



VALIDATION REPORT

Tungabhadra wind power project in Karnataka, India

REPORT No. 2007-1022

REVISION No. 02



VALIDATION REPORT

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DNV CERTIFICATION AS

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Approved by: Mari Grooss Viddal, Head of Section Norway	Organisational unit: DNV Certification, International Climate Change Services
Client: Enercon India Limited	Client ref.: A. Raghavan

Project Name: Tungabhadra wind power project in Karnataka
Country: India
Methodology: ACM0002
Version:
GHG reducing Measure/Technology: Wind based renewable energy power project
ER estimate: 49 331 tCO₂e per year

Size

☒ Large Scale

☐ Small Scale

Validation Phases:

☒ Desk Review

☒ Follow up interviews

☒ Resolution of outstanding issues

Validation Status

☒ Corrective Actions Requested

☒ Clarifications Requested

☒ Full Approval and submission for registration

☐ Rejected

In summary, it is DNV's opinion that the *Tungabhadra wind power project in Karnataka* in India, as described in the PDD of 15 January 2008, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0002. The PDD also reflects the corrections requested by EB36 in their decision 61 (z). DNV thus requests the registration of the project as a CDM project activity.

Report No.: 2007-1022	Date of this revision: 2008-02-06	Rev. No. 02
Report title: Tungabhadra wind power project in Karnataka in India		
Work carried out by: Ma-Paa-Puratchikkanal, Michael Lehmann		
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Key words:

Climate Change

Kyoto Protocol

Validation

Clean Development Mechanism

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Abbreviations

BM	Build Margin
CEF	Carbon Emission Factor
CEA	Central Electricity Authority of India
CERC	Central Electricity Regulatory Commission
CO ₂	Carbon dioxide
CO _{2e}	Carbon dioxide equivalent
DNV	Det Norske Veritas
EIL	Enercon India Limited
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
KERC	Karnataka Electricity Regulatory Commission
KPTCL	Karnataka Power Transmission Corporation Limited
KREDL	Karnataka Renewable Energy Development Limited
MESCOM	Mangalore Electricity Supply Company Limited
MNES	Ministry of Non-conventional Energy Sources
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
PLF	Plant Load Factor
PPA	Power Purchase Agreement
RERC	Rajasthan Electricity Regulatory Commission
UNFCCC	United Nations Framework Convention for Climate Change
WEC	Wind Energy Converter



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1 EXECUTIVE SUMMARY – VALIDATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a validation of the “Tungabhadra wind power project in Karnataka” in India. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host country 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 fulfillment of stated criteria.

The host country is India. No Annex I country has yet been identified. India fulfils the participation criteria and has approved the project and authorized the project participants. The DNA from India confirmed that the project assists in achieving sustainable development.

The project correctly applies ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, version 06.

By generating electricity from wind sources, 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 49 331 tCO₂e per year over the selected 10 year 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.

Adequate training and monitoring procedures have been implemented.

In summary, it is DNV’s opinion that the “Tungabhadra wind power project in Karnataka” in India, as described in the PDD of 15 January 2008, meets all relevant UNFCCC requirement for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0002, version 06. DNV thus requests the registration of the project as a CDM project activity.



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2 INTRODUCTION

The Enercon (India) Limited (EIL) has commissioned DNV to perform a validation of the *Tungabhadra wind power project in Karnataka* in India (hereafter called “the project”). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, and the subsequent decisions by the CDM Executive Board. The report also incorporates the corrections requested by EB36.

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)/1/. 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. The validation team has, based on the recommendations in the Validation and Verification Manual/3/ employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

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



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3 METHODOLOGY

The validation consists 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/ EIL CDM PDD: Tungabhadra wind power project in Karnataka, Version 04, dated 15 January 2008 and its previous version
- /2/ Ministry of Environment and Forest (DNA of India): Letter of Approval dated 4 June 2007.
- /3/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. <http://www.vvmanual.info>
- /4/ EIL: *Financial analysis EWFTL-DNV.xls*
- /5/ EIL: *Power Purchase Agreement* with MESCOM dated 16 August 2006
- /6/ EIL: *Land Lease Agreement with Karnataka Forest Department*, 23 September 2006
- /7/ EIL: *Emission Reduction Purchase Agreement with KfW, Germany* dated 3 May 2006.
- /8/ Aditya Environmental Services Private Limited: *Rapid Environmental Impact Assessment study for proposed wind farms* in Gadag district dated November 2006.
- /9/ ACM0002: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 06, sectoral scope 01, dated 19 May 2006.
- /10/ CDM Executive Board: *Tool for the demonstration and assessment of additionality*. Version 03.
- /11/ KERC: *Tariff order* dated 18 January 2005.
- /11a/ Central Electricity Regulatory Commission: *Order on determination of terms and conditions of tariff*, dated 16 January 2004.

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

- The PDD has been revised in line with the CEA published baseline emission factor for the southern regional grid of India.



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3.2 Follow-up Interviews with Project Stakeholders

Identify any personnel who have been interviewed and/or provided additional information to the presented documentation.

	Date	Name	Organization	Topic
/12/	2007-01-03	Mr. Thyagarajan	Enercon (India) Limited	<ul style="list-style-type: none"> • Commissioning of the project activity • Stakeholder's consultation process • Energy meter recording practices • Barriers faced by the project
/13/	2007-01-03	Mr. Vivek Sen	Enercon (India) Limited	<ul style="list-style-type: none"> • Start date of the project activity • Emission reduction calculations • Additionality and barrier analysis
/14/	2007-01-03	Mr. Ashok Shinde	Enercon (India) Limited	<ul style="list-style-type: none"> • Monitoring and verification practices • Training to the personnel • Environmental and community development activities

3.3 Resolution of Outstanding Issues

The objective of this phase of the validation is to resolve any outstanding issues which need 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 a transparent manner the 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 Tungabhadra wind power project in Karnataka is enclosed in Appendix A to this report.

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

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

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

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



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3.4 Internal Quality Control

The draft validation report including the initial validation findings underwent a technical review before being submitted to the project participants. The final validation report underwent another 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.

3.5 Validation Team

Role/Qualification	Last Name	First Name	Country
Team Leader/ GHG Auditor	Puratchikkanal	Ma-Paa	India
Technical Reviewer/ CDM Validator	Kumaraswamy	Chandrashekara	India
Sector Expert	Lehmann	Michael	Norway

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

4 VALIDATION FINDINGS

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

The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation /1/.

4.1 Participation Requirements

The project participant is the private entity "Enercon (India) Limited" of India. The project is proposed as a unilateral project and no Annex-I country has yet been identified. The host country India has ratified the Kyoto Protocol and meets all the requirements for participating in a CDM project. The project doesn't involve any official development fund diversion for its activity. The Ministry of Environment and Forests, the DNA of India has approved the project with a letter of approval dated 4 June 2007/2/, which also confirms that the project assists in achieving sustainable development in India.

4.2 Project Design

The wind farm of EIL has an installed capacity of 22.8 MW and the entire power generated is being exported to the state grid maintained by Karnataka Power Transmission Corporation Limited (KPTCL) which is a part of southern regional electricity grid.

The project activity involves installation of 38 of E-40 type 600kW rated Wind Energy Converters (WECs). These WECs are manufactured, installed and maintained by EIL. The salient features of the project include gearless construction, variable speed and pitch functions and independent braking technology. The project design thus reflects good practice. The WEGs are set-up at Singatalur, Koralahalli and Hammigi villages of Mundargi Taluk in Gadag District of Karnataka.



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The power generated from the project is directly fed to the state grid which is part of the southern regional grid thereby replacing an equivalent amount of fossil fuel based power generation. Therefore the project activity results in an equivalent amount of CO₂ emission reduction which otherwise would have resulted from fossil fuel combustion.

The starting date of the project activity is 1 January 2007 which is the date of commencement of the construction works. The lifetime of the project activity is 20 years and this is considered as reasonable. The project has selected a fixed crediting period of 10 years starting from 15 October 2007.

The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA.

4.3 Baseline Determination

The project has applied the approved consolidated baseline methodology ACM0002, version 6 dated 19 May 2006/12/. ACM0002 is applicable to grid connected renewable electricity generation projects. Since the project involves grid connected renewable energy generation from wind power, the methodology is applicable to the project activity.

The discussion of the baseline selection has been done in a transparent manner. Electricity generation by the existing grid connected power plants have been selected as the baseline. The emission reductions occurring are calculated from the electricity generation through renewable sources, multiplied by the relevant emission factor of the selected grid. As the project activity is dispatching the generated power to the Karnataka state grid, which is a part of the southern regional grid; the baseline factor for this project activity is the generation mix of southern regional grid. Baseline emission factor for the southern regional grid is established *ex-ante* based on approved methodology ACM0002 using a combined margin approach.

EIL has used the operating margin (OM) and build margin (BM) data published in the CEA¹ database, for calculating the baseline emission factor. The Central Electricity Authority, Ministry of Power, Government of India has published a database of CO₂ emission factors from the power sector in India based on detailed authenticated information obtained from all operating power stations in the country. This database i.e. the 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 and the BM is calculated *ex ante* based on 20% most recent capacity additions in the grid based on net generation as described in ACM0002. The average of the OM for the three years 2002-03, 2003-04 and 2004-05 has been determined and verified to be 1.003 tCO₂e/MWh and the BM to be 0.72 tCO₂e/MWh. The weighted average of the “operating margin” and the “build margin” emission coefficient for southern regional grid of India has thus been determined to be 0.93 tCO₂e/MWh (fixed *ex-ante*). In the determination of the combined margin the project proponent has opted for a weight consideration of 75:25 as applicable to the wind power projects.

¹ CO₂ Baseline Database, <http://cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm>



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4.4 Additionality

The project's additionality is demonstrated using the "Tool for the demonstration and assessment of additionality", version 03/10/.

Step 1: Identification of alternatives to the project activity consistent with current laws and regulations

Sub-step 1a: Define alternatives to the project activity:

Three alternatives to the project activity have been considered as the baseline scenario. These are i) the project not undertaken as a CDM project activity ii) Setting up of equivalent capacity of fossil fuel or hydro power based plants and supply electricity to the Karnataka grid and ii) continuation of current scenario without the project activity.

Outcome of Step 1a: Alternatives i) and ii) have been identified as credible alternatives.

Sub-step 1b: Consistency of applicable laws and regulations:

All the alternatives are in compliance with the laws and regulations of India.

Outcome of Step 1b: The chosen alternatives are consistent with applicable laws and regulations.

Step 2: Investment analysis:

Sub-step 2a: Determine appropriate analysis method

To demonstrate the additionality of the project, EIL have chosen Option III – Benchmark analysis.

Sub-step 2b: Benchmark analysis:

The bench mark chosen is the post tax return on Equity of 16% as per the Karnataka Electricity Regulatory Commission order dated 18 January 2005 /11/. This post tax return on equity has been established by KERC on consideration of assumptions on capital cost, operation cost, PLF, financing and taxation criteria. This benchmark is deemed appropriate as Central Electricity Regulatory Commission, the nodal government agency for electricity generation, transmission and distribution activities in the power sector in India, under the Electricity Act 2003, and the Karnataka Electricity Regulatory Commission (KERC), both have stipulated that a post tax equity return of 16% can be considered as appropriate for Independent Power Producers (IPPs) /11/ /11a/.

Sub-step 2c: Calculation and comparison of financial indicators

To demonstrate the additionality of the project, EIL have used the equity IRR as a basis to assess the financial attractiveness of the project activity/4/. It has been demonstrated that the equity IRR of the project activity without CDM revenues is 10.9% which is lower than the benchmark equity IRR of 16% for independent power producers (IPP) as per KERC order. It has been demonstrated that the equity IRR is lower than the bench mark, because the bench mark equity IRR of 16% has been established by KERC based on the capital cost assumption of Rs. 42.5 million/MW whereas the project capital cost of the project activity is estimated at Rs. 47.4 million/MW.

A sensitivity analysis has also been performed with $\pm 5\%$ change in PLF. With a 5% increase in PLF, the equity IRR becomes 12.9%. This is also below the chosen benchmark of equity IRR of 16%.

The financial analysis and the benchmarks have been verified by DNV and found to be appropriate.



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Outcome of Step 2: The equity IRR for the project activity is 10.9%, which is well below the bench mark equity IRR of 16%. The Step 2 is satisfied.

Step 3: Barrier analysis:

Not chosen.

Step 4: Common practice analysis:

This has been demonstrated based on the fact that as per the data from 'CEA General Review 2006' the energy generation by wind power plants in Karnataka state for the financial year between 31 April 2004 to 31 March 05 was 485.57 GWh as against the total generation of 33523.92 GWh. This works out to be around 1.45% and cannot be considered as a common practice scenario in the region. Moreover, it has also been demonstrated that as on 31 March 2005, out of the total 276 MW wind power project capacity established in Karnataka, 201 MW are already in the pipeline for CDM approval or approved and more are following.

4.5 Monitoring

The monitoring methodology selected complies with requirements of ACM0002, version 6/9/.

4.5.1 Parameters determined ex-ante

The baseline carbon emission factor of the southern regional grid is determined from the published data of CEA and is fixed ex-ante. The operating margin (OM) has been calculated from the emission data of 2002-03, 2003-04 and 2004-05. These are the three most recent years for which the data is available from CEA. The OM has been determined and verified to be 1.003 tCO₂e/MWh and the BM to be 0.72 t CO₂e/MWh. The weighted average of the "operating margin" and the "build margin" emission coefficient for southern regional grid of India has thus been determined to be 0.932 tCO₂e/MWh and fixed *ex-ante* for the entire crediting period.

4.5.2 Parameters monitored ex-post

The net amount of electricity dispatched by the WEGs to the KPTCL grid will be monitored continuously. The net energy generated that is to be recorded in the form of Joint Meter Reading (JMR), that would be signed off by both the proponents and the KPTCL officials. This JMR is certified by the KPTCL executive engineer and is the authentic data used for preparation of invoices. Thus, the net electricity exported to the grid will be reported on a monthly basis and cross-checked with the invoices raised to KPTCL. 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 EIL. The project management structure, authorities for reporting and quality assurance have been entrusted to a CDM team with the decision making authority vested with the Managing Director of EIL. The electricity meters installed under the project activity are approved by the KPTCL and deemed appropriate. The meters will be calibrated at a regular frequency. All the main and the check meters have been proposed to be tested for accuracy at regular intervals against 0.2 class accuracy levels. The electricity generation reports on joint meter reading are generated by KPTCL and send to EIL on monthly basis. The monthly electricity receipts from KPTCL will



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also be archived until 2 years after the crediting period to facilitate cross-checking during the crediting period.

4.6 Estimate of GHG Emissions

The project being a wind energy generation project, there are no project emissions or leakages due to the project activity.

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 ex-ante, as reported under section 4.3 of this report.

The electricity displaced from the grid by the project activity has been based on actual generation figures for the WEGs prior to the crediting period. The actual generation data from the project as obtained from the monthly generation details provided by the KPTCL for a one year period has been used to estimate the electricity generation from the project during the crediting period.

The emission reductions from the project are real and measurable. Provided the underlying assumptions do not change, the project is likely to reduce 49 331 t CO₂ e per year during its 10 years crediting period starting from 15 October 2007.

4.7 Environmental Impacts

The project does not require an environmental impact analysis as per the EIA notification of the MoEF. However, a rapid EIA/8/ has been conducted by EIL which has adequately described the environmental impacts of the project and also assessed the feed back from the local stakeholders. The project is not likely to create any adverse environmental effects. The project complies with environmental regulations in India.

4.8 Comments by Local Stakeholders

The local stakeholders were invited for comments through news paper advertisement in Vijaya Karnataka dated 4 June 2006 and also by arrangements made by the village panchayat. Meeting was conducted on 15 June 2006 in Dhoni Panchayat office, of Mundaragi, Taluk in Gadag district. The stakeholders posed questions on employment opportunities, plantation work carried out by EIL, impact on ground water, generation capacity of wind mills, expressed concern on any untoward accident of forest fire and provision of basic facilities to the villages apart from suggesting plantations of medicinal plants in the region.

EIL have addressed the queries that plantation work is being carried out by EIL as per the agreement with KREDL, ground water doesn't get impacted because of wind mills and have ensured that proper security arrangements have been made to check the forest fire occurrence, if any. The project did not receive any negative comment.

4.9 Comments by Parties, Stakeholders and NGOs

The PDD of 15 November 2006 was made publicly available on DNV's climate change website(<http://www.dnv.com/certification/climatechange/Projects/ProjectDetails.asp?ProjectId=878>) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 01 December 2006 to 30 December 2006.



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No comments were received.



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APPENDIX A

CDM VALIDATION PROTOCOL



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Table 1 Mandatory Requirements 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.	CAR-1 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 OK
4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	CAR-1 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



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Requirement	Reference	Conclusion
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		
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	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
For large-scale projects only		
12. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	OK
About stakeholder involvement		
13. 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	OK
14. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project	CDM Modalities and Procedures §40	OK



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Requirement	Reference	Conclusion
design document and comments have been made publicly available.		
Other		
15. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
16. 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
17. 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
18. The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK
19. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	OK



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Table 2 Requirements Checklist

CHECKLIST QUESTION		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
* MoV = Means of Verification, DR= Document Review, I= Interview						
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/ /5/ /6/	DR/I	<p>The project has installed 38 Wind Energy Converters (WECs) of E-40 type 600 kW rating in Gadag District of Karnatkaka, India. These WECs are manufactured, installed and maintained by EIL. The salient features of the project include gearless construction, variable speed and pitch functions and independent braking technology. The project design thus reflects good practice. The WEGs are set-up at Singatalur, Koralahalli and Hammigi villages of Mundargi Taluk in Gadag District of Karnataka.</p> <p>The unique identification of each turbine needs to be provided in the PDD.</p> <p>Provide village-wise installed turbine details for verification.</p>	CL-4 CL-5	OK

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A.1.2. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/	DR	Yes, the project's system boundaries are defined clearly. It includes the wind energy generators and the southern regional electricity grid to which the generated power is dispatched.		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>					
A.2.1. Which Parties and project participants are participating in the project?	/1/	DR/I	The project participant is the private entity "Enercon (India) Limited" of India. India is the host country. No Annex-I country has been identified as yet. It shall be clarified whether Enercon GmbH, Germany, is a project participant?	CL-2	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	The Ministry of Environment and Forests, the DNA of India has approved the project. The letter of approval is to be submitted to the DNV.	CAR-1	OK

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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/	DR	India has ratified the Kyoto protocol on 26 August 2002. The Ministry of Environment and Forests is the DNA of India		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/ 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/	DR/I	The WECs 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-40 models implemented under the project activity include gearless construction, variable speed and pitch functions and		OK

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				independent braking technology. The project design thus reflects good practice.		
A.3.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/	DR/I		The E-40 models used in the project are likely to result in significantly better performance than the commonly used WECs 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 WECs have been taken care by EIL. This ensures proper maintenance and operation of the WECs 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 of India Is to be submitted to DNV.	CAR-1	OK
A.4.2. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR/I		The project will help to decrease the dependence on fossil fuels for power generation. The project activity will create employment		OK

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				opportunities during construction and also operation phases.		
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/ /9/	DR		Yes, the project applies the approved consolidated baseline methodology ACM0002, version 6.		OK
B.1.2. Are the applicability criteria in the baseline methodology all fulfilled?	/1/ /9/	DR		Yes, the selected baseline methodology ACM0002 is applicable to the project activity as the project provides grid connected renewable power generation through capacity addition from wind sources.		OK
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/	DR		The baseline scenario is the continuation of		OK

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				current scenario, i.e. the electricity displaced by the project would have been generated by the operation of grid-connected power plants or by the addition of new generation sources.		
B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/	DR		Other than the baseline scenario, the option of setting up a fossil fuel based power plant or hydro power plant and project without CDM benefits have been discussed. However, coal based power plant option has not been considered as the baseline since this option would have required considerable amount of investment as compared to the baseline which do not require any investment at all. Also this option would have led to 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		OK
B.2.3. Has the baseline scenario been determined according to the methodology?	/1/	DR		Yes. The baseline as been determined as per the methodology.		OK
B.2.4. Has the baseline scenario been determined using	/1/	DR		The discussion of the baseline selection has		OK

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conservative assumptions where possible?			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. The emission factors are varying from CEA published data and needs to be reconsidered as per CEA data.	CAR-3	
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	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/	DR	Yes, the baseline scenario selection is compatible with available data.		OK
B.2.7. Have the major risks to the baseline been identified?	/1/	DR	There are no risks to the baseline		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>					

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B.3.1.	Is the project additionality assessed according to the methodology?	/1/ /4/ /5/ /10/	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 Emission Purchase Agreement for verification.</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 equivalent capacity of fossil fuel or hydro power based plants and supply electricity to the Karnataka 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</p>	CL-4	OK

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			<p>since this option results in lower baseline emissions than the coal based power plant option.</p> <p>Step 2: Investment analysis: To demonstrate the additionality of the project, EIL have chosen Option III – Bench mark analysis.</p> <p>The bench mark chosen is the post tax return on Equity of 16% as per the Karnataka Electricity Regulatory Commission order dated 18 January 2005.</p> <p>It has been demonstrated that the equity IRR of the project activity without CDM revenues is 10.9% which is lower than the benchmark equity IRR of 16% for independent power producers (IPP) as per CERC order. The IRR improves to 15.50 % with CDM revenues.</p> <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>CAR-4</p> <p>CAR-4</p>	

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			<p>Step 3: Not chosen.</p> <p>Step 4: Common practice analysis: This as been demonstrated on the fact that as per the data of 'CEA General Review 2006' the energy generation by wind power plants in Karnataka for the year 2004-05 was 485.57 GWh as against the total generation of 33523.92 GWh. This works out to be around 1.45% 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 276 MW wind power projects established in Karnataka, 201 MW are already in the pipeline for CDM and more are being followed.</p> <p>Step 5: Impact of CDM registration: The CDM benefits increases the equity IRR of the project by 4.6% thus providing the project with necessary financial back-up.</p>		
B.3.2. Are all assumptions stated in a transparent and conservative manner?	/1/	DR/I	The PLF of the wind project has been assumed to be 26.5% while calculating the		OK

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			IRR. This is deemed conservative as against the actual PLF realized by wind plants in the region.		
B.3.3. Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR	Financial spread sheet need to be provided for verification.	CAR-4	OK
B.3.4. If the starting date of the project activity is before the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?	/1/	DR/I	The starting date of the crediting period is after the date of registration of the project as a CDM project activity. Hence the project does not seek retro-active credits. EIL have formulated an Emission Reduction Purchase Agreement with the buyer. The ERPA needs to be provided for verification.	CL-4	OK
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	The project being a wind energy generation project, there are no emissions from the project activity.		OK

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B.4.2. Have conservative assumptions been used when calculating the project emissions?	/1/	DR	Refer B.4.1		OK
B.4.3. Are uncertainties in the project emission estimates properly addressed?	/1/	DR	Refer B.4.1		OK
B.5. Calculation of GHG Emission Reductions – Baseline 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/	DR	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> . However, the project proponent is requested to consider the published OM and BM data provided by the CEA to calculate the CM.	CAR-3	OK
B.5.2. Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	Yes.		OK

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B.5.3. Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	Yes.		OK
B.6. Calculation of GHG Emission Reductions – Leakage <i>It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.6.1. Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	The project being a wind energy generation project, there are no leakages due to the project activity		OK
B.6.2. Have conservative assumptions been used when calculating the leakage emissions?	/1/	DR	Refer B.6.1		OK
B.6.3. Are uncertainties in the leakage emission estimates properly addressed?	/1/	DR	Refer B.6.1		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>					

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B.7.1. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.	/1/	DR	Yes, the emission reductions are real and measurable. The project will reduce 49 331 tCO ₂ e emissions per year over the 10 years crediting period		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/ /9/	DR/I	The monitoring methodology selected complies with requirements of ACM0002, version 6. The net amount of electricity despatched by the WECs to the KPTCL grid will be monitored continuously. The net electricity exported to the grid will be reported on monthly basis and cross-checked with the invoices raised to KPTCL.		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	The project proponent is requested to clarify the data archiving method and period in the PDD.	CAR-5	OK
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>					

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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	There are no emissions from the project activity since this is a renewable energy generation project		OK
B.9.2. Are the choices of project GHG indicators reasonable and conservative?	/1/	DR	Refer B.9.1		OK
B.9.3. Is the measurement method clearly stated for each GHG value to be monitored and deemed appropriate?	/1/	DR	Refer B.9.1		OK
B.9.4. Is the measurement equipment described and deemed appropriate?	/1/	DR	Refer B.9.1		OK
B.9.5. Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR	Refer B.9.1		OK
B.9.6. Is the measurement <i>interval</i> identified and deemed appropriate?	/1/	DR	Refer B.9.1		OK
B.9.7. Is the <i>registration, monitoring, measurement and reporting</i> procedure defined?	/1/	DR	Refer B.9.1		OK

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B.9.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR	Refer B.9.1		OK
B.9.9. 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	Refer B.9.1		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/, /9/	DR	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	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	The net amount of electricity dispatched by the WECs to the KPTCL grid will be monitored continuously. The net electricity exported to the grid will be reported on		OK

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			monthly basis and cross-checked with the invoices raised to KPTCL.		
B.10.4. Is the measurement <i>equipment</i> described and deemed appropriate?	/1/	DR	The electricity meters installed under the project activity are approved by the KPTCL and deemed appropriate		OK
B.10.5. Is the measurement <i>accuracy</i> addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR	Yes.		OK
B.10.6. Is the measurement <i>interval</i> for baseline data identified and deemed appropriate?	/1/	DR	Yes.		OK
B.10.7. Is the registration, <i>monitoring, measurement and reporting</i> procedure defined?	/1/	DR	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	Yes.		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	The electricity generation reports on joint meter reading are generated by KPTCL and EIL on monthly basis. The project proponent is requested to clarify the archiving details for the monthly electricity sales receipts from KPTCL.	CAR-5	OK

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B.11. Monitoring of Leakage <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>					
B.11.1.Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR	Leakage monitoring is not required for this project activity.		OK
B.11.2.Are the choices of project leakage indicators reasonable and conservative?	/1/	DR	Refer B.11		OK
B.11.3.Is the measurement method clearly stated for each leakage value to be monitored and deemed appropriate?	/1/	DR	Refer B.11		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	The DNA of India does not mandate the monitoring of sustainable development indicators.		OK
B.12.2.Does the monitoring plan provide for the	/1/	DR	Refer B.12		OK

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collection and archiving of relevant data concerning environmental, social and economic impacts?					
B.12.3. Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1/	DR	Refer B.12		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	The responsibility of overall project management lies with EIL.		OK
B.13.2. Are procedures identified for training of monitoring personnel?	/1/	DR	The monitoring of the WEC performance has been taken care by EIL.		OK
B.13.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR/I	No emergencies due to the project activity will lead to unintended GHG emissions.		OK
B.13.4. Are procedures identified for review of reported results/data?	/1/	DR/I	Yes. EIL will be responsible for the review of reported results.		OK

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B.13.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?		/1/	DR/I	Yes.		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/	DR	Yes, the starting date of the project is 10 March 2006, the date of placement of purchase order. The lifetime of the project has been identified as 20 years. This is deemed reasonable		OK
C.1.2. Is the start of the crediting period clearly defined and reasonable?		/1/	DR	The project has selected a crediting period of 10 years starting from 15 October 2007. Since the crediting period for the project cannot start prior to the registration of the project, the project proponent is requested to delay the starting date of the crediting period.	CAR-6	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. Has an analysis of the environmental impacts of the project activity been sufficiently described?		/1/ /5/ /6/	DR	The project does not require an environmental impact analysis as per the EIA		OK

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		/8/		notification of the MoEF. However, an REIA was conducted by EIL. The statutory approvals and clearances need to be provided for verification. The EIA and EMP parameters need to be mentioned in the PDD.	CAR-2 CL-3	
D.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?		/1/	DR	The project does not require an environmental impact analysis as per the EIA notification of the MoEF		OK
D.1.3. Will the project create any adverse environmental effects?		/1/	DR/I	The project is not likely to create any adverse environmental effects.		OK
D.1.4. Are transboundary environmental impacts considered in the analysis?		/1/	DR	There are no trans-boundary impacts of the project activity.		OK
D.1.5. Have identified environmental impacts been addressed in the project design?		/1/	DR	There no negative environmental impacts due to the project.		OK
D.1.6. Does the project comply with environmental legislation in the host country?		/1/	DR	The project complies with environmental regulations in India. The statutory clearances need to be provided to DNV for verification.	CAR-2	OK
E. Stakeholder Comments						

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<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 stakeholders, the local population and the village president have been consulted.		OK
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR/I	The stakeholders were invited for comments through village panchayat. A community consultation process was held in the premises of the village panchyat office on 15 June 2006.		OK
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR/I	A stakeholder consultation is not required by the DNA of India.		OK
E.1.4. Is a summary of the stakeholder comments received provided?	/1/	DR/I	Yes, a summary of the comments received have been provided.		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

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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: Written Host Country Approval letter must be provided for verification.	A.2.1, A.4.1	The Host Country Approval has been obtained and a copy is provided.	Accepted. The Host Country Approval letter dated 4 June 2007 has been verified. CAR 1 is closed.
CAR 2: Copy of approval from Electrical Inspectorate, Copy of clearance from the Department of Forests, Ecology and Environment need to be submitted to DNV for verification. Other statutory clearances need to be provided for verification.	D.1.1, D.1.6	The following statutory clearances have been provided to the DOE at the time of Validation of the project activity. 1. Forest approval, 2. Land Approval, 3. Approval from Electrical Inspectorate. Clearance from State pollution Control Board is not applicable to this class of activity as per the MOEF notification dated 24 September 2006.	Accepted. The documents on land lease agreement, land approval have been verified and accepted. CAR 2 is closed.
CAR 3: The baseline values differ compared to the CEA baseline emission factors. Check on the CEA website for the baseline emission factors and data thereby considered.	B.2.4, B.5.1	The PDD has been updated with Baseline emission values as per CEA notification dated 21.December.2006 (Revised)	Accepted. The CEA CO ₂ database is an official and publicly available data. The usage of CEA EF is more conservative. The revised

VALIDATION REPORT

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
			PDD has used CEA data, which is acceptable. CAR 3 is closed.
<p>CAR 4:</p> <p>While proving additionality, the anomaly of calling the method chosen as “Investment analysis” and then applying “Benchmark analysis” in the PDD is to be resolved. If investment analysis is to be adopted, it has to be done for the alternatives and prove that project IRR is not attractive.</p> <p>Alternatively, data on IRR for other alternatives from reliable sources may be used for comparison. And the source of data cited. In order to establish the benchmark of 16%, copy of RERC Order dated 29 Sep 2006 referred in the PDD needs to be submitted. Detailed financial spreadsheet analysis need to be provided for verification.</p>	B.3.3	<p>Step 2 has been used to prove the additionality of the project and Equity IRR of the project activity has been compared with the benchmark post tax equity IRR. The post tax equity IRR level benchmark has been set based on the various regulatory orders for alternative projects (hydro, thermal power projects).</p> <p>We are not aware of any studies that provide equity IRR information for alternatives (hydro, thermal projects) as these numbers are confidential. We therefore believe that the 16% equity IRR benchmark based on regulatory orders is a more transparent, publicly available and commonly accepted benchmark that can be applied for the project activity. This is the preferred approach rather than estimating separate equity IRRs for alternative projects based on general assumptions relating to capital costs, financing, taxation, etc. which can vary substantially from project to</p>	<p>Accepted.</p> <p>The revised PDD consists of the bench mark analysis. The revised financial spread sheet have been verified and deemed reasonable.</p> <p>The KEREC order on IRR bench mark has been checked and found to be appropriate.</p> <p>CAR 4 is closed.</p>

VALIDATION REPORT

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.</p> <p>We will revise the method Option II “Investment Analysis” and call it Option III “Benchmark Analysis”. However, we would rely on the same data sources (regulatory orders) and similar arguments for the 16% equity IRR and will not develop separate benchmarks using Capital Asset Pricing Model approach.</p> <p>The RERC order dated 29 Sep 2006 is available from the RERC website and the relevant extract from the RERC order stating the various regulatory orders is enclosed.</p> <p>The revised (Baseline as per CEA Notification) spreadsheet showing the financial analysis of the Project has with and without CDM Benefits is enclosed.</p>	
<p>CAR 5:</p> <p>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</p>	<p>B.8.2, B.10.9</p>	<p>The data (electricity supplied to the grid) will be archived on electronic media as well as on paper. The archive will be kept for the period up to two years after the completion of the crediting period or the last issuance of CERs for the project activity</p>	<p>Accepted.</p> <p>The data storage medium and archiving period is reasonable.</p>

VALIDATION REPORT

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
specified.		whichever occurs later. This has been included in the monitoring section B.7.1 (comments) of the PDD.	CAR 5 is closed.
CAR 6: The start date of the crediting period needs to be changed to a date after the date of registration.	C.1.2	The start date of crediting period would be from 15 October 2007.	Accepted. The date of crediting is later to the date of registration and is therefore accepted. CAR 6 is closed.
CL1: Copy of the CER purchase agreement needs to be provided for verification.	B.3.1, B.3.4	CER purchase agreement is confidential. For the CER rate, a value of US\$10 per tCO ₂ e has been used which is a representative CER price for forward transactions.	Accepted. The ERPA agreement with respect to the date of agreement has been checked. CL 1 is closed.
CL2: Is Enercon GmbH a project participant? [Refer page2, Section A.2, "The project is owned by Enercon (India) Ltd and Enercon GmbH"].	A.2.1	No, Enercon GmbH is not a project participant. Enercon GmbH has 56 % stake in Enercon India Ltd.	Accepted. CL 2 is closed.
CL3:	D.1.1		Accepted.

VALIDATION REPORT

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>EMP and monitoring of select environmental parameters mentioned in the EIA needs to be referenced under D.2 in the PDD. Details in page 94 of the EIA (Section 4.6) are not relevant to the current project. Please clarify.</p>		<p>The environmental impacts have not been considered significant for the project activity. Further, as stated earlier, there is no requirement for Enercon to conduct EIA or to obtain environmental clearance for the project.</p> <p>Enercon does not see any requirement of the EMP and the monitoring of environmental parameters provided as part of the PDD and monitored as part of the CDM project activity because there is no provision or requirement for doing this.</p> <p>Section 4.6 of the EIA narrates the procedure followed in acquiring land, the steps involved which ensures that similar quantum of land for afforestation is provided by the company to maintain the ecological balance. Further it is also ensured by the company that there are no cases of evacuation of people from the project site.</p>	<p>This is accepted as per the EIA notification; the project doesn't require an EIA. CL 3 is closed.</p>
<p>CL4: Provide the Unique Identification numbers assigned to the 38 turbines relative the project</p>	A.1.1	<p>As the installation of the activity is currently ongoing. These will be provided to the DOE at the time of first verification unless these are received prior to the issue of final validation report.</p>	<p>Accepted. CL 4 is closed.</p>

VALIDATION REPORT

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																									
activity.																												
CL5: Provide village-wise details of turbines to enable correlation between the PDD, PPA and other documents.	A.1.1	<div>The detail of the turbines as per the forest land approval is enclosed. The wind turbines are to be installed as per this plan.</div> <table><tr><th>Sl.No</th><th>District</th><th>Taluka</th><th>Village</th><th>No. Of WEC</th></tr><tr><td>1</td><td>Gadag</td><td>Mundargi</td><td>Korlahalli</td><td>6</td></tr><tr><td></td><td></td><td></td><td>Singtalur</td><td>12</td></tr><tr><td></td><td></td><td></td><td>Hammagi</td><td>20</td></tr><tr><td colspan="4">Total</td><td>38</td></tr></table>	Sl.No	District	Taluka	Village	No. Of WEC	1	Gadag	Mundargi	Korlahalli	6				Singtalur	12				Hammagi	20	Total				38	Accepted. CL 5 is closed.
Sl.No	District	Taluka	Village	No. Of WEC																								
1	Gadag	Mundargi	Korlahalli	6																								
			Singtalur	12																								
			Hammagi	20																								
Total				38																								

APPENDIX B

CERTIFICATES OF COMPETENCE



CERTIFICATE OF COMPETENCE

Michael Lehmann

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1)

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	Yes	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 4 & 5		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0027	Yes
ACM002, AMS-IA-D, AM0019, AM0026, AM0029, AM0045	Yes	AM0028, AM0034	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	AM0030	Yes
ACM0004	Yes	AM0031	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	AM0032	Yes
ACM0007	Yes	AM0035	Yes
ACM0008	Yes	AM0038	Yes
ACM0009, AM0008, AMS-III.B	Yes	AM0041	Yes
AM0006, AM0016, AMS-III.D, ACM0010	Yes	AM0034	Yes
AM0009, AM0037	Yes	AM0043	
AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I	Yes	AM0046	
AM0014	Yes	AM0047	
AM0017	Yes	AMS-II.A-F, AM0044	Yes
AM0018	Yes	AMS-III.A	Yes
AM0020	Yes	AMS-III.E, AMS-III.F	Yes
AM0021	Yes		
AM0023	Yes		
AM0024	Yes		

Høvik, 5 February 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Kumaraswamy Chandrashekara

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1)

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	Yes	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 4 & 5		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0021	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029	Yes	AM0023	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	AM0024	Yes
ACM0004	Yes	AM0027	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	AM0028, AM0034	Yes
ACM0007	Yes	AM0030	Yes
ACM0008	Yes	AM0031	Yes
ACM0009, AM0008, AMS-III.B	Yes	AM0032	Yes
AM0006, AM0016, AMS-III.D	Yes	AM0035	Yes
AM0009, AM0037	Yes	AM0038	Yes
AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I	Yes	AM0041	Yes
AM0014	Yes	AM0034	Yes
AM0017	Yes	AMS-II.A-F	Yes
AM0018	Yes	AMS-III.A	Yes
AM0020	Yes	AMS-III.E, AMS-III.F	Yes

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Ma-Paa-Puratchikkanal

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

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

Høvik, 1 March 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director