



VALIDATION REPORT

“Roaring 40’s Wind Farms (Khandke) Private Limited” in India

REPORT No. 2007-1077

REVISION No.: 03

DET NORSKE VERITAS



VALIDATION REPORT

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Approved by: Michael Lehmann	Organisational unit: Climate Change Services
Client: Roaring 40s Wind Farms (Khandake) Private Limited	Client ref.: Mr. Mahesh Makhija

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CERTIFICATION AS

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Project Name: Roaring 40's Wind Farms (Khandke) Private Limited

Country: India

Methodology: ACM0002

Version: 09

GHG reducing Measure/Technology: Grid-connected electricity generation from renewable energy sources (wind energy)

ER estimate: 29 154 tCO₂e/annum

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 "Roaring 40's Wind Farms (Khandke) Private Limited" project in India, as described in the PDD of 24 September 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 "Roaring 40's Wind Farms (Khandke) Private Limited" project in India as a CDM project activity.

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Abbreviations

BM	Build margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Clarification request
CM	Combined margin
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNA	Designated National Authority
DNV	Det Norske Veritas
EIL	Enercon India Limited
GHG	Greenhouse gas(es)
HSBC	Hongkong and Shanghai Banking Corporation Limited
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal rate of return
LoA	Letter of Approval
MERC	Maharashtra Electricity Regulatory Commission
MNES	Ministry of Non-conventional Energy Sources
MoEF	Ministry of Environment and Forests
MP	Monitoring Plan
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OM	Operating margin
PDD	Project Design Document
PLF	Plant load factor
PPA	Power purchase agreement
UNFCCC	United Nations Framework Convention on Climate Change
WEG	Wind Energy Generator
WREG	Western Regional Electricity Grid



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1 EXECUTIVE SUMMARY – VALIDATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a validation of the “Roaring 40’s Wind Farms (Khandke) Private Limited” 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 project participant is Roaring 40s Wind Farms (Khandke) Private Limited of India. The host Party India meets all participation requirements and the DNA of India has approved the project on 28 May 2008 and authorized the project participant. The DNA of India also confirmed vide the letter of approval that the project assists in achieving sustainable development /2/.

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

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

By generating electricity from renewable energy sources and exporting to the western regional grid, the project activity displaces an equivalent amount of grid power, which is predominantly fossil fuel based. Hence, the project results in reductions of CO₂ emissions that are real, measurable and give 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 29 154 t CO₂e 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 monitoring plan has been generally identified. The procedures for monitoring, operating and maintenance have been elaborated. Adequate training and monitoring procedures have been implemented.

In summary, it is DNV’s opinion that the “Roaring 40’s Wind Farms (Khandke) Private Limited” project in India, as described in the PDD of version 06 dated 24 September 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 /3/. DNV thus requests the registration of the “Roaring 40’s Wind Farms (Khandke) Private Limited” project in India as a CDM project activity.



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2 INTRODUCTION

Roaring 40s Wind Farms (Khandke) Private Limited has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the “Roaring 40’s Wind Farms (Khandke) Private Limited” project in India. 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. The validation report version has been revised pursuant to the Corrections request issued by the Executive board of the UNFCCC after the request for Review.

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 /4/.

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



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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 outlines the documentation reviewed during the validation:

- /1/ Roaring 40s: CDM-PDD initial version 01 dated 22 May 2007, re-webhosted PDD version 04 dated 15 August 2008, version 05 dated 05 September 2009 and final version 06 dated 24 September 2010.
- /2/ Letter of Approval from DNA of India dated 28 May 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/ Confirmation Letter from HSBC bank that project activity was evaluated against the interest rate of 12.5% & CDM revenues was considered as a part of cash flow while evaluating the project activity dated 26 May 2009.
- /7/ Purchase Order placed for Wind Energy Generators on Enercon India Limited, dated 19 April 2007.
- /8/ CEA: CO2 Baseline Database for the Indian Power Sector version 1.1 dated 21 December 2006.
www.cea.nic.in
- /9/ Detailed Project Report prepared by Roaring 40s Wind Farms (Khandke) Private Limited dated 02 March 2007.
- /10/ Minutes of meeting of board of director’s held on 19 March 2007.
- /11/ Rapid Environmental Impact Assessment carried out by Care Sustainability January 2007.
- /12/ Roaring 40s generation estimate from Enercon India limited dated 14 February 2007.
- /13/ Final budgetary offers received from the Enercon India Limited dated 28 December 2006.
- /14/ Commissioning certificates of Wind Energy Generators dated 27 June 2007, 30 June 2007, 22 August 2007, 27 September 2007, 01 October 2007, 12 October 2007 & 19 December 2007.
- /15/ CDM Executive Board: Guidance on Investment Analysis EB 41 Annexure-45.
- /16/ Maharashtra Electricity Regulatory Commission tariff order dated 24 Nov 2003.
- /17/ Financial analysis spreadsheet for roaring 40s phase I: [Project IRR Phase-I_29-June-](#)



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[2009.xls](#)

- /18/ MEDA electricity generation data of Ahmednagar for year 2004-05.
- /19/ Electricity generation data of Tata 17 MW wind power project for year 2002-03 & 2004-05 available with project proponent.
- /20/ <http://www.windpowerindia.com/statyear.html> to demonstrate wind capacity in state of Maharashtra at the time of start date of project activity (19 April 2007) & project commissioning.
- /21/ 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>
- /22/ Detailed spreadsheet with CDM links of all CDM projects or projects under CDM pipeline to demonstrate common practice analysis.
- /23/ A notice published in the local newspaper, Sarvmat on 29 October 2006 inviting stakeholders to comment on the project.
- /24/ Minutes of meeting of local stakeholder meeting conducted on 15 November 2006.
- /25/ HSBC Hedging Agreement with project proponent dated 05 July 2007.
- /26/ Loan Payment sheet dated 28 March 2009.
- /27/ MEDA Clearance for the project activity dated 04 June 2007, 11 June 2007 & 14 June 2007.
- /28/ Declaration letter from Enercon India Limited for Stakeholder consultation for the project activity dated 08 October 2009.
- /29/ MEDA Infrastructure refund document for refund of revenue spent in building power evacuation facility.
- /30/ CDM consulting agreement signed between project proponent & Enercon India Limited dated 23 February 2007.
- /31/ MSEDCL; Sales invoices raised by project proponent to MSEDCL for the period from 08 May 2008 to 02 February 2010.
- /32/ M/s Roaring 40s wind farms (Khandke) private limited: power purchase agreement signed between project proponent and MSEDCL dated 24 September 2007, 10 October 2007, 31 December 2007 and 06 March 2008.
- /33/ Enercon India Limited (O & M Contractor): Electricity apportioning procedure certificate issued by Enercon India Limited (O & M Contractor) for the project activity.

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

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



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3.2 Follow-up Interviews with Project Stakeholders

From 04-06 July 2007 DNV's 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, Roaring 40s Wind Farms (Khandke) Private Limited & Enercon India Limited (responsible for operation & maintenance) were interviewed. The main topics of the interviews are summarized in Table 1:

Table 1 Interview topics

Date	Name	Organization	Topic
04-07 July 2007	Mr. Brij Mohan	Enercon India Limited (EIL)	➤ Financials of the project activity
	Mr. Himanshu Bhatnagar		➤ Environmental compliance
04-07 July 2007	Mr. Sanjay Powar	Roaring 40s Wind Farms (Khandke) Private Limited	➤ 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 is customised for the project. The protocol shows in transparent manner criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- 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 "Roaring 40's Wind Farms (Khandke) Private Limited" project 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:



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- 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. In line with the EB guidance vide EB 56, point 66 (l), the PDD and the validation report have been updated to:

- a) Demonstrate the electricity tariff considered for investment analysis is still valid and is applicable for the project activity.
- b) Validation of monitoring of each of the wind farms located in the four villages, in line with VVM ver1, paragraph 121.



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Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities				
Requirement	Reference	Conclusion		
<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 either acceptable based on evidence provided (OK), a Corrective Action Request (CAR) of risk or non-compliance with stated requirements or a request for Clarification (CL) where further clarifications are needed.</i>		

Validation Protocol Table 2: Requirement checklist				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
<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 corrective action request (CAR) 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>

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Validation conclusion
<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 final validation report underwent a technical review before requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.



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3.5 Validation Team

The validation team consisted of the following personnel:

<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	Ramachandran	Ramesh	India					√	

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



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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 validation findings relate to the project design as documented and described in the final project design documentation dated 24 September 2010 /1/.

4.1 Participation Requirements

The project participant is Roaring 40's Wind Farms (Khandke) Private Limited of India. The project is proposed as a unilateral project and no project proponent from any Annex-I Party has yet been identified. The host Party India meets all the requirements for participating in a CDM project. It has been validated from the CDM India website (<http://cdmindia.nic.in/cdmindia/projectList.jsp?search=search>) that the project has been approved by the DNA of India. The Ministry of Environment and Forests, the DNA of India has approved the project with a letter of approval dated 28 May 2008, which also confirms that the project assists in achieving sustainable development in India /2/.

No public funding from an Annex I Party is involved in the project and the validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards India.

4.2 Project Design

The project activity, the "Roaring 40s Wind Farms (Khandke) Private Limited" project, is designed to construct a 50.4 MW wind farm in the state of Maharashtra, India. The proposed wind farm will be developed in three phases. The phase-I of the project consisting of 21 machines of 800kW each aggregating to 16.8 MW has been commissioned. The wind farms in phase-II and Phase-III having capacity of 19.2 MW and 14.4 MW is proposed to be commissioned subsequently.

Initially the project proponent intended to develop the total capacity 50.4 MW as a single CDM project activity. Hence, the initial PDD for the project was webhosted for 50.4 MW capacity on UNFCCC website¹. The DNA of India approval is conditional upon the submission of clearances from MEDA (nodal agency for development of renewable energy in the state of Maharashtra), which can only be achieved once the land acquisition for all phases will be completed. Project proponent thus decided to develop all three phases as separate CDM project so that the DNA approval can be secured in the phases and CDM registration of project activities can be achieved timely.

The project activity (phase I) consists 21 nos of wind energy generators (WEGs) each of 800 kW rating, in the Ranjani, Ratadgaon, Agadgaon and Bardari villages in Khandke Taluk, Ahmednagar District of Maharashtra, thereby aggregating to 16.8 MW. All the WEG's in the project activity 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 to the western regional grid of India via the Maharashtra state electricity grid. By the implementation of the project activity, energy generated using renewable energy will displace equivalent energy generation from the fossil fuel dominated western regional grid. The

¹ http://www.dnv.com/focus/climate_change/projects/projectdetails.asp?ProjectId=1242



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project is expected to generate 31.008 GWh of energy per annum at a plant load factor of 21.07% which has been verified from the generation data provided by Enercon India Limited (technology supplier) for the project activity /12/.

The start date of the project activity has been identified as 19 April 2007, which is the date of the purchase order placed for the wind turbines of the project activity, and was evidenced from the purchase order document /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 31 January 2010 (or on the date of registration of the CDM project activity, whichever is later). The project is expected to result in 29 154 tCO₂e emission reductions per annum over the fixed crediting period.

The project description is to the consideration of DNV is complete and accurate.

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 project is a new installation of wind electricity generators which harnesses the wind potential available in the region and it displaces fossil fuel based electricity from the western regional grid of India.
- The project activity is connected to a 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 incase 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 electricity grid, the baseline for this project activity is a function of the generation mix of the western region grid. The selection of the western region grid 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 methodology, the weights for OM and BM have been taken as 75:25. The combined margin emission



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coefficient for the western grid of India has been calculated at 0.940 22 CO₂e/MWh and is fixed ex ante for the entire fixed crediting period. The CM 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 for the power sector in India based on detailed authenticated information obtained from all operating power stations in the country /8/. This CO₂ baseline database provides information about the OM and BM factors of all the regional electricity grids in India. DNV confirms that the database 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 tCO₂e/MWh and the build margin to be 0.7772 tCO₂e/MWh /8/. The selected sources and gases are justified for the project activity.

	GHGs involved	Description
Baseline emissions	CO ₂	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 a financial analysis.

4.4.1 CDM consideration and continued action to secure CDM status

The start date of the project activity has been identified as 19 April 2007, which is the date of purchase order placed for the wind turbines of the project activity, and was evidenced from the purchase order document /7/. The project activity was commissioned in phases starting from 27 June 2007 and ending on 19 December 2007 /14/.

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

- On 23 February 2007 project proponent signed CDM agreement with Enercon India Limited /30/.
- The Board of Directors of Roaring 40s Wind Farms (khandke) Private Limited approved the project activity during the meeting dated 19 March 2007 /10/. The decision has been taken based on the DPR which indicates that the project activity is



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financially attractive with CDM revenue. The detailed project report for the project activity dated 02 March 2007 /9/ has been verified. The relevance of the input parameters used in the financial analysis of the DPR is found to be appropriate since the DPR has been prepared based on the final budgetary offer received from the WTG Supplier /13/ dated 28 December 2006.

- CDM consideration for the project was also verified from the confirmation letter from HSBC bank (lender for the project activity) dated 26 May 2009 which states that Bank had considered the CDM revenue as a part of project cash flows /6/.

Continued action to secure CDM status:

- The PDD was webhosted for global stakeholder consultation process² on 07 June 2007, within a period of less than 2 months from the starting date of the project activity, 19 April 2007.
- Project proponent approached DNA of India for host country approval on 04 January 2008 /2/.
- The project proponent was invited by the DNA of India to give a presentation on project activity on 13 February 2008 /2/.
- On 28 May 2008 project proponent received the Letter of approval from DNA of India /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.

4.4.3 Investment analysis: Choice of approach

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 the selected 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 /16/& has been verified by DNV from the detailed project report for the project activity /9/. 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 revised the benchmark for the project activity. The lending rate of 12.5% applicable for the project activity has been selected as the benchmark. This applicable lending rate has been checked from the

² http://www.dnv.com/focus/climate_change/projects/projectdetails.asp?ProjectId=1242



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commercial lending rate of 12.5% quoted by HSBC (lender for the project activity) & has been further verified by DNV from HSBC hedging agreement & actual loan payment sheet /25/ /26/. Also, the investment decision for the project activity was taken based on the DPR of 02 March 2007 /9/ which clearly discusses that the loan for the project activity will be provided by HSBC bank. It has been verified by DNV from the confirmation letter provided by HSBC bank dated 26 May 2009 /6/ that the project activity was evaluated against the applied benchmark of 12.5%. DNV confirms that this benchmark is inline with the EB guidance on Investment analysis (Para 11 which states that local commercial lending rates are appropriate benchmark for project IRR) /15/.

4.4.5 Investment analysis: Input parameters

The input parameters except electricity tariff used in the financial analysis of the project activity has been sourced from the DPR developed by Roaring 40s Wind Farms (Khandake) Private Limited of 02 March 2007 /9/ and the Tariff has been sourced from the MERC tariff order of 24 November 2003 /16/. Prior to investment decision for the project activity, project proponent has invited the quotation from different wind turbine manufacturers & based on the final budgetary offer (final bid) from Enercon India limited dated 28 December 2006 /13/, project proponent has prepared a DPR on 02 March 2007 /9/. Given this short period of time between the preparation of DPR and the decision to proceed with the project activity, it is thus reasonable to assume that the DPR 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, the electricity tariff and the load factor considered in DPR against the final bid received from Enercon India Limited /6/ & values proposed by MERC in its tariff order dated 24 November 2003 /16/, and the input values were found to be consistent.

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 and income tax benefits due to accelerated depreciation has been considered in the financial analysis. The following documents have been verified for confirming the figures used in the financial calculations.

- Final budgetary offer received from the Enercon India Limited (WTG Supplier) dated 28 December 2006 /13/ for investment cost.
- Detailed Letter of Intent (purchase order) placed on Enercon India Limited for investment cost, O & M costs /7/
- DNV has cross checked that the Maharashtra Electricity Regulation commission tariff order dated 24 November 2003 /16/, considered for electricity tariff in the investment analysis for the project activity, is still valid and is applicable for all wind power projects in Maharashtra that have been initiated after November 2003. DNV has cross checked the electricity tariff applicable for the project activity as INR 3.50/kWh with annual escalation of INR 0.15/kWh till 13th year of operation (VAT is not applicable for sale of electricity as can be verified from recent sales invoice raised to Maharashtra state electricity distribution company limited that no tax has been included in the invoice /31/). The same has been considered in the investment analysis sheet submitted for registration stage. This has been further crosschecked by DNV against the actual power purchase agreement signed for the project activity /32/ and recent sales invoices raised to Maharashtra state electricity distribution company limited



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(MSEDCL, a distribution wing of Maharashtra State Electricity Board) /31/. Inline with para 109 of VVM manual version 01, DNV confirms that the actual electricity tariff matches with the values provided in Maharashtra Electricity Regulation commission tariff order dated 24 November 2003 and energy purchase agreement /32/.

- MEDA Infrastructure refund, 50% of the revenue spent in building infrastructure for power evacuation will be refunded by MEDA over a period of five year.
- Generation data provided by Enercon India Limited dated 14 February 2007 /12/ & is compared against average PLF considered by Maharashtra Electricity Regulatory Commission (MERC) in its tariff order dated 24 November 2003 for group three projects (project commissioned after 2003) for the purposes of tariff working.

4.4.6 Investment analysis: Calculation and conclusion

The IRR calculations & assumptions provided in a spreadsheet are consistent with the DPR of 02 March 2007 /9/. The calculations were verified and found to in line with EB's guidance on investment analysis /15/. The assumptions used in the calculations are appropriate & have been verified by DNV. The project-IRR of the project over 20 years is 8.87% without the income from CERs /17/, and the project is therefore financially less attractive compared to the benchmark of 12.5% in the absence of CDM benefits. With CDM revenues, the project IRR improves to 12.68%, which is above the benchmark and thus makes the project feasible.

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 25.55% (to 26.45% PLF) the project IRR touches the benchmark of 12.5% adopted by the project participant. The PLF of 21.07% considered in the financial analysis is based on the generation data provided by Enercon India Limited /12/. Moreover, the average PLF considered by Maharashtra Electricity Regulatory Commission (MERC) in its tariff order dated 24 November 2003 from group three projects (project commissioned after 2003) for the purposes of tariff working is only 20% /16/. The project activity is located in the district of Ahmednagar in Maharashtra where the observed historical PLF is 19.07% (in year 2004-05) /18/. However, historically maximum observed PLF for region of Ahmednagar is 19.62% /19/. Hence an increase of 25.55% in electricity generation to achieve a PLF of 26.45% is highly unlikely. Hence the validation team accepted the PLF of 21.07% considered by the project participant for the IRR calculations.

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 Maharashtra Electricity Regulation commission tariff order dated 24 November 2003 /16/. This has been further crosschecked by DNV against the actual power purchase agreement signed for the project activity /32/ and recent sales invoices raised to Maharashtra state



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electricity distribution company limited (MSEDCL, a distribution wing of Maharashtra State Electricity Board) /31/. 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 14th year onwards is uncertain today.

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. There has been *no change* in the assumptions made for the IRR calculations except the tariff. The PPA is only for 13 years and hence the tariff of Rs.2.34/kWh after 13th year has been used.

Electricity tariff after 13 year is 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 in determining tariff and is justified 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"*³.

*"The rate payable gets reduced after 10 years (i.e. after repayment of loan) so that the net average cost of energy gets reduced"*⁴.

*"To ensure that developer does not 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"*⁵.

The above extracts indicate that the tariff will reduce after 13th year and even after considering base year tariff of Rs.3.50/kWh without any annual escalation till 20 year the project IRR becomes 9.61% and is still well below the applied benchmark of 12.5% for the project activity. There has been no change in any of the assumptions while making the projections for 20 years except the tariff, the 'cost plus approach' adopted for determining the tariff from 14th year onwards is found acceptable. There has been no deviation from the accepted principles in making projections or computing IRR, and there are no arithmetical inaccuracies in the calculation the Project IRR computed.

Decrease in Investment cost: With a decrease in investment cost by 20% the project IRR becomes 12.58% and thus exceeds the benchmark adopted by the project participant. However, in DNV's opinion a decrease of 20% 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 Roaring 40s Wind Farms (Khandke) Private Limited and the actual project cost has been verified by DNV from reviewing the

³ http://mercindia.org.in/pdf/Detail_Wind_Energy_Order.pdf Refer Page No: 14 Paragraph 2 of the document.

⁴ <http://mercindia.org.in/pdf/Annexures.pdf> Refer Page No: 135 Paragraph 2 of the document.

⁵ <http://mercindia.org.in/pdf/Annexures.pdf> Refer Page No: 141 Point No. 15 of the document.



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purchase order /7/. In DNV's opinion, 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.

The above discussion establishes that the project activity is financially not viable without the benefits from CDM.

4.4.8 Common Practice:

The state of Maharashtra has been considered for assessing the common practice. Since the policies and tariff regime is consistent through the state of Maharashtra, DNV considers the selection of the region is appropriate. Wind project capacity addition after March 2003 has been considered for the common practice analysis. As also provided in table 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 benefits of Rs. 10 million per MW per year for a period of 5 years from the date of commissioning as per Maharashtra wind power policy 1998 /21/, 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 /21/. Hence, it is deemed acceptable that wind power projects installed prior to March 2003 are not considered for common practice analysis.

At the time of investment decision the total installed wind power capacity in Maharashtra was verified to be 1 001 MW /20/ and at the time of commissioning the installed capacity in Maharashtra was verified at 1 756.38 MW /20/. In the period 2003-2008 a total capacity of 1359.875 MW was added out of which 476 MW capacity 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/22/.

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.

4.5 Monitoring

DNV confirms that the current metering arrangement for the project activity meets the requirement of the applied methodology (ACM0002 version 09) which requires electricity supplied to the grid by the project activity need to be monitored (difference of electricity exported and imported to/from grid, both measured). In case of the project activity, the total electricity exported and imported to/from grid (from the WEGs connected to feeder-2 and 3) are measured through Main Meter (04880814-feeder 2 and 04880816- feeder 3) and check meter (04880815- feeder 2 and 04880817- feeder 3). Joint meter readings of these meters (main meter 04880814 and check meter 04880815 for feeder 2 and main meter 04880816 and check meter 04880817 for feeder 3) are conducted every month by MSEDCL (distribution wing of Maharashtra state electricity board) in the presence of Enercon India Limited (O&M contractor for wind farm). The electricity export and import from the WEGs connected to the feeder 2 and feeder 3 is apportioned based on the on LCS meter readings available from the individual WEGs (provided by Enercon the O&M contractor). The apportioning procedure to be followed incase of the project activity is included in Appendix 3 of the PDD. The electricity imported to/from grid from the WEGs connected (15 machines of feeder 2 and 6



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machines of feeder 3) to the project activity is taken from the energy breakup report certified by MSEDCL, against which the project proponent raises invoice to MSEDCL. The invoices can be used for the double checking purposes as per the requirement of the methodology.

The main (04880814 - feeder 2 and 04880816 - feeder 3) and the check meter (04880815 - feeder 2 and 04880817 - feeder 3), installed at substation are of 0.2 accuracy class and will be calibrated by MSEDCL on annual basis. The QA/QC procedures for apportioning (based on individual WTGs connected to feeder 2 and 3) will be the responsibility of Enercon India Limited, the O&M contractor for the wind Farm. A detailed description of QA/QC procedures to be followed for apportioning has described and included in Appendix 3 of the PDD.

DNV confirms that the current monitoring arrangement as discussed in above is feasible within the project design and data management, quality assurance and quality control procedures described in Appendix 3 of the PDD are sufficient to ensure that the emission reductions achieved by/resulting from the proposed CDM project activity can be reported ex post and can be verified.

The monitoring plan will give opportunity for real measurements of achieved emission reductions. Since the project is a wind energy generation activity, no indicators have been defined regarding project emissions. Leakage accounting has not been considered for the project since the renewable energy technology equipment is new equipment and not transferred from another activity.

Monitoring of sustainable development indicators is not required by the Indian DNA. There are no environmental impacts due to the project activity.

4.5.1 Parameters determined ex-ante

The combined margin emission coefficient for the western grid of India has been calculated at 0.940.22 tCO₂e/MWh and is fixed ex ante for the entire crediting period. The CM 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 for the power sector in India based on detailed authenticated information obtained from all operating power stations in the country /8/. This CO₂ baseline database provides information about the OM and BM factors of all the regional electricity grids in India. DNV confirms that the database is an official publication of the Government of India for the purpose of CDM baselines and 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 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 0.9945 t CO₂e/MWh and the build margin to be 0.7772 t CO₂e/MWh /8/.

4.5.2 Parameters monitored ex-post

- EG_{f2}, JMR, _{export}: Electricity exported by all the Turbines (turbines included in the project activity and turbines that are not part of the project activity) connected to feeder 2 at main (04880814) and the check meter (04880815) at 33 kV. The electricity exported to feeder 2 will be monitored continuously and recorded on monthly basis jointly by the officials of MSEDCL (a distribution wing of MSEB also responsible for metering & calibration) and representative of project proponent in the joint meter reading records.



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- $EG_{f3, JMR, export}$: electricity exported by all the Turbines (turbines included in the project activity and turbines that are not part of the project activity) connected to feeder 3 at main (04880816) and the check meter (04880817) at 33 kV. The electricity exported to feeder 3 will be monitored continuously and recorded on monthly basis jointly by the officials of MSEDCL (a distribution wing of MSEB also responsible for metering & calibration) and representative of project proponent in the joint meter reading records.
- $EG_{f2, JMR, Import}$: electricity imported by all the Turbines (turbines included in the project activity and turbines that are not part of the project activity) connected to feeder 2 at main (04880814) and the check meter (04880815) at 33 kV. The electricity imported to feeder 2 will be monitored continuously and recorded on monthly basis jointly by the officials of MSEDCL (a distribution wing of MSEB also responsible for metering & calibration) and representative of project proponent in the joint meter reading records.
- $EG_{f3, JMR, Import}$: electricity imported by all the Turbines (turbines included in the project activity and turbines that are not part of the project activity) connected to feeder 3 at main (04880816) and the check meter (04880817) at 33 kV. The electricity imported to feeder 3 will be monitored continuously and recorded on monthly basis jointly by the officials of MSEDCL (a distribution wing of MSEB also responsible for metering & calibration) and representative of project proponent in the joint meter reading records.
- $EG_{f2,y}$: net electricity exported to the grid by the turbines of project activity connected to feeder 2 will be calculated by following the apportioning procedure prescribed by O & M contractor for the wind farm (Enercon India limited), as described in Appendix 3 of the PDD. The apportioning will be done based on LCS meters readings of all WTGs connected to feeder 2. Since the project proponent does not have any control over the LCS meter readings of other project developers and therefore the values provided in energy break up report (prepared by Enercon India limited and certified by the MSEDCL) will be directly used for the purpose of calculating the net electricity exported to the grid by the turbines of project activity connected to feeder 2.
- $EG_{f3,y}$: the net electricity exported to the grid by the turbines of project activity connected to feeder 3 will be calculated by following the apportioning procedure prescribed by O & M contractor for the wind farm (Enercon India limited), as described in Appendix 3 of the PDD. The apportioning will be done based on LCS meters readings of all WTGs connected to feeder 3 and meter reading of import export main and check meters (main meter- 04880816 and the check meter – 04880817) connected to feeder 3. Since the project proponent does not have any control over the LCS meter readings of other project developers and therefore the values provided in energy break up report (prepared by Enercon India limited and certified by the MSEDCL) will be directly used for the purpose of calculating the net electricity exported to the grid by the turbines of project activity connected to feeder 3.
- EG_y : net electricity supplied to the grid by the project activity (via feeder 2 and 3) is summation of net electricity supplied to the grid by the turbines of the project activity connected to feeder 2 ($EG_{f2,y}$) and net electricity supplied to the grid by the turbines of the project activity connected to feeder 3 ($EG_{f3,y}$).



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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 Roaring 40s Wind Farms (Khandke) Private Limited. The project operation and maintenance is outsourced to Enercon India Limited. The meters at the uploading station are two way meters and are in custody of State Electricity Board. The readings in these meters is taken by SEB officials and used for billing purposes. These meters are periodically tested & calibrated by officials of State Electricity Board. The monthly electricity sales receipts will also be archived until 2 years after the crediting period to facilitate cross-checking during the crediting period.

4.6 Estimate of GHG Emission

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 CO₂e/MWh and is fixed *ex ante* for the entire fixed crediting period. The CM 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 for the power sector in India based on detailed authenticated information obtained from all operating power stations in the country /8/. DNV confirms that the database 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 grid based on net generation for the year 2004-05 as described in ACM0002 version 09 /3/. The project is expected to result in emission reductions of 29 154 t CO₂ 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. However Enercon India Limited, the equipment supplier and operation and maintenance contractor for the wind farm has conducted a rapid environmental impact assessment study for the wind power project in the project activity area. Enercon India Limited 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 /11/. The project is not likely to create any adverse



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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 /23/ by Enercon India Limited, the equipment supplier and operation and maintenance contractor for the project activity. The Enercon India Limited, the equipment supplier and operation and maintenance contractor has conducted a local stakeholder meeting in Ahmednagar District on 15 November-2006 /24/. The authorities of the local administration, local communities, farmers, officials of Gram Panchayat and O & M contractor were invited to comment on project activity. A detailed description of stakeholder consultation has been provided in Appendix -2 of PDD.

DNV was able to confirm the adequacy of the local stakeholder consultation process. DNV has checked all the questionnaires received. The survey shows that the proposed project receives support from the local people.

DNV considers the local stakeholder consultation carried out adequately.

4.9 Comments by Parties, Stakeholders and NGOs

The PDD of 22 May 2007 was made publicly available on DNV's climate change website⁶ (www.dnv.com/certification/climatechange) as "Roaring 40s Wind Farms Private Limited" and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 07 June 2007 to 06 July 2007. No comments were received during this period.

The PDD of 15 August 2008 was again re-webhosted⁷ due to revision of applied version of methodology on 15 October 2008 to invite comments during a 30 days period from 16 October 2008 to 14 November 2008. No comments were received during this period.

In the re-webhosted PDD of 15 August 2008, the project proponent has changed the project name to "Roaring 40's Wind Farms (khandke) Private Limited" which is in accordance to the name indicated in letter of approval by the DNA of India.

⁶ <http://cdm.unfccc.int/Projects/Validation/DB/GT5ME4TC32NKLA6A22ZBR00FYBC54N/view.html>

⁷ <http://cdm.unfccc.int/Projects/Validation/DB/KL2Y2JVWW1TCN9T1595CV1M6F1X3J7/view.html>

APPENDIX A

CDM VALIDATION PROTOCOL

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

Requirement	Reference	Conclusion
About Parties		
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	CAR-1
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
About additionality		

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	CAR-5 CAR-6 CAR-7 CL-2 CL-3 OK
About forecast emission reductions and environmental impacts		
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
About stakeholder involvement		
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	CL-5 OK
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
Other		
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.
A. General Description of Project Activity <i>The project design is assessed.</i>					
A.1. Project Boundaries <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 Parwadi, Pimpalgaon, Bardari, Ratadgaon, Devgaon, Agadgaon, Ranjani, Maghni, Balewadi, Marathawadi, Dagadwadi, and Deulgaon Ghat villages in Khandke Taluk in the district of Ahmednagar in Maharashtra. The unique identification of each turbine needs to be provided in the PDD.	CAR-2	OK
A.1.2. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/	DR/I	The 50.40 MW Wind Power Project comprises 63 numbers of Wind Energy Generators (WEG) each of 800 kW capacities. The plant is grid connected (Western grid) and houses the metering, switchgear and other protection equipment. Project proponent is requested to clarify why installed capacity of plant got reduced from 50.4 MW to 16.8 MW.	CAR-9	OK
A.2. Participation Requirements <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>					

* MoV = Means of Verification, DR= Document Review, I= Interview
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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
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 participant? Clarify No Annex-I country has been identified as yet.	CL-1	OK
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.	CAR-1	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.	CAR-1	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
A.3. Technology to be employed <i>Validation of project technology focuses on the project engineering, choice of technology and competence/</i>					

* MoV = Means of Verification, DR= Document Review, I= Interview
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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<i>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 current good practices?	/1/ /7/ /9/	DR/I	The WEGs installed under the project has 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.		OK
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
A.4. Contribution to Sustainable Development <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.	CAR-1	OK

* MoV = Means of Verification, DR= Document Review, I= Interview
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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
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 opportunities during construction and also operation phases.		OK
B. Project Baseline <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.1. Baseline Methodology <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 latest version of methodology as the project is not likely to be registered in version 06.	CAR-6	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">The project activity involves an electricity capacity addition from a renewable source (wind based) providing		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			<p>power to the western regional grid.</p> <ul style="list-style-type: none"> The geographic and system boundaries for the relevant electricity grid have been clearly identified to be the western electricity grid. <p>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.</p>		
B.2. Baseline Scenario Determination <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	CAR-6	OK

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			<p>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 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 & 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.	CAR-6	OK
B.2.4. Has the baseline scenario been determined using conservative assumptions where possible?	/1/ /3/	DR/I	Please refer to earlier comments.	CAR-6	OK

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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
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.	CAR-4	OK
B.2.7. Have the major risks to the baseline been identified?	/1/	DR/I	Please refer to earlier comments.	CAR-6	OK
B.3. Additionality Determination <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/ /3/ /4/ /5/ /6/ /7/ /9/ /10/ /12/ /13/ /14/ /15/	DR/I	<p>Yes, the project's additionality is demonstrated using "Tool for the demonstration and assessment of additionality", version 02.</p> <p>Step 0: 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.</p> <p>Step 1: 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</p>	CAR-5 CL-2 CL-3 CAR-7	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	/16/ /17/ /18/ /19/ /20/ /21/ /22/		<p>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. 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>Step 2: Investment analysis:</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 9.27% which is lower than the benchmark equity IRR of 16% for independent power producers (IPP) as per KERC order. The IRR improves to 12.79 % with CDM revenues.</p>		

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			<p>A sensitivity analysis has also been performed with $\pm 5\%$ change in PLF. And have shown that the equity IRR is less than 16%.</p> <p>The financial spread sheet calculations need to be provided for verification.</p> <p>Step 3: Not chosen.</p> <p>Step 4: 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>Step 5: 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"> • IRR and sensitivity analysis detail Justification / work sheet to be provided. 		

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			<ul style="list-style-type: none"> PLF consideration should be justified. What are the incentives offered by the Government of Maharashtra? Have these been considered in the financial analysis? PPA should be furnished. <p>All statutory clearances need to be provided for verification.</p> <p>Project proponent is requested to use latest "Tools for demonstration and assessment of additionality". Version 05.2</p>		
B.3.2. Are all assumptions stated in a transparent and conservative manner?	/1/ /4/ /6/ /7/ /9/ /13/	DR/I	Clarifications Pending from B.3.1	CL2 CL3 CAR7	OK
B.3.3. Is sufficient evidence provided to support the relevance of the arguments made?	/1/ /15/ /16/ /17/ /18/ /19/ /20/ /21/ /22/	DR/I	Clarifications Pending from B.3.1	CL2 CL3 CAR7	OK
B.3.4. If the starting date of the project activity is before the date of validation, has sufficient evidence	/1/ /7/	DR/I	The starting date of the project activity is April 19th 2007 (Date of purchase order) and	CL2	OK

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been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?	/9/ /10/ /13/		<p>it is before the start date of validation.</p> <p>Proof of start date of the project activity needs to be provided for verification.</p> <p>Since start date of the project activity is prior to the start of validation, project proponent is 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"> ○ Project Proponent was aware about CDM prior to start date of project activity. ○ CDM was a decisive factor to go ahead with the project activity. <p>Continuous serious actions were taken by project proponent in order to achieve CDM revenue.</p>	CL-4	
B.4. Calculation of GHG Emission Reductions – Project emissions <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.5. Calculation of GHG Emission Reductions – Baseline					

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emissions <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 approved methodology and in a complete and transparent manner?	/1/ /8/	DR/I	The calculation of the baseline emissions has 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 ₂ /MWh.	CAR-4	OK
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/ /9/	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.	CL-3	OK
B.6. Calculation of GHG Emission Reductions – Leakage <i>It is assessed whether leakage emissions are stated</i>					

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<i>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
B.7. Emission Reductions <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 ₂ e emissions per annum over the 10 years crediting period.	CAR-9	OK
B.8. Monitoring Methodology <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 0002 and is complete and transparent. The net amount of electricity dispatched 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.	CAR-3	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.9. Monitoring of Project Emissions <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 necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/	DR/I	There are no emissions from the project activity since this is a renewable energy generation project.		OK
B.10. Monitoring of Baseline Emissions <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 ₂ 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 dispatched 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		OK

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			deemed appropriate.		
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
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</i> , <i>measurement</i> and <i>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.	CAR-3	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.	CAR-3	OK
B.11. Monitoring of Leakage <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>					

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
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.12. Monitoring of Sustainable Development Indicators/ Environmental Impacts <i>It is assessed whether choices of indicators are reasonable 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.13. Project Management Planning <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.	CL-1	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.	CAR-3	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

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
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
C. Duration of the Project/ Crediting Period <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/ /7/ /9/	DR/I	The starting date of the project has been identified as 19 April 2007 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 of the project activity needs to be provided.	CL-4	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 1st October 2007.	CAR-8	OK
D. Environmental Impacts <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	/1/	DR/I	The project does not require an		OK

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Environmental Impact Assessment (EIA), and if yes, is an EIA approved?			environmental impact analysis as per the EIA notification of the MoEF.		
D.1.2. Will the project create any adverse environmental effects?	/1/ /11/	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
D.1.4. Have identified environmental impacts been addressed in the project design?	/1/ /11/	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
E. Stakeholder Comments <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/ /23/	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.	CL-5	OK
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the	/1/	DR/I	A stakeholder consultation is not required by the DNA of India.		OK

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stakeholder consultation process been carried out in accordance with such regulations/laws?					
E.1.4. Is a summary of the stakeholder comments received provided?	/1/ /24/	DR/I	The project proponent is requested to provide a summary of the comments received in the PDD.	CL-5	OK
E.1.5. Has due account been taken of any stakeholder comments received?	/1/	DR/I	The project did not receive any negative comment.		OK

Table 2b: Additional requirements checklist for VVM version 1 (EB 44)

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A.5. Letter of approval					
A.6.1. Is the LoA received directly from the DNA or through the project participant.	/1/	DR/I	The LOA has been provided by the project participant. However, it has been validated from the CDM India website (http://cdmindia.nic.in/cdmindia/projectList.jsp?search=search) that the project has indeed been approved by the DNA of India.		OK
A.6. Project design					
A.7.1. Does the PDD describe the CDM project activity with all relevant elements in a transparent and accurate way?	/1/	DR/I	Yes, the project description in the PDD is transparent.		OK
A.7.2. 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	The project activity was under construction at the time of the start of the validation.		OK
A.7.3. 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	The project is a large scale project with average annual emission reductions above 15000 tonnes CO ₂ e. Site visit has been carried out at the actual project location.		OK
A.7.4. 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 new installation and does not involve any alteration to any existing facility.		OK
A.7. Project emissions not addressed by the methodology					
A.8.1. Does the methodology describe all project emission source for the project activity that contributes all 1% of the emission reductions? Sources that the	/1/	DR/I	The project being a wind energy generation activity, there are no emissions from the project activity.		OK

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methodology considers not to take into account are not relevant (e.g. cement and iron consumption for building hydropower plants).					
A.8. Documentation of baseline emissions					
A.8.2. Documentation of the baseline determination: <ol style="list-style-type: none"> 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. All documentation is relevant as well as correctly quoted and interpreted. Assumptions and data can be deemed reasonable Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD. The methodology has been correctly applied to identify what would occurred in the absence of the proposed CDM project activity 	/1/	DR/I	<p>All assumptions used in the PDD are correctly quoted and the supporting documents have been properly interpreted.</p> <p>The assumptions regarding the PLF, project cost, O&M cost and electricity tariff are deemed reasonable</p> <p>The methodology has been correctly applied in the context of the project activity.</p> <p>National policies regarding benefits allowable to renewable energy projects have been considered and listed in the PDD.</p>		OK
A.9. Documentation of the calculations					
A.7.5. Algorithms and/or formulae used to determine emission reductions <ul style="list-style-type: none"> 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 All documentation is correctly quoted and interpreted. All values used can be deemed reasonable in the context of the project activity 	/1/	DR/I	<p>All formulae and data used in calculating the emission reductions have been correctly referred and the emission reductions have been calculated in accordance with the methodology.</p>		OK

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<ul style="list-style-type: none"> 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. 					
A.10. Implementation of the monitoring plan					
A.11.1.How were the plans for implementation of the monitoring plan, data management, QA/QC procedures assessed? To what extent can the emission reductions achieved by the project be monitored ex-post and verified later by a DOE?	/1/	DR/I	The monitoring plan described in the PDD is sufficient for accurate reporting and verification of the emission reductions from the project. The electricity generation will be cross-checked from the electricity bills as per the QA/QC procedures. The suitability of the monitoring plan has been assessed through physical verification of the monitoring system on-site.		OK
A.11. CDM consideration prior to starting date					
A.12.1.The prior consideration of CDM for the project activity complies with EB41 annex 46	/1/	DR/I	Yes. It has been demonstrated that the project proponent had prior knowledge of CDM and real and continuous actions were taken for ensuring CDM benefits		OK

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Table 3 Resolution of Corrective Action and Clarification Requests

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
CAR 1: Host Country Approval letter must be provided for verification.	A.2.2 A.2.3 A.4.1	Host country approval has been provided to the validator.	Letter of Approval from DNA of India dated 28 May 2008 has been verified by DNV. OK Accepted. CAR 1 Closed.
CAR 2: Unique identification number of the turbines needs to be provided in the PDD.	A.1.1	The unique identification number including longitude and latitude details of the turbine is incorporated in the PDD.	Necessary changes have been incorporated in revised PDD version 05. Revised PDD version 05 dated 05 September 2009 has been reviewed by DNV. OK Accepted CAR 2 Closed.
CAR 3: 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, the emergency preparedness needs to be addressed in the PDD. Day-to-day data handling procedures need to be mentioned in the PDD.	B.8.2 B.10.8 B.10.9 B.13.2	The data will be stored in hard format. Joint meter report is taken in the presence of the persons representing Enercon [Operation and Maintenance Contractor] and MSETCL. The copies of the joint meter report will be presented to the validator during the verification exercise & can be crosschecked from electricity sales invoices. The archived data will be kept for the period up to two years after the completion of the crediting period. Training procedure has been detailed	Necessary procedure for training, data archive & day to day handling of records has been incorporated in revised PDD version 05. Revised PDD version 05 dated 05 September 2009 has been reviewed by DNV. OK Accepted CAR 3 Closed.

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
		under section B.7.2 of the PDD. Enercon is an ISO certified company and the service department, which is responsible for activities related to monitoring of the data. The Operations and service procedures of Enercon are ISO certified. The procedure for day to day handling of records would be as per its ISO manual.	
CAR 4 Emission reduction calculation need to be updated based on the CEA database version applicable at the time of initial web hosting of PDD for Global Stakeholder consultation process.	B.2.6 B.5.1	The baseline is revised as per CEA version 1.1 that was available at the time of initial web-hosted PDD.	Necessary changes have been incorporated in revised PDD version 05. Revised PDD dated 05 September 2009 has been reviewed by DNV. OK Accepted CAR 4 Closed.
CAR 5 Tool to demonstrate additionality need to be update to latest version 05.2.	B.3.1	The latest tool version 5.2 is applied to demonstrate additionality in the revised PDD.	Necessary changes have been incorporated in revised PDD version 05. Revised PDD has been reviewed by DNV. OK Accepted CAR 5 Closed.
CAR 6 PP is requested to apply latest version 09 of the methodology ACM0002 as the project is not likely to be registered in version 06. As per the applied methodology ACM0002 If the project activity is the installation of a new	B.1.1 B.2.2 B.2.3 B.2.4 B.2.7	The PDD has been revised to latest version of ACM0002. Revised PDD has been submitted to DoE. We understand that the question basically seeks two clarifications	PDD has been revised to ACM0002 Version 09. Revised PDD version 05 dated 05 September 2009 has been reviewed by DNV. Alternative scenario to the project activity

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>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 & by the addition of new generation sources, reflected in CM calculation).</p> <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>A) Project not undertaken as a CDM project activity.</p> <p>B) Setting up of comparable utility scale fossil fuel fired or hydro power projects that supplies power 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</p>		<p>- Why the project alternatives are not discussed further?</p> <p>- Why hydro or gas based projects are not considered as baseline?</p> <p>Why the project alternatives are not discussed further?</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 the benchmark, then the CDM project activity cannot be considered as financially attractive.</p>	<p>has been corrected now in revised PDD version 05.</p> <p>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. 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 05 has been reviewed by DNV.</p> <p>OK.</p> <p>Accepted CAR 6 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>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>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 & by the addition of new generation sources (reflected in CM calculation).</p>		<p>In light of the above, the alternatives have not been discussed further.</p> <p>Why hydro and gas based projects are not considered as baseline?</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>The additionality tool version 5.2, step 2, “determine whether the proposed</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 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 the benchmark, then the CDM project activity cannot be considered as financially attractive.</p> <p>Further in accordance with VVM, the baseline as per applied methodology ACM0002 is fixed and there is no need to discuss the alternatives. Therefore we have limited the realistic and credible alternatives to the project activity to the following two options:</p> <ul style="list-style-type: none"> (a) The Project is not undertaken as a CDM project activity. (b) Equivalent amount of electricity 	

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>being generated through operation of grid-connected power plants and addition of new generation sources</p> <p>The PDD has been revised accordingly.</p>	
<p>CAR 7</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 however 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>Since the purchase order for the project activity has been placed in April 2007, all wind power project installed before this date need to be included for common practice.</p>	<p>B.3.1</p> <p>B.3.2</p> <p>B.3.3</p>	<p>The investment decision for the project was taken in March 2007 and purchase order was placed in April 2007. At the time of investment decision the total installed wind power capacity in Maharashtra was 1,001 MW and at the time of placing purchase order the installed capacity in Maharashtra was 1756.38 MW. We want to submit that even at the time of placing purchase order our project was not part of the common practice.</p> <p>Paragraph 4(a) 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 23 November 2003; page-5 (2.3.1)), making investment in wind</p>	<p>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 start date of the project activity 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.</p> <p>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-2002. Hence wind power projects installed prior to 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>attractive on a stand alone basis. The sales tax benefits were withdrawn in March-2002. Therefore wind capacity additions before March 2002 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 (>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>As can be seen, all comparable projects have come up only with the benefit of CDM. Hence our project is without CDM benefits is not a common practice.</p>	<p>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 05.</p> <p>Revised PDD version 05 dated 05 September 2009 has been reviewed by DNV.</p> <p>OK Accepted CAR 7 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>CAR 8</p> <p>Start date of crediting period need to be revised in PDD.</p>		<p>The start date of the crediting period is revised to 31-Jan-2010.</p>	<p>Necessary changes have been incorporated in revised PDD version 05.</p> <p>Revised PDD version 05 dated 05 September 2009 has been reviewed by DNV.</p> <p>OK Accepted</p> <p>CAR 8 Closed.</p>
<p>CAR 9</p> <p>Project proponent is requested to clarify why installed capacity of plant got reduced from 50.4 MW to 16.8 MW.</p> <p>PP is also requested to demonstrate that de-bundling of project activity will not have any impact on the additionality of the project activity.</p>	<p>A.1.2</p> <p>B.7.1</p>	<p>The project activity was initially web-hosted on 7-June-2007 for entire 50.4 MW capacity of the project activity. The project activity was scheduled to be implemented in three phases and was expected to be completed in June-2007, November-2007 and December-2007 respectively. The nodal agency clearance for the first phase of the project activity was secured in August-2007.</p> <p>The DNA approval for the project activity is contingent upon submission of the nodal agency clearance and land documents. The project activity schedule for implementation was revised according to which the second and third phase of the project activity was scheduled to be implemented in May-2008 and June-2009 respectively.</p>	<p>Initially the project proponent intended to develop the total capacity 50.4 MW as a single CDM project activity. Hence, the initial PDD was webhosted for 50.4 MW capacities on UNFCCC website. Considering the fact that the DNA of India approval is conditional upon the submission of the nodal agency clearance (MEDA), which can only be achieved once the land acquisition for all phases will be completed, project proponent decided to develop all three phases as separate CDM projects, so that the DNA approval can be secured in the phases and timely completion of the CDM registration of project activity can be achieved.</p> <p>It has been verified by DNV that the project proponent has approached DNA of India for HCA separately for all three</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>Therefore Roaring 40s management decided to spilt the PDDs in three parts on 15-February-2008 so that the CDM process is not delayed for the first phase for which the required statutory clearance are in place for requesting DNA approval. The management also decided to prepare the PDD and file the second and third phase of the project activity for DNA approval once the statutory clearance for the respective phases of the project activity are in place.</p> <p>There is one purchase order for the entire project capacity and the project was envisaged considering CDM revenues for the entire capacity. The decision to split the project into three PDD is to secure the CDM revenues for the first phase as the first phase has already being commissioned and started generation. The financial closure for the entire capacity of the project activity [50.4 MW] is also achieved by arranging the debt from HSBC. Hence splitting of the project into three PDDs does not impact the additionality of the project activity.</p>	<p>phases of the project. Since all three phases has been developed by using large scale methodology & Tool to demonstrate additionality need to be update to latest version 05.2, Hence PP can not attain any benefits in terms to demonstrate additionality due to de-bundling of project activity.</p> <p>OK Accepted CAR 9 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
		The spreadsheet for entire 50.4 MW and for first phase of 16.8 MW has been provided to the validator.	
<p>CL 1: Is EIL a project participant or Roaring 40s a project participant? Clarify Management structure and Section D.1 in the PDD needs to be clarified in case Roaring 40s are the project participant. Annex I – Clarify</p>	<p>A.2.1 B.13.1</p>	<p>Roaring 40s is the project Participant for the project activity and the details of the PP are furnished in the Annex-1 of PDD. Roaring 40s has given mandate to EIL [Enercon India Limited] for Operation & Maintenance and for CDM consultant of their project. The copy of the O&M contract and engagement letter for CDM consultancy has been provided to the validator.</p>	<p>The project participant is Roaring 40's Wind Farms (Khandke) Private Limited of India. The project is proposed as a unilateral project and no project proponent from any Annex-I Party has yet been identified. Enercon India Limited is responsible for operation & maintenance of the project activity. PDD has been corrected now & detailed Operation and management structure for monitoring has been included in section B.7.2 of the revised PDD version 05. OK Accepted CL 1 Closed.</p>
<p>CL2: Proof of CDM consideration needs to be provided. CL2 Pending Project proponent is requested to demonstrate CDM Consideration as per EB 41 Annexure 46 and evidence for the same need to be provided for verification.</p>	<p>B.3.4</p>	<p>The board resolution and Detailed Project Report prepared for the project activity has been provided to the validator which clearly indicates that CDM revenues form critical component for approving the project activity. The board resolution and Detailed</p>	<p>Following evidences to substantiate that CDM was seriously considered prior to start date of project activity has been verified by DNV. Detailed project report of 02 March 2007. Minutes of meeting of board of directors meeting dated 19 March 2007. Purchase order placed on 16 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
<ol style="list-style-type: none"> 1. Project Proponent was aware about CDM prior to start date of project activity. 2. CDM was a decisive factor to go ahead with the project activity. 3. Continuous serious actions were taken by project proponent in order to achieve CDM revenue. 		<p>Project Report has been provided to the validator.</p> <p>The project activity has been conceived as a CDM project since its inception. The Roaring 40s has considered the incentive from the CDM before the start of the project activity and the evidence for the same can be verified by the validator - Resolution passed by the Board of Directors of Roaring 40s on 19-March-2007 and confirmation from HSBC, lenders to the project. The starting date of the project activity is considered as 19-April-2007, being the date of placement of purchase order for the wind energy generators. The purchase order for the project activity was placed on 19-April-2007. The PDD was prepared in the month of May and was finally web-hosted on 7-June-2007. The ACM0002 version 6 in which the PDD was initially web-hosted on 7-June-2008 was outdated on 13-August-2008 and therefore PDD was again web-hosted with revised ACM0002 version 07 on 16-October-2008.</p>	<p>Letter from HSBC Bank (financial institution involved in project financing) dated 26 May 2009 that HSBC Bank has also considered the revenue from CDM as a part of project cash flows.</p> <p>OK Accepted CL 2 Closed.</p>
CL3:	B.3.1	Benchmark return for the project	The indicator used initially by the project

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>For bench mark reference why MERC order is not taken. Clarify?</p> <p>Financial spreadsheet needs to be provided for verification.</p> <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 (cost of debt) for the project activity.</p> <p>Project proponent is requested to use all inputs for investment analysis valid and applicable at the time of the investment decision taken by the project participant (refer EB 41 Annex 45).</p> <p>Project proponent is requested to provide following documents:</p>	<p>B.3.2</p> <p>B.3.3</p> <p>B.5.3</p>	<p>activity has been determined considering the order of Maharashtra Electricity Regulatory Commission (refer page 11 of PDD).</p> <p>Financial spreadsheet has been provided to validator for verification.</p> <p>The benchmark for the project activity has been revised in accordance with the Additionality tool and Guidance for Assessment of Investment Analysis (EB 41).</p> <p>Accordingly, Commercial lending rate of HSBC (lender to Roaring 40s project) has been considered as the appropriate benchmark in accordance with para 6(b) sub step 2(b) of the Additionality tool. The additionality of the project has therefore been evaluated against a benchmark of 12.5% post tax project IRR.</p> <p>The input values to the investment analysis are revised in accordance with the data that was available to the project proponent at the time of decision</p>	<p>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 had revised the benchmark for the project activity. The investment decision for the project activity was taken based on the DPR of 02 March 2007, which clearly discusses that the loan for the project activity will be provided by HSBC bank. Hence the project proponent has considered commercial lending rate of 12.5% quoted by HSBC (lender for the project activity) as the benchmark for the project activity. It has been verified by DNV from confirmation letter from HSBC bank dated 26 May 2009 that the project activity was evaluated by lender against applied benchmark of 12.5%.from and without CDM revenues. DNV confirms that this benchmark is inline with the EB</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
<ul style="list-style-type: none"> • HSBC loan documents need to be provided for verification. • CDM revenue was considered while evaluating the project for financing from HSBC bank need to be provided for verification. • Copy of PPA need to be submitted for verification. • Project proponent is requested to provide source for Working capital considered for the project activity. • Project proponent is requested to provide source for PLF considered for the project activity at the time of investment decision. • Power curve for the Machines need to be provided for verification. <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. Project proponent is requested to clarify how the tariff after the end of PPA has been arrived at and evidence for the same need to be provided for verification and same need to be incorporated in PDD.</p>		<p>making.</p> <p>The letter from HSBC stating the loan assumptions and consideration of the CDM revenues has been provided to validator for review.</p> <p>The copy of PPA has been submitted to the validator.</p> <p>There is no loan for the working capital and hence working capital is removed from the financial workings.</p> <p>The project proponent has taken the PLF from the generation estimate provided by Enercon India Limited. The copy of the generation estimate has been provided to the validator.</p> <p>The power curve of the machine has been provided to the validator.</p> <p>Sensitivity Analysis</p> <p>The investment in wind power project shall be tested based on three parameters:</p> <ul style="list-style-type: none"> • Capital Cost • Tariff • Plant Load Factor 	<p>guidance on Investment analysis (Para 11 which states that local commercial lending rates are appropriate benchmark for project IRR).</p> <p>Project proponent has conducted a sensitivity analysis considering a $\pm 10\%$ 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 & 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 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>

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>PP is also requested to clarify why electricity tariff, O & M cost & project cost has not been considered for sensitivity analysis and justification for the same need to be included in PDD.</p>		<ul style="list-style-type: none"> • O&M cost <p>Capital Cost</p> <p>In accordance with the investment guidance, the additionality for the project activity is demonstrated at the time of decision making. The price is taken from the detailed project report that is based on the final negotiated offer from Enercon. The price bid was final price given by Enercon. The price given in the detailed project note can be crosschecked from the purchase order for verification. Therefore, it is considered appropriate not to conduct sensitivity on the project cost.</p> <p>Tariff</p> <p>Maharashtra state electricity commission has fixed the tariff for the period of 13 years. The tariff is subject to change at the end of the term of PPA. The tariff order states that the consumer will be eligible for the lower tariff after the debt obligation of the project is fulfilled. The excerpts from the tariff</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>order are as follows:</p> <p><i>“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”</i></p> <p>The sale income needed and sale income approved by the commission have a differential amount of INR 6.317 Million which is required to be adjusted in the latter year to keep it consistent with the fixed return provided by the commission. Therefore to arrive at the tariff that may be applied by the commission at the end of the 13th year will be computed after adjusting the surplus provided by the commission.</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 tariff from the 13th year onwards therefore shall be adjusted for the surplus provided by the regulator in the initial years.</p> <p>On computation the average tariff after 13th year onwards based on MERC assumptions works out to be INR 1.80 per unit. On the upside if MERC does not consider adjustment of the surplus gained which is extremely unrealistic, the average tariff will be INR 2.34 per Unit. For the purpose of substantiating additionality, the project proponent has conducted sensitivity assuming the tariff of INR 2.34 per unit of electricity generated.</p> <p>Plant Load Factor</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</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>PLF of the project activities that are operating in the district of Ahmednagar is 19.07% in 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 19.62%. Plant load factor for the project activity provided by Enercon India Limited is 20.7%. Sensitivity analysis of the Project IRR is therefore carried out at 23.50% (P-25 level) which is very unlikely to be achieved considering maximum of the highest observed PLF in the district of Ahmednagar, 10% increase over the PLF given by MERC in tariff order dated 23-Nov-2003 and generation estimate given by Enercon India Limited at P-25 level [Max (19.62%, 22%, 23.5%)]. The return that the project is expected to generate at PLF of 23.50 % is 10.52%, which is less than the benchmark.</p>	
CL4: Proof of start date of the project activity needs	B.3.4	The purchase order constitutes the first real action towards the project activity, which is assumed as the start date for	Purchase order placed dated 19 April 2007 has been verified by DNV. Purchase order date has been accepted by

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.		the project activity. The purchase order has been submitted to validator for verification.	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 4 Closed.
CL5: How stake holders were invited for comments? Provide proof of advertisement. The minutes of the stakeholders meeting needs to be provided for verification. Summary of stakeholder's comment need to be incorporated in PDD and PP is requested to clarify how the stakeholder's have been addressed?	E.1.1 E.1.4	The stakeholders were intimated via a local newspaper advertisement in Sarvmat dated 29 October 2006. The local stakeholder consultation meeting had representatives from the nearby villages and representatives of Enercon [technology provider and O&M contractor]. The minutes of the meeting are set out in Appendix 2 of the PDD.	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 5 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)

<i>GHG Auditor:</i>	Yes				
<i>Technical Area</i>	<i>CDM Validator</i>	<i>CDM Verifier</i>	<i>Sector Expert</i>	<i>Methodology Expert</i>	<i>Technical Reviewer</i>
<i>Landfill gas</i>					
<i>Hydro power</i>	Aug 2009	Aug 2009			
<i>Renewables Wind power</i>	Jan 2009	Jan 2009			
<i>Other renewable</i>		Sept 2009			
<i>Biomass</i>					
<i>Grid connection of isolated system</i>		Sept 2009			
<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>	Jan 2009	Sept 2009			
<i>N₂O</i>					
<i>HFCs</i>					
<i>Flare reduction</i>					
<i>PFCs</i>					
<i>Charcoal</i>					
<i>CO₂ recovery</i>					
<i>Transport</i>					
<i>Non-renewable biomass</i>					
<i>Biofuel</i>					
<i>Pipeline leakage reduction</i>					
<i>SF₆</i>					

Høvik, 8 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)

<i>GHG Auditor:</i>	Yes				
<i>Technical Area</i>	<i>CDM Validator</i>	<i>CDM Verifier</i>	<i>Sector Expert</i>	<i>Methodology Expert</i>	<i>Technical Reviewer</i>
<i>Landfill gas</i>					
<i>Hydro power</i>					
<i>Renewables</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>N₂O</i>					
<i>HFCs</i>					
<i>Flare reduction</i>					
<i>PFCs</i>					
<i>Charcoal</i>					
<i>CO₂ recovery</i>					
<i>Transport</i>					
<i>Non-renewable biomass</i>					
<i>Biofuel</i>					
<i>Pipeline leakage reduction</i>					
<i>SF₆</i>					

Høvik, 5 November 2009

Michael Lehmann

Michael Lehmann

Technical Director, Climate Change Services



CERTIFICATE OF COMPETENCE

Ramesh Ramachandran

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

<i>GHG Auditor:</i>	Yes				
<i>Technical Area</i>	<i>CDM Validator</i>	<i>CDM Verifier</i>	<i>Sector Expert</i>	<i>Methodology Expert</i>	<i>Technical Reviewer</i>
<i>Landfill gas</i>	Jan 2009	Jan 2009	Jan 2009		
<i>Renewables</i>	<i>Hydro power</i>	Jan 2009	Jan 2009		
	<i>Wind power</i>	Jan 2009	Jan 2009	Jan 2009	Jan 2009
	<i>Other renewable</i>	Jan 2009	Jan 2009		
<i>Biomass</i>	Jan 2009	Jan 2009			
<i>Grid connection of isolated system</i>	Jan 2009	Jan 2009			
<i>Cement</i>	Jan 2009	Jan 2009			
<i>Waste-heat / waste-gas recovery</i>	Jan 2009	Jan 2009			
<i>Efficiency of thermal power plants</i>	Jan 2009	Jan 2009			
<i>Coal mine methane</i>	Jan 2009	Jan 2009			
<i>Fuel switch</i>	Jan 2009	Jan 2009			
<i>Manure management</i>	Jan 2009	Jan 2009			
<i>Waste / wastewater treatment</i>	Jan 2009	Jan 2009	Jan 2009		
<i>Energy efficiency</i>	Jan 2009	Jan 2009			
<i>N₂O</i>	Jan 2009	Jan 2009			
<i>HFCs</i>	Jan 2009	Jan 2009			
<i>Flare reduction</i>	Jan 2009	Jan 2009			
<i>PFCs</i>	Jan 2009	Jan 2009			
<i>Charcoal</i>	Jan 2009	Jan 2009			
<i>CO₂ recovery</i>	Jan 2009	Jan 2009			
<i>Transport</i>	Jan 2009	Jan 2009			
<i>Non-renewable biomass</i>	Jan 2009	Jan 2009			
<i>Biofuel</i>	Jan 2009	Jan 2009			
<i>Pipeline leakage reduction</i>	Jan 2009	Jan 2009			
<i>SF₆</i>	Jan 2009	Jan 2009			

Høvik, 9 January 2009

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