Paragraph 4(a) also states that projects can be considered similar if they rely on a broadly similar technology and are of a similar scale. Our project is of 50.4 MW capacity i.e. large scale CDM project activity (&gt;15 MW). Therefore in accordance with Paragraph 4(a), we have analysed wind projects of more than 15 MW capacities. During the period 2002-2008 a total of 476 MW was added from wind projects with more than 15 MW size. We would like to submit that the entire 476 MW is under CDM. We have provided the spreadsheet with CDM links of all these projects to the DoE.</p>	<p>region specific wind patterns installation of WEGs, Maharashtra has been considered for assessing the common practice. At the time of investment decision the total installed wind power capacity in Maharashtra was 1,001 MW and at the time of commissioning the installed capacity in Maharashtra was 1756.38 MW. As table provided in PDD for common practice analysis till the year 2002-03, the installation of wind based power projects were at peak due to sales tax benefit of Rs. 10 million per MW per year for a period of 5 years from the date of commissioning under Maharashtra wind power policy 1998, whereas in order to make investment in wind attractive on a stand alone basis MERC had withdrawn the sales tax benefits from wind power projects in March-</p>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
			<p>2002. Hence wind power projects installed prior to March 2003 can not be considered for common practice analysis. Period 2002-2008 a total of only 476 MW was added from wind projects with more than 15 MW size and this entire 476 MW capacity is under CDM pipeline and same can be verified from projects available on UNFCCC website. A detailed spreadsheet with CDM links of all these projects has been verified by DNV.</p> <p>A detailed analysis has been provided in revised PDD version 06.</p> <p>Revised PDD version 06 has been reviewed by DNV.</p> <p>OK Accepted.</p> <p>CL 4 Closed.</p>
<p><b>CL5:</b> Proof of start date of the project activity needs</p>	<p>B.3.4 C.1.1</p>	<p>The purchase order has been submitted to DOE as a proof for the start date of the project activity.</p>	<p>Purchase order placed dated 16 August 2006 has been verified by DNV.</p>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
to be provided for verification.			Purchase order date has been accepted by DNV as project start date as it is the earliest date for the project's implementation & has been verified by DNV from the purchase order placed for the project activity. OK Accepted. CL 5 Closed.
<b>CL 6</b> How stake holders were invited for comments? Provide proof of advertisement. The project proponent is requested to provide a summary of the comments received in the PDD.		<ul style="list-style-type: none"> <li>• The proof of the public notice published in the local newspaper (Sarvmat) dated 29 October 2006 has been provided to the DOE.</li> <li>• The copy minutes of minutes of meeting has been provided to the DOE for verification.</li> </ul>	Details regarding stakeholder consultation have now been included in the revised PDD version 06. Copy of local Newspapers has been verified by DNV. Minutes of meeting of stakeholder consultation has been verified by DNV. OK Accepted CL 6 Closed.



## **APPENDIX B**

---

### **CERTIFICATES OF COMPETENCE**



# CERTIFICATE OF COMPETENCE

***Murali Govindarajulu***

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-8-1-CDMJ1-i1)

<b>GHG Auditor:</b>	Yes				
<b>Technical Area</b>	<b>CDM Validator</b>	<b>CDM Verifier</b>	<b>Sector Expert</b>	<b>Methodology Expert</b>	<b>Technical Reviewer</b>
Landfill gas					
Hydro power	Aug 2009	Aug 2009			
Renewables Wind power	Jan 2009	Jan 2009			
Other renewable		Sept 2009			
Biomass					
Grid connection of isolated system		Sept 2009			
Cement					
Waste-heat / waste-gas recovery					
Efficiency of thermal power plants					
Coal mine methane					
Fuel switch					
Manure management					
Waste / wastewater treatment					
Energy efficiency	Jan 2009	Sept 2009			
N <sub>2</sub> O					
HFCs					
Flare reduction					
PFCs					
Charcoal					
CO <sub>2</sub> recovery					
Transport					
Non-renewable biomass					
Biofuel					
Pipeline leakage reduction					
SF <sub>6</sub>					

Høvik, 8 September 2009

*Michael Lehmann*

Michael Lehmann

Technical Director, Climate Change Services



## CERTIFICATE OF COMPETENCE

### *Raman Venkata Kakaraparthi*

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-8-1-CDMJ1-i1)

<b>GHG Auditor:</b>	Yes				
<b>Technical Area</b>	<b>CDM Validator</b>	<b>CDM Verifier</b>	<b>Sector Expert</b>	<b>Methodology Expert</b>	<b>Technical Reviewer</b>
Landfill gas	Jan 2009				
Hydro power	Jan 2009	Sept 2009			
Renewables	Jan 2009	Jan 2009		Jan 2009	Jan 2009
Other renewable		Sept 2009			
Biomass	Jan 2009				Aug 2009
Grid connection of isolated system		Sept 2009			
Cement					Aug 2009
Waste-heat / waste-gas recovery	Jan 2009	Jan 2009	Jan 2009		
Efficiency of thermal power plants		Sept 2009	Jan 2009		Aug 2009
Coal mine methane					
Fuel switch		Sept 2009	Jan 2009		Aug 2009
Manure management					
Waste / wastewater treatment	Jan 2009				
Energy efficiency	Jan 2009	Jan 2009	Jan 2009		Aug 2009
N <sub>2</sub> O		Sept 2009			
HFCs	Jan 2009	Jan 2009			Aug 2009
Flare reduction					
PFCs					
Charcoal					
CO <sub>2</sub> recovery		Sept 2009	Jan 2009		Aug 2009
Transport					
Non-renewable biomass					
Biofuel					
Pipeline leakage reduction					
SF <sub>6</sub>					

Høvik, 1 September 2009

*Michael Lehmann*

Michael Lehmann

Technical Director, Climate Change Services



## CERTIFICATE OF COMPETENCE

***Gaurav Srivastava***

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-8-1-CDMJ1-i1)

<b><i>GHG Auditor:</i></b>	Yes				
<b><i>Technical Area</i></b>	<b><i>CDM Validator</i></b>	<b><i>CDM Verifier</i></b>	<b><i>Sector Expert</i></b>	<b><i>Methodology Expert</i></b>	<b><i>Technical Reviewer</i></b>
<i>Landfill gas</i>					
<i>Renewables</i>					
<i>Hydro power</i>					
<i>Wind power</i>					
<i>Other renewable</i>					
<i>Biomass</i>					
<i>Grid connection of isolated system</i>					
<i>Cement</i>					
<i>Waste-heat / waste-gas recovery</i>					
<i>Efficiency of thermal power plants</i>					
<i>Coal mine methane</i>					
<i>Fuel switch</i>					
<i>Manure management</i>					
<i>Waste / wastewater treatment</i>					
<i>Energy efficiency</i>					
<i>N<sub>2</sub>O</i>					
<i>HFCs</i>					
<i>Flare reduction</i>					
<i>PFCs</i>					
<i>Charcoal</i>					
<i>CO<sub>2</sub> recovery</i>					
<i>Transport</i>					
<i>Non-renewable biomass</i>					
<i>Biofuel</i>					
<i>Pipeline leakage reduction</i>					
<i>SF<sub>6</sub></i>					

Høvik, 5 November 2009

*Michael Lehmann*

Michael Lehmann

Technical Director, Climate Change Services



---

## CERTIFICATE OF COMPETENCE

---

### ***Ma Paa Puratchikkanal***

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-  
CDMJi-i1

<b>GHG Auditor:</b>	Yes		
<b>CDM Validator:</b>	--	<b>JI Validator:</b>	--
<b>CDM Verifier:</b>	--	<b>JI Verifier:</b>	--
<b>Industry Sector Expert for Sectoral Scope(s):</b>	--		

Høvik, 5 February 2007

Einar Telnes  
Director, International Climate Change Services

Michael Lehmann  
Technical Director