



VALIDATION REPORT

“VAAYU INDIA WIND POWER PROJECT IN JAISALMER, RAJASTHAN” IN INDIA

REPORT No. 2010-0468

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VALIDATION REPORT

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Recommended for approval by: K. V. Raman		Approved by: Michael Lehmann	Organisational unit: DNV Climate Change and Environmental Services
Client: Vaayu (India) Power Corporation Private Limited (VIPCPL)		Client ref.: Mr. Yogesh Mehra	

Summary:

Project Name: Vaayu India Wind Power Project in Jaisalmer, Rajasthan
Country: India
Methodology: ACM0002 **Version:** 12.1.0
GHG reducing Measure/Technology: Grid connected electricity generation from renewable energy source (wind)
Technical area: TA 1.2 Energy generation from renewable energy sources **Sectoral Scope:** 1

ER estimate: 87 159 tCO₂e per year (average) over a fixed 10 year crediting period

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 project activity "Vaayu India Wind Power Project in Jaisalmer, Rajasthan" in India, as described in the PDD, version 03 of 26 July 2011, meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology ACM0002, version 12.1.0. Hence DNV requests the registration of the project as a CDM project activity.

Report No.: 2010-0468		Subject Group: Environment	
Report title: "Vaayu India Wind Power Project in Jaisalmer, Rajasthan" in India			
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Work verified by: Agnes Dudek			
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Abbreviations

BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CER	Certified Emission Reduction(s)
CL	Clarification request
CM	Combined Margin
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
C-WET	Centre for Wind Energy Technology
DNA	Designated National Authority
DNV	Det Norske Veritas
EIA	Environmental Impact Assessment
EIL	Enercon (India) Limited
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IDFC	Infrastructure Development Finance Company Limited
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of approval
MoEF	Ministry of Environment and Forest
NEWNE	North East West North-Eastern
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
RBI	Reserve Bank of India
RDPPC	Rajasthan Discom Power Procurement Centre
RERC	Rajasthan Electricity Regulatory Commission
RREPC	Rajasthan Renewable Energy Power Corporation
tCO ₂ e	Tonnes of CO ₂ equivalents
UNFCCC	United Nations Framework Convention on Climate Change
WEC	Wing Energy Convertor
VIPCPL	Vaayu India Power Corporation Private Limited
VVM	Validation and Verification Manual



1 EXECUTIVE SUMMARY – VALIDATION OPINION

DNV Climate Change Services AS (DNV) has performed a validation of the project activity “Vaayu India Wind Power Project in Jaisalmer, Rajasthan” in India. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism 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 Vaayu (India) Power Corporation Private Limited from host Party India. The host Party India meets all participation requirements. The DNA of India has approved the project on 18 July 2011 and authorized the project participant and also confirmed that the project assists in achieving sustainable development.

The project correctly applies the baseline and monitoring methodology ACM0002, version 12.1.0 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”.

By generating electricity from wind energy sources and exporting it to the NEWNE grid of India, the project activity displaces an equivalent amount of grid power, which is pre-dominantly 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 87 159 tCO₂e 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 plan provides for the monitoring of the project’s emission reductions. The monitoring arrangements described in the monitoring plan are feasible within the project design and it is DNV’s opinion that the project participant is able to implement the monitoring plan.

In summary, it is DNV’s opinion that the project activity “Vaayu India Wind Power Project in Jaisalmer, Rajasthan” in India, as described in the PDD, version 03 dated of 26 July 2011, meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology ACM0002, version 12.1.0. Hence, DNV requests the registration of the project as a CDM project activity.

Bangalore and Oslo, 5 September 2011

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2 INTRODUCTION

Vaayu (India) Power Corporation Private Limited has commissioned DNV Climate Change Services AS (DNV) to perform a validation of the “Vaayu India Wind Power Project in Jaisalmer, Rajasthan” in India (hereafter called “the project”). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board.

2.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC 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 12.1.0) /33/. The validation was based on the recommendations in the Validation and Verification Manual /32/.

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.



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 tables list the documentation that was reviewed during the validation.

3.1.1 Documentation provided by the project participants

- /1/ Vaayu India Power Corporation Private Limited: CDM PDD for project activity “Vaayu India Wind Power Project in Rajasthan, Jaisalmer” version 01 dated 17 February 2010, version 02 dated 16 May 2011 and final version 03 dated 26 July 2011.
- /2/ Enercon (India) Limited: Budgetary offer for supply, erection and commissioning of 63 WECs of 800 KW for the project activity, Ref: VIPCPL/2009-10/EIL-075, dated 20 November 2009.
- /3/ Enercon (India) Limited: Technical specification of E-53 model WEC of 800 kW capacity and its life expectancy.
- /4/ Vaayu India Power Corporation Private Limited: Detailed Project Report for the project activity, dated 26 November 2009
- /5/ Vaayu India Power Corporation Private Limited: Board resolution passed at the meeting of the Board of Directors of VIPCPL, dated 28 November 2009.
- /6/ Vaayu India Power Corporation Private Limited: Purchase order for 63 WECs of 800 kW placed to Enercon (India) Limited, Ref: VIPCPL/EIL/09-10/01 dated 5 December 2009.
- /7/ Vaayu India Power Corporation Private Limited: Letter authorizing EIL to manage CDM activities and transaction of CERs for the project activity, dated 8 December 2009.
- /8/ Rajasthan Renewable Energy Power Corporation: Approval for power evacuation from wind farm dated 07 March 2008.
- /9/ C-WET: Report on site validation & generation estimate of proposed (72 x 800 kW) wind farm project in Jaisalmer district in Rajasthan, Ref: CWET-WR-CF-06-2010-11, dated 20 January 2010.
- /10/ Vaayu India Power Corporation Private Limited: E-mail with intention to seek CDM status for the project activity sent to UNFCCC, dated 27 April 2010 and acknowledgement email received from UNFCCC on dated 27 April 2010.



- /11/ Vaayu India Power Corporation Private Limited: E-mail with intention to seek CDM status for the project activity sent to MoEF, dated 19 March 2010 and acknowledgement email received from MoEF dated 22 March 2010.
- /12/ Vaayu India Power Corporation Private Limited: Loan application submitted to IDFC, dated 15 March 2010.
- /13/ Infrastructure Development Finance Corporation: Loan sanction letter, dated 30 April 2010.
- /14/ Vaayu India Power Corporation Private Limited: Letter of undertaking for non usage of official development assistance, dated 7 June 2010.
- /15/ Vaayu India Power Corporation Private Limited: Letter of undertaking for no third party sale of electricity from the project activity, dated 8 June 2010.
- /16/ Vaayu India Power Corporation Private Limited: Investment analysis spreadsheet version 1 dated 17 February 2010 and revised version 02 dated 26 July 2011.
- /17/ VIPCPL: Benchmark calculation spreadsheet version 1 dated 17 February 2010 and revised version 02 dated 26 July 2011.
- /18/ Ministry of Environment and Forests (MoEF), India: As per Ministry of Environment and Forests (MoEF) notification dated 1 December 2009, wind power projects are exempted from obtaining the environmental clearance:
<http://mnre.gov.in/notification/env-notifn.pdf>
- /19/ VIPCPL: Certificate of Incorporation of Vaayu (India) Power Corporation Private Limited, dated 12 November 2009.
- /20/ RDPPC: Commissioning certificate of 47 X 800 kW WECs at Jaisalmer district, Rajasthan dated 17 May 2011.
- /21/ RDPPC: Commissioning certificate of 8 X 800 kW WECs at Jaisalmer district, Rajasthan dated 8 July 2011.
- /22/ Jaipur Vidyut Vitran Nigam Limited: Power purchase agreement signed between VIPCPL and Jaipur Vidyut Vitran Nigam Limited for sale of electricity dated 17 June 2011.
- /23/ VIPCPL: Monthly sales invoices raised to Discoms for electricity delivered to the state grid for the month of June 2011.
- /24/ VIPCPL: Undertaking submitted by project proponent to DNA of India for commitments and monitor-able action plan towards sustainable development dated 20 July 2010.
- /25/ United India Insurance Company Limited: insurance quotation received for the project activity dated 27 October 2009.
- /26/ Government of India: Union Budget for financial year 2009-2010.
<http://www.cbec.gov.in/budget0910/bhe.pdf>
- /27/ VIPCPL: Land sub lease documents for the project activity dated 14 March 2011 and 8 July 2011.
- /28/ VIPCPL: Copy of local stakeholder invitation published in the newspaper dated 19 February 2010 and 24 February 2010.
- /29/ VIPCPL: Minutes of meeting, list of attendees with their signature and photographs of local stakeholder meeting conducted for project activity held at Jaisalmer dated 10 March 2010.
- /30/ VIPCPL: Invitation letter sent to local stakeholders to comment on the CDM project



activity dated 23 February 2010.

3.1.2 Letters of approval

- /31/ Ministry of Environment and Forest (DNA of India): letter of approval dated 18 July 2011.

3.1.3 Methodologies, tools and other guidance by the CDM Executive Board

- /32/ CDM Executive Board: Validation and Verification Manual, version 1.2
- /33/ CDM Executive Board: ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, version 12.1.0.
- /34/ CDM Executive Board: Tool for the demonstration and assessment of additionality, version 05.2
- /35/ CDM Executive Board: Tool to calculate the emission factor for an electricity system, version 02
- /36/ CDM Executive Board: Guidelines for the reporting and validation of plant load factors version 01.
- /37/ CDM Executive Board: Guidelines on assessment of investment analysis version 05
- /38/ CDM Executive Board: Guidelines on the demonstration and assessment of prior consideration of the CDM version 04.
- /39/ CDM Executive Board: Glossary of CDM terms Version 05.
- /40/ CDM Executive Board: Guidelines for completing the project design document (CDM-PDD) and the proposed new baseline and monitoring methodologies (CDM-NM), version 7 dated 2 August 2008.

3.1.4 Documentation used by DNV to validate / cross-check the information provided by the project participants

- /41/ CEA: CO₂ Baseline Database for the Indian Power Sector. Version 5, dated November 2009.
http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm
- /42/ RERC: determination of tariff for sale of electricity from wind power plants in the State to Distribution Licensees dated 16 July 2009:
http://www.rerc.gov.in/Tenders_for_Works.pdf
- /43/ Ministry of Environment and Forest: 2004: India’s national communication to UNFCCC.
http://www.natcomindia.org/publication_govt.htm
- /44/ 2006 IPCC Guidelines for National Greenhouse Gas Inventories.
- /45/ Financial Management: Theory and Practice book written by Professor Prasanna Chandra (Director, Centre for Financial Management and ex professor of finance at IIM- Bangalore).



- /46/ Risk free rate proposed by Reserve Bank of India for the month of November 2009.
http://rbidocs.rbi.org.in/rdocs/Bulletin/PDFs/27CT_BUNOV09.pdf
- /47/ Historical Risk free rate form the Reserve Bank of India
http://rbidocs.rbi.org.in/rdocs/Publications/PDFs/119T_HBSE200910.pdf
- /48/ BSE-200 data from 1 April 1989 to 30 October 2009 available at www.bseindia.com
- /49/ CRISIL Advisory Services: Report on Cost of Capital calculation method for Central Sector Utilities dated 13 April 2000.
- /50/ Ministry of new and renewable energy sources: Accelerated depreciation policy for wind power projects in India:
http://www.windpowerindia.com/index.php?option=com_content&view=article&id=10&Itemid=15
- /51/ Ministry of new and renewable energy sources: Generation Based Incentives for wind power projects in India:
http://www.cwet.tn.nic.in/Docu/Grid_Interactive_Wind_Power_Projects.pdf
- /52/ Government of India: Union Budget for financial year 2009-2010.
<http://www.cbec.gov.in/budget0910/bhe.pdf>
- /53/ Income Tax Act 1961, sourced from Income Tax Department, Ministry of Finance.
<http://law.incometaxindia.gov.in/DIT/Income-tax-acts.aspx>
- /54/ Wind Power Directory 2009: detailed list of wind power projects commissioned in all states of India.

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:

- Inclusion of geo-coordinates of the WECs pertaining to the project activity (CAR 2).
- Inclusion of formal QA/QC procedures and role of project proponent in overall monitoring of the project activity (CAR 3).
- Revision in applied version of the methodology from ACM0002 version 11 to ACM002 version 12.1.0 (CAR 5).
- Change in start date of crediting period from 1 April 2011 to 1 October 2011 in line with the revised timelines of validation (CAR 6).
- Revision in sensitivity analysis in line with the requirement of Tool for the demonstration and assessment of additionality, version 05.2 (CL 3).
- Inclusion of generation based incentive in post-tax equity IRR calculation (CL 3).
- Provision for monitoring the net electricity generation in order to calculate baseline emission has been formalized (CL 4).
- Detailed chronology for CDM consideration in line with the requirement of Guidelines on the demonstration and assessment of prior consideration of the CDM version 03 (CL 5).



3.2 Follow-up interviews with project stakeholders

On 10 June 2010, DNV performed interviews with project participant (VIPCPL) and project consultant (PwC) to confirm the stated information and to resolve issues identified in the document review. At the time of interview, the project was in the preliminary stage of development and the installation of machines was yet to be installed at site. Hence, the interview was carried out in project proponent's office. The main topics of the interviews are summarized in the table below.

	Date	Name	Organization	Topic
/55/	2010-06-10	Mr. Puneet Katyal, Head, CDM	Enercon (India) Limited, Mumbai	➤ Proof of CDM consideration
		Mr. Himanshu Bhatnagar, Asst. Manager, CDM Corporate		➤ Applicability of methodology
		Mr. Rohit Joshi, CDM Corporate		➤ Review of project design and technology used.
		Mr. Saujanya Kumar, CDM Corporate		➤ Review of monitoring and verification procedure, management structure of the organization.
		Ms. Anushree Mishra, CDM Corporate		➤ Environmental consents and permits.
		Mr. Neeraj Gupta	Price Waterhouse Coopers, Gurgaon	➤ Review of the stakeholder consultation process.
				➤ Joint meter reading procedures.
				➤ Operation & maintenance procedures.
				➤ Determination of baseline
				➤ Third party assessment of PLF
				➤ Assessment of project additionality, benchmark determination, financial analysis.
				➤ Emission reduction calculations and data used.
				➤ Determination of baseline.



3.3 Resolution of outstanding issues

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

- 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 four tables. The different columns in these tables are described in the figure below. The completed validation protocol for the project activity "Vaayu India Wind Power Project in Jaisalmer, Rajasthan" in India is enclosed in Appendix A to this report.

A corrective action request (CAR) is raised if one of the following occurs:

- (a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
- (b) The CDM requirements have not been met;
- (c) There is a risk that emission reductions cannot be monitored or calculated.

A clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

A forward action request (FAR) is raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the CDM requirements for registration.

**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) or a corrective action request (CAR) if a requirement is not met.</i>

Validation Protocol Table 2: Requirement Checklist

Checklist question	Reference	Means of verification (MoV)	Assessment by DNV	Draft and/or Final Conclusion
<i>The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the CDM-PDD</i>	<i>Gives reference to documents where the answer to the checklist question or item is found.</i>	<i>Means of verification (MoV) are document review (DR), interview (I) or any other follow-up actions (e.g., on site visit and telephone or email interviews) and cross-checking (CC) with available information relating to projects or technologies similar to the proposed CDM project activity under validation.</i>	<i>The discussion on how the conclusion is arrived at and the conclusion on the compliance with the checklist question so far.</i>	<i>OK is used if the information and evidence provided is adequate to demonstrate compliance with CDM requirements. A corrective action request (CAR) is raised when project participants have made mistakes, the CDM requirements have not been met or there is a risk that emission reductions cannot be monitored or calculated. A clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met. A forward action request (FAR) during validation is raised to highlight issues related to project implementation that require review during the first verification of the project activity.</i>

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests

Corrective action and/or clarification requests	Ref. to checklist question in table 2	Response by project participants	Validation conclusion
<i>The CARs and/or CLs raised in Table 2 are repeated here.</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 to address the CARs and/or CLs.</i>	<i>The validation team's assessment and final conclusions of the CARs and/or CLs.</i>

Validation Protocol Table 4: Forward Action Requests

Forward action request	Ref. to checklist question in table 2	Response by project participants
<i>The FARs raised in Table 2 are repeated here.</i>	<i>Reference to the checklist question number in Table 2 where the FAR is explained.</i>	<i>Response by project participants on how forward action request will be addressed prior to first verification.</i>

Figure 1: Validation protocol tables



3.4 Internal quality control

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

3.5 Validation team

<i>Role</i>	<i>Last Name</i>	<i>First Name</i>	<i>Country</i>	<i>Type of involvement</i>						
				Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	TA 1.2 competence	Financial expertise
Team leader (Validator)	Govindarajulu	Murali	India	✓		✓	✓		✓	
Validator	Srivastava	Gaurav	India	✓		✓			✓	
Validator with financial expertise	Kapoor	Nitin	India	✓						✓
Assessor under training	Parthasarathy	Kannan	India	✓					✓	
Validator	Prabhu	Ravi Kumar	India	✓	✓				✓	
Technical reviewer	Dudek	Agnes	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 PDD, version 03 dated of 26 July 2011 /1/.

4.1 Participation requirements

The project is developed by Vaayu (India) Power Corporation Private Limited, a special vehicle incorporated by Enercon (India) Limited to set up wind power project in various states of India as verified by DNV from the Certificate of Incorporation dated 12 November 2009 /19/. The project is proposed as a unilateral project and no project proponent from Annex I Party has yet been identified. The host Party India meets all the requirements for participating in a CDM project. The Ministry of Environment and Forests, the DNA of India, has approved the project with a letter of approval dated 18 July 2011, which also confirms that the project assists in achieving sustainable development in India /31/. The letter of approval was received from the project participants. DNV does not doubt the authenticity of the letter of approval. DNV considers the letter is in accordance with paragraphs 45- 48 of the VVM /32/.

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 /14/.

4.2 Project design

The project activity envisages implementation of a 50.4 MW wind power project consisting of 63 WECs of individual capacity 0.8 MW at Sipla, Pithla, Senag, Barna, Khuhri and Kotri villages in Jaisalmer district of Rajasthan state in India. Out of 63 wind energy convertors (WECs), 55 WECs have been already commissioned /20/ /21/ and the remaining 8 WECs are expected to be commissioned by 31 July 2011. All the WECs in the project have been supplied by Enercon (India) Ltd /6/, which is also responsible for the operation, maintenance and management of the project. The technology used in the project activity is indigenously available in India and no transfer of technology is envisaged.

The geographical coordinates of project extends between latitude N 26°40'25.4" to latitude N 26°44'48.7" and longitude E 70°42'13.8" to longitude E 70°49'23.5".

The electricity generated from the wind farm will be exported to the regional electricity grid and sold to the state electricity utility thereby marginally contributing to reducing the energy demand supply gap in the state of Rajasthan. Proposed project is expected to export 94.482 GWh per year at a plant load factor of 21.40% /9/. The applied plant load factor has been verified by DNV against independent third party generation estimation report prepared by Centre for Wind Energy Technology (an autonomous research and development institution under Ministry of New and Renewable Energy) dated 20 January 2010 /9/. DNV could confirm that the PLF assumed by project proponent is reasonable and is in line with the requirement of CDM EB guidelines for the reporting and validation of plant load factors /36/.

The starting date of the project activity has been identified as 5 December 2009, which is the date of purchase order placed to Enercon (India) Limited for the wind turbines of the project



activity /6/. As per the technical specification sheet provided by Enercon (India) Limited (manufacturer of WECs) the lifetime of the project is 20 years /3/, which is reasonable for a WEC and has been cross checked by DNV against RERC tariff order dated 16 July 2009 /42/.

The project has selected a fixed crediting period of 10 years with the start date of the crediting period to be 1 October 2011 (or on the date of registration of the CDM project activity, whichever is later). The project is expected to result in 87 159 tCO₂e emission reductions per annum over the crediting period /1/.

DNV considers the project description of the project contained in the PDD to be complete and accurate. The PDD complies with the relevant forms and guidance for completing the PDD /40/.

4.3 Application of selected baseline and monitoring methodology

The project correctly applies the approved baseline methodology ACM0002, version 12.1.0 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”/33/. The applicability of this methodology is justified as:

- The project is a new installation of wind electricity convertors which harnesses the wind potential available in the region and it displaces fossil fuel based electricity from the north east west north-eastern grid of India and has been verified from (i) purchase order placed for the project activity dated 5 December 2009 /6/, (ii) commissioning certificate issued by RDPPC dated 17 May 2011 for 37.6 MW /20/, dated 8 July 2011 for 6.4 MW /21/ and (iii) power purchase agreements signed for the project activity dated 17 June 2011 /22/. The commissioning certificates are verified in line with the unique identification numbers and commissioning dates of each WEC as included in Appendix 2 of PDD /1/.
- The project activity is connected to the north east west north-eastern grid of India, and the system boundaries are clearly identified and information on the characteristics of this grid is available /41/
- The project does not involve an on-site switch from fossil fuels to a renewable source.

The project activity being a renewable energy generation project, the rest of the applicability conditions as mentioned in the applied methodology ACM0002 version 12.1.0 /33/ do not apply to this project activity.

The assessment of the project’s compliance with the applicability criteria of ACM0002 (version 12.1.0) /33/ are documented in detail in section B.2 of Table 2 in the validation protocol in Appendix A to this report.

4.4 Project boundary

The geographic and system boundary includes the wind electricity convertors installed as part of the project activity and the north east west north-eastern grid of India. The system boundary for the relevant electricity grid can be clearly identified and information on the characteristics of the grid is available /41/.

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 north east west and north-eastern regional grid of India.
Project emissions	No project emissions	NA
Leakage	No leakage	NA

The identified boundary and selected sources and gases are justified for the project activity. The validation of the project activity did not reveal any other greenhouse gas emissions occurring within the proposed CDM project activity boundary as a result of the implementation of the proposed project activity which are expected to contribute more than 1% of the overall expected average annual emission reduction, which are not addressed by ACM0002 (version 12.1.0) /33/.

4.5 Baseline identification

Baseline Scenario: Two alternatives to the project activity have been considered in arriving at the baseline scenario. These are i) the 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 (in section B.4.4), the implementation of the 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.

It is DNV's opinion that the list of alternatives considered to be realistic, credible and complete and the determination of the baseline is transparent.

As the project activity supplies electricity to the Rajasthan state electricity grid which forms a part of north east west and north-eastern regional grid of India, the baseline for this project activity is a function of the generation mix of the north east west and north-eastern regional grid of India. The selection of the north east west and north-eastern regional grid of India as the grid system boundary for the project activity is in line with the EB guidance for large countries such as India. In line with the guidance provided in the "Tool to calculate the emission factor for an electricity system"/35/, the weights for OM and BM have been taken as 75:25. The combined margin emission coefficient for the north east west and north-eastern regional grid of India has been calculated at 0.92252 tCO₂e/MWh and is fixed *ex ante* for the entire fixed crediting period /41/. The CM emission factor value has been sourced from data by the Central Electricity Authority (CEA) of the Ministry of Power, Government of India /41/. CEA has published a database of carbon dioxide emission factors for the power sector in India based on detailed authentic information obtained from all operating power stations in the country. 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 /41/. The emission factors for coal and lignite were based on the values provided in India's Initial National Communication under the UNFCCC (Ministry of Environment & Forests, 2004) /43/. The emission factor for coal is supported by the results of an analysis of approximately 120 coal samples collected from different Indian coal fields. For all other fuels, default emission factors were derived from the IPCC 2006 Guidelines /44/. The OM sourced from 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 2006-07, 2007-08 and 2008-09 /41/. BM is calculated *ex-ante* based on the 20% most recent capacity additions in the north east west and north-eastern regional grid of India based on net generation for the year 2008-09 /41/. The operating margin has been determined to be 1.00498 tCO_{2e}/MWh and the build margin to be 0.6752 tCO_{2e}/MWh /41/. DNV confirms that the database version 5 used to calculate the combined margin emission factor was the latest database available at the time of start of validation and the combined margin emission factor for the north east west and north-eastern regional grid of India is fixed *ex-ante* for the entire crediting period.

DNV confirms that the approved baseline methodology ACM0002 (version 12.1.0) has been correctly applied to identify a complete list of realistic and credible baseline scenarios, and the identified baseline scenario most reasonably represents what would occur in the absence of the proposed CDM project activity. All the assumption and data used by the project participants are listed in the PDD and/or supporting documents. All documentation relevant for establishing the baseline scenario and are correctly quoted and interpreted in the PDD /1/. Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable. Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD /1/.

4.6 Additionality

The additionality of the project activity is demonstrated by applying the "Tool for demonstration and assessment of additionality", version 5.2 /34/ and primarily through a financial analysis.

4.6.1 Evidence for prior CDM consideration and continuous actions to secure CDM status

The starting date of the project activity has been identified as 5 December 2009, which is the date of purchase order placed to Enercon (India) Limited for the wind turbines of the project activity /6/. In India wind farms are operated and maintained by the WEG supplier and any civil work or transmission network can only be started after the placement of purchase order project for the wind turbines. Hence DNV confirms that the selected date was the earliest date of investment and in line with the EB guidance on start date of project activity /39/.

Since the start date of the project activity is after 2 August 2008, the project proponent has notified their intentions to apply for CDM for the project activity to the DNA of India on 19 March 2010 /11/ and UNFCCC secretariat through an email communication on 27 April 2010 /10/. On 22 March 2010 project proponent had received the acknowledgement email from DNA of India /11/ and on 27 April 2010 the acknowledgement from UNFCCC secretariat /10/. DNV has also evidenced the CDM consideration from the Vaayu India Power Corporation Private Limited board approval dated 28 November 2009 for the project activity /5/, which is before the starting date of the project activity which clearly states that "Board



members opined that the project would not be financially viable on a stand alone basis only through sale of electricity. The director informed the board the financial risk posed to the project could be mitigated through the Clean Development Mechanism of UNFCCC, which provides additional revenue stream to clean energy projects through the sale of certified emission reductions and the project could still be viable investment if the benefits of CDM can be secured. The board concluded that steps should be taken at the earliest to ensure CDM registration of project". CDM was therefore found to be seriously considered in the decision to proceed with the project activity.

The PDD was web hosted on UNFCCC site for global stakeholder commenting process on 23 April 2010, which is within six months from the start date of project activity. Thus it has been confirmed that sufficient actions to secure CDM status were taken.

It is DNV's opinion that the proposed CDM project activity complies with the requirements of the latest version of the guidance on prior consideration of CDM /38/.

4.6.2 Identification of alternatives to the project activity

Two alternatives to the project activity have been considered in arriving at baseline scenario. These are i) the 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.

4.6.3 Investment analysis

Choice of approach

The project proponent has selected a benchmark analysis for demonstrating the additionality of the project activity. 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 justified for demonstrating the additionality of the project. The financial indicator applied for the project activity is post tax equity IRR and is compared against the expected post-tax return on the equity (calculated based on the Capital Asset Pricing Mechanism Model).

Benchmark selection

The benchmark selected for the project activity is as per the CDM EB guidance on assessment of investment analysis /37/. The project activity is electricity generation based on wind energy which could be developed by an entity other than project participant. The benchmark should thus be based on publicly available data sources. The benchmark used for the project activity is required rate of return on equity for the project calculated using the Capital Asset Pricing Model (CAPM). As per CAPM, the required return on equity investment is the return of a risk-free security plus beta times the difference between the market return and the risk-free return. The Government Securities have been taken to represent the risk free return. Stock index has been used to represent the market return. Power Industry specific beta value is applied to represent the market returns relevant to the risk of the project activity sector. The suitability of the benchmark and the appropriateness of the calculations adopted has been verified and accepted based on Financial Management: *Theory and Practice* book written by Professor Prasanna Chandra (Director, Centre for Financial Management and ex professor of finance at IIM- Bangalore) /45/. The key parameters of the CAPM model have been calculated as follows:



- An average government bond rate (risk free rate) applicable at the time of investment decision (in November 2009) for long term investment (for 20 years) has been considered. The project participant has sourced this value ($R_f = 7.98\%$ for the period from June 2009 to September 2009) from the monthly bulletin on government securities market published by Reserve Bank of India. Reserve Bank of India is the central controlling bank and its database is an official source of information in India /46/. DNV accepted this value as it has been sourced directly from the RBI report and was latest at the time of investment decision. DNV has further cross checked historical value for average risk free rates in India for the 5 years preceding the project investment decision /47/ confirming that the chosen value is reasonable.
- Market return ($R_m = 15.55\%$) or Compound Accumulated Growth Rate (CAGR): In India the market return can be calculated from the following available indices: (i) BSE-Sensex, (ii) BSE-200 (iii) BSE-500 and (iv) BSE 100. Hence the project proponent has calculated the market return from all these indices from the start date of the indices till date of investment and the minimum market return indices has been used for the market return calculation /48/. The minimum market return was offered by BSE 200 (15.5%) /48/ and hence conservatively same has been applied for the benchmark calculation.
- The time period of five year considered for equity beta value calculation is justified as per Credit Rating Information Services of India limited (CRISIL) recommendations to CERC /49/ and it was recommended by financial experts in the report that, for such economies, and for companies whose capital structure and operating environment has been changing, the time period over which equity beta is calculated should be small, as in case of power sector in India which went significant restructuring after electricity act 2003. This ensures that the risk profile of the company vis-à-vis the market is relatively stable over the term over which equity beta is being calculated.
- The average raw equity beta value of 1.17 (coefficient reflecting the volatility of the stock relative to the market) is calculated over the period of five year (31 October 2004 to 25 October 2009) using BSE index of the market portfolio for the companies in the power sector that were listed at the time of decision making: Tata Power (1.029), CESC limited (1.105), Reliance Energy (1.569), Gujarat Industries (0.961) and Energy Development (1.187). These values were sourced from Bloomberg web site and screenshots of the same are provided in Appendix 3 of PDD /1/.
- Though the principles of corporate finance require that equity Beta need to be adjusted to reflect the change in financing mix between the project and the listed power companies, since the debt equity ratios of the power company's listed at the stock exchanges were lower than that of the project activity, any adjustment on account of change in debt equity ratio will result in a higher equity beta value (2.13) which in turn will result in higher benchmark (24.11%) /17/, DNV has accepted the use of average raw equity beta value instead of adjusted equity beta values.

Based on Capital Asset Pricing Model expected cost of equity works out to be 16.84% /17/. The expected cost of equity calculation has been verified by DNV and was found to be correct. DNV also confirms the same benchmark was used by project proponent for other two registered CDM projects (UNFCCC Ref No: 4700 and 4677), for which also the investment decision was taken at same time.



Input parameters

The input parameters used in the financial analysis of the project activity have been sourced from the detailed project report prepared by project proponent dated 26 November 2009 /4/. The input parameters used in detailed project report were either sourced from budgetary offer received from Enercon (India) Limited dated 20 November 2009 /2/ or Rajasthan electricity regulatory commission order on “determination of tariff for sale of electricity from wind power plants in the state to distribution licensees” dated 16 July 2009 /42/, applicable at the time of investment decision taken for the project activity. DNV confirms that the input values used in the financial analysis are consistent with the evidence reviewed. Given that the time gap between the starting date of the project activity and preparation of DPR is less than a month, it is reasonable to assume that the DPR was the basis of the decision to proceed with the investment in the project activity. All the input parameters used for investment analysis except plant load factor, which is sourced from independent third party electricity generation estimation report, prepared by Centre for Wind Energy Technology (an autonomous research and development institution under Ministry of New and Renewable Energy) dated 20 January 2010 /9/, have been sourced from detailed project report of 26 November 2009 /4/.

DNV has accepted the application of plant load factor of 21.40% as provided in independent third party generation estimation report, prepared by Centre for Wind Energy Technology (an autonomous research and development institution under Ministry of New and Renewable Energy) as:

a) Application of this value for investment analysis is more conservative than values provided in budgetary offer received from Enercon (India) Limited dated 20 November 2009 /2/ (available at the time of investment decision).

b) This is based on the generation estimate provided by independent third party Centre for Wind Energy Technology (an autonomous research and development institution under Ministry of New and Renewable Energy), in line with Para 3 (b) of UNFCCC guidelines for the reporting and validation of plant load factors version 01 /36/.

In line with the requirement of VVM Para 111, DNV has a detailed assessment of input parameters used for input parameters are provided below:

Input parameter	Values used for investment Analysis	Source for DPR Value	Reference used by DNV for cross checking
Technical Parameters			
Capacity of machine in kW	800 kW	Budgetary offer received from Enercon (India) Limited dated 20 November 2009 /2/.	The capacity of individual machine has been verified against the purchase order placed to Enercon (India) Limited for the project activity dated 5 December 2009 /6/ and commissioning certificates of the WECs /20//21/.
Number of Machines (WECs)	63	Budgetary offer received from Enercon (India) Limited dated 20 November 2009	The capacity of individual machine has been verified against the purchase order placed to Enercon (India) Limited for the project activity dated



		/2/.	5 December 2009 /6/.
Capacity of the project in MW	50.4 MW	Calculated as a product of number of machines and capacity of individual machine (WEC).	Calculated as a product of number of machines and capacity of individual machine (WEC).
Operational Parameters:			
Plant Load Factor	21.40%	The plant load factor provided in the detailed project report is 21.12%, which was based on the electricity generation guarantee provided in budgetary offer received from Enercon (India) Limited dated 20 November 2009 /2/.	<p>The plant load factor provided in the detailed project report is 21.12%, which was based on the electricity generation guarantee provided in budgetary offer received from Enercon (India) Limited dated 20 November 2009 /2/.</p> <p>However the investment analysis is conducted based on the plant load factor of 21.40% as provided in independent third party electricity generation estimation report, prepared by Centre for Wind Energy Technology (an autonomous research and development institution under Ministry of New and Renewable Energy) dated 20 January 2010 /9/. This is in line with Para 3 (b) of UNFCCC guidelines for the reporting and validation of plant load factors version 01 “plant load factor determined by a third party (engineering company) contracted by the project participants”/36/.</p> <p>DNV has accepted the application of gross plant load factor of 21.40% as provided in independent third party (generation estimate) report as:</p> <p>a) Application of this value for investment analysis is more conservative as the electricity generation guarantee provided in the supply offer /2/ is only 21.12% /2/.</p> <p>b) This is based on the PLF (generation estimate) provided by</p>



			<p>independent third party /9/.</p> <p>DNV has cross checked that the PLF value used in investment analysis sheet is consistent with the value provided by the independent third party report /9/.</p>
Insurance charges (% of project cost)	0.12%	<p>The insurance cost considered is detailed project report was considered based on the insurance quotation received from United India Insurance Company Limited dated 27 October 2009 /25/.</p>	<p>The RERC tariff order does not provide separate value for insurance charges. RERC tariff order considers insurance charges as a part of O & M cost and provides 1.25% of the total project cost as O & M cost /42/.</p> <p>DNV has cross checked that even after considering insurance charges as zero, the equity IRR for the project activity (8.08%) remains below that the benchmark applied for the project /16/.</p>
O & M cost (% of project cost)	1.30%	<p>The O & M cost considered in the detailed project report was based on the budgetary offer received from Enercon (India) Limited (O & M contractor for the project) dated 20 November 2009 /2/.</p>	<p>RERC tariff order considers O & M cost (including insurance cost) as 1.25% of the total project cost /42/.</p> <p>DNV has cross checked that even after considering consider O & M cost as 1.25% (considering insurance cost as zero), the equity IRR for the project activity (8.22%) remains below that the benchmark applied for the project /16/.</p>
Annual escalation in O & M cost (in %)	6%	<p>The annual escalation in operation and maintenance cost considered in the detailed project report was based on the budgetary offer received from Enercon (India) Limited (O & M contractor for the project) dated 20</p>	<p>RERC tariff order recommends 5.72% annual escalation in operation and maintenance costs /42/.</p> <p>However, DNV has assessed that even after considering insurance cost as zero, O & M cost as 1.25% and annual escalation in O & M costs as 5.72% the equity IRR for the project activity (8.29%) remains below that the benchmark applied for the project /16/.</p>



		November 2009 /2/.	
Service tax on operation and maintenance cost	12.36%	As per service tax applicable for financial year 2009-2010.	DNV has cross checked that this is in line with tax rate prescribed in union budget for financial year 2009-2010 /26/.
Project Revenue			
Electricity tariff (in INR/kWh)	4.28 INR/kWh fixed for 20 years without any escalation	The electricity tariff of 4.28 INR/kWh considered in detailed project report was based on the RERC order for “determination of tariff for sale of electricity from wind power plants in the state to distribution licensees” dated 16 July 2009 /42/ and is fixed for 20 years without any escalation.	<p>The electricity tariff considered in detailed project report was based on the RERC order for “determination of tariff for sale of electricity from wind power plants in the state to distribution licensees” dated 16 July 2009 /42/ .</p> <p>DNV has cross-checked the electricity tariff applicable for the project activity against the power purchase agreements signed for the project activity /22/ and recent sales invoices raised to state electricity board /23/and found that:</p> <p>The actual electricity tariff applicable to project activity is only 4.22 INR/kWh and is fixed for 20 years without any escalation /23/.</p> <p>Hence use of electricity tariff of 4.28 INR/kWh for investment analysis is conservative.</p> <p>DNV has also verified from the recent sales invoice raised to Discoms that VAT is not applicable for sale of electricity and no tax has been included in the invoices /23/.</p>
Generation based incentive (in INR/kWh), applicable to wind power projects with cap of 6.2 Million INR/MW	0.5 INR/kWh	Incentive provided by Ministry of new and renewable energy sources for wind energy projects.	<p>Ministry of new and renewable energy sources, government of India offers two types of incentives for wind power projects /51/, project activity can claim any one out of these two:</p> <p>a) 80% accelerated depreciation under the Income Tax Act /50/.</p> <p>b) Generation based incentives (GBI) of 0.5 INR/kWh with cap of 6.2 Million INR/MW of installed capacity. This 6.2 Million INR/MW can be claimed in a period not less than 4 years and a maximum period</p>



			<p>of 10 years /51/.</p> <p>The project activity has applied for generation based incentives and it has been verified by DNV that project proponent can avail only under one scheme as project proponent have to intimate first to Ministry about the option opted and ministry have procedure in place to track that project can avail benefit under one scheme only.</p>
Project Cost for 63 Wind Energy Convertors:			
Machine cost in million INR (for 63 WECs cost)	2 072.49	Budgetary offer received from Enercon (India) Limited dated 20 November 2009 /2/.	<p>The total machine cost (for 63 WECs) considered in the detailed project report was based on the budgetary offer received from Enercon (India) Limited dated 20 November 2009 /2/, however the total machine cost was only found to be 1921.5 million INR only and has been verified by DNV from the actual purchase order placed to Enercon India limited dated 5 December 2009 /6/.</p> <p>The effect of reduction of this cost has been considered in sensitivity analysis (while cross checking the equity IRR based on the actual project cost).</p>
Concrete tower cost in million INR (for 63 WECs)	373.73	Budgetary offer received from Enercon (India) Limited dated 20 November 2009 /2/.	<p>The total concrete tower cost (for 63 WECs) considered in the detailed project report was based on the budgetary offer received from Enercon (India) Limited dated 20 November 2009 /2/, however the total concrete tower cost was found to be 346.5 million INR only and has been verified by DNV from the actual purchase order placed to Enercon India limited dated 5 December 2009/6/.</p> <p>The effect of reduction of this cost has been considered in sensitivity analysis (while cross checking the equity IRR based on the actual project cost).</p>



Distribution transformer cost in million INR (for 63 WECs)	156.29	Budgetary offer received from Enercon (India) Limited dated 20 November 2009 /2/.	<p>The total distribution transformer cost (for 63 WECs) considered in the detailed project report was based on the budgetary offer received from Enercon (India) Limited dated 20 November 2009 /2/, however the total distribution transformer cost was found to be 144.9 million INR only and has been verified by DNV from the actual purchase order placed to Enercon India limited dated 5 December 2009 /6/.</p> <p>The effect of reduction of this cost has been considered in sensitivity analysis (while cross checking the equity IRR based on the actual project cost).</p>
Civil works, foundation and electrical lines cost in million INR (for 63 WECs)	101.93	Budgetary offer received from Enercon (India) Limited dated 20 November 2009 /2/.	<p>The total civil works, foundation and electrical lines cost (for 63 WECs) considered in the detailed project report was based on the budgetary offer received from Enercon (India) Limited dated 20 November 2009 /2/, however the total civil works, foundation and electrical lines cost was found to be 94.5 million INR only and has been verified by DNV from the actual purchase order placed to Enercon India limited dated 5 December 2009 /6/.</p> <p>The effect of reduction of this cost has been considered in sensitivity analysis (while cross checking the equity IRR based on the actual project cost).</p>
Erection, commissioning, insurance and other works cost in million INR (for 63 WECs)	101.93	Budgetary offer received from Enercon (India) Limited dated 20 November 2009 /2/.	<p>The total erection, commissioning, insurance and other works cost (for 63 WECs) considered in the detailed project report was based on the budgetary offer received from Enercon (India) Limited dated 20 November 2009 /2/, however the total erection, commissioning, insurance and other works cost was found to be 94.5 million INR only and has been verified by DNV from the actual purchase order placed to Enercon</p>



			<p>India limited dated 5 December 2009 /6/.</p> <p>The effect of reduction of this cost has been considered in sensitivity analysis (while cross checking the equity IRR based on the actual project cost).</p>
Land and Transportation charges cost in million INR (for 63 WECs)	74.75	Budgetary offer received from Enercon (India) Limited dated 20 November 2009 /2/.	<p>The total land and transportation cost (for 63 WECs) considered in the detailed project report was based on the budgetary offer received from Enercon (India) Limited dated 20 November 2009 /2/, however the total land and transportation cost was found to be 69.3 million INR only and has been verified by DNV from the actual purchase order placed to Enercon India limited dated 5 December 2009 /6/.</p> <p>The effect of reduction of this cost has been considered in sensitivity analysis (while cross checking the equity IRR based on the actual project cost).</p>
Transfer of Development right charges in million INR (for 63 WECs)	108.73	Budgetary offer received from Enercon (India) Limited dated 20 November 2009 /2/.	<p>The total transfer of development right charges (for 63 WECs) considered in the detailed project report was based on the budgetary offer received from Enercon (India) Limited dated 20 November 2009 /2/, however the total Transfer of Development right charges was found to be 100.8 million INR only and has been verified by DNV from the actual purchase order placed to Enercon India limited dated 5 December 2009 /6/.</p> <p>The effect of reduction of this cost has been considered in sensitivity analysis (while cross checking the equity IRR based on the actual project cost).</p>
Total project cost in million INR (for 63 WECs)	2 989.82	Budgetary offer received from Enercon (India) Limited dated 20 November 2009	The total project cost of 2 989.82 million INR considered in DPR was calculated based on the summation of machine cost, concrete tower cost, distribution transformer cost, Civil



		/2/.	works, foundation and electrical lines cost, Erection, commissioning, insurance and other works cost, land and transportation charges cost and transfer of development right charges for 63 WECs provided in budgetary offer received from Enercon (India) Limited dated 20 November 2009 /2/. However based on the actual purchase order placed to Enercon India limited dated 5 December 2009 /6/ the total project cost was verified to be 2 772 million INR only (summation of actual machine cost, concrete tower cost, distribution transformer cost, Civil works, foundation and electrical lines cost, Erection, commissioning, insurance and other works cost, land and transportation charges cost and transfer of development right charges for 63 WECs) /6/. However, DNV has assessed that even after considering the actual project cost of 2 772 million INR, the equity IRR for the project activity (9.77%) remains below the benchmark applied for the project/16/.
Means of Finance:			
Equity in %	30%	The debt equity ratio of 70:30 considered in detailed project report was based on the debt equity ratio recommended by in its RERC order for “determination of tariff for sale of electricity from winds power plants in the state to distribution licensees” dated 16 July 2009 /42/.	DNV has cross-checked the debt equity ratio of 70:30 considered in detailed project report with actual debt equity ratio provided in the loan agreement signed with IDFC dated 30 April 2010 and the value was found to be consistent /13/.
Debt in %	70%	The debt equity ratio of 70:30 considered in detailed project report	DNV has cross-checked the debt equity ratio of 70:30 considered in detailed project report with actual



		was based on the debt equity ratio recommended by in its RERC order for “determination of tariff for sale of electricity from winds power plants in the state to distribution licensees” dated 16 July 2009 /42/.	debt equity ratio provided in the loan agreement signed with IDFC dated 30 April 2010 /13/ and the value was found to be consistent.
Terms of loan			
Interest rate	11.5%	The interest rate considered in detailed project report was based on the average prime lending rate (11%-12%) proposed by reserve bank of India (applicable at the time of investment decision) /46/.	DNV has cross checked the interest rate considered in detailed project report against the interest rate applicable to the project, provided in the loan agreement signed with IDFC dated 30 April 2010 and the actual value was found to be 11.11% /13/. However, DNV has assessed that even after considering the actual interest rate applicable to the project, the equity IRR for the project activity (8.06%) remains below that the benchmark applied for the project /16/.
Loan tenure	10	The loan tenure considered in detailed project report was based on the RERC order for “determination of tariff for sale of electricity from winds power plants in the state to distribution licensees” dated 16 July 2009 /42/.	The actual loan tenure was found to be 12 years and has been verified by DNV from the loan agreement signed with IDFC dated 30 April 2010 /13/. The effect of reduction of interest rate has been considered in sensitivity analysis. However, DNV has assessed that even after considering actual loan tenure of 12 years applicable to the project, the equity IRR for the project activity (7.71%) remains below that the benchmark applied for the project /16/.
Depreciation Rate			
Depreciation rate (based on written down value as per Income Tax Act)	15%	The Depreciation rate (based on written down value) considered in DPR was based on the Income Tax act /53/.	DNV has verified from the income tax act that the Depreciation rate (based on written down value) applied is in line with Income Tax Act 1961 of India /53/.



Book depreciation rate (as per straight line method) on all assets	4.5%	As per RERC order for “determination of tariff for sale of electricity from winds power plants in the state to distribution licensees” dated 16 July 2009 /42/, the lifetime of WEC is 20 years and depreciation can be claimed for 90% of the asset.	DNV has verified from the RERC order for “determination of tariff for sale of electricity from winds power plants in the state to distribution licensees” dated 16 July 2009 /42/, the lifetime of WEC is 20 years and depreciation can be claimed for 90% of the asset. Hence Book depreciation rate of 4.5% (as per straight line method) has been calculated considering 20 years lifetime of WEC and depreciation of 90% of the asset (except land).
Book depreciation up to (% of asset value)	90%	As per RERC order for “determination of tariff for sale of electricity from winds power plants in the state to distribution licensees” dated 16 July 2009 /42/, depreciation can be claimed for 90% of the asset (except land).	DNV has verified from the RERC order for “determination of tariff for sale of electricity from winds power plants in the state to distribution licensees” dated 16 July 2009 /42/, that depreciation can be claimed for 90% of the asset (except land).
Salvage Value	10%	A salvage of 10% has been considered in investment analysis and same has been added back in last year cash flow this is in line with the guidance provided by RERC order for “determination of tariff for sale of electricity from winds power plants in the state to distribution licensees” dated 16 July 2009 /42/.	A salvage of 10% has been considered in investment analysis and same has been added back in last year cash flow this is in line with the guidance provided by RERC order for “determination of tariff for sale of electricity from winds power plants in the state to distribution licensees” dated 16 July 2009 /42/.
Income Tax Rates:			
Corporate Tax	33.99%	As per Indian Income Tax Act 1961 /53/.	As per Indian Income Tax Act 1961 /53/.
Minimum Alternative Tax	17%	As per Indian Income Tax Act 1961 /53/.	As per Indian Income Tax Act 1961 /53/.
Working Capital			



Receivables (no of days)	30	As per RERC order for “determination of tariff for sale of electricity from winds power plants in the state to distribution licensees” dated 16 July 2009 /42/.	DNV confirms that the value applied is consistent with RERC order for “determination of tariff for sale of electricity from winds power plants in the state to distribution licensees” dated 16 July 2009 /42/.
O & M expenses (no of days)	90	As per RERC order for “determination of tariff for sale of electricity from winds power plants in the state to distribution licensees” dated 16 July 2009 /42/.	DNV confirms that the value applied is consistent with RERC order for “determination of tariff for sale of electricity from winds power plants in the state to distribution licensees” dated 16 July 2009 /42/.

DNV has also checked that even after considering the insurance cost as zero, actual project cost /6/, actual tariff as provided in PPA /22/, actual interest rate /13/, loan tenure/13/, O & M cost and escalation as provided in RERC order /42/ the equity IRR for the project works out to be 9.48% which is still below the equity IRR benchmark adopted by the project proponent.

Calculation and conclusion

The equity IRR calculations and assumptions provided in a spreadsheet are consistent with the values provided in the detailed project report and have been cross checked by DNV. The calculations were verified and found to be in line with CDM EB’s guidance on assessment of investment analysis /37/. For the purpose of tax computation the project participant has considered the tax benefits from interest payments /16/. The assumptions used in the calculations are appropriate and have been verified by DNV. The equity IRR of the project over 20 years is 7.88% without the income from CERs /16/. The project is therefore not financially attractive compared to the benchmark of 16.84% in the absence of CDM benefits. With CDM revenue the equity IRR for the project activity crosses the benchmark applied for the project activity (19.13% equity IRR) /16/.

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, electricity tariff, debt equity ratio and loan tenure were checked by calculating the variation necessary to reach the benchmark and then discussing the likelihood for that to happen.

Decrease in capital cost: the total project cost considered in detailed project report was based on the budgetary offer received from Enercon (India) Limited dated 20 November 2009 /2/. However the total project cost for the project activity was verified to be only 2 772 million INR and has been verified by DNV from the actual purchase order placed to Enercon India Limited dated 5 December 2009 /6/. Even after considering the actual project cost, the equity IRR for the project works out to be 9.77% which is still below than the benchmark. With a decrease in project cost by 27.24% (from the cost considered in DPR, available at the time of



investment decision) the equity IRR becomes 16.85% thus exceeds the benchmark. However in DNV's opinion a decrease of 27.24% in project cost is unrealistic as the project activity is already commissioned; hence any decrease in project cost is not realistic.

Increase in electricity tariff: The electricity tariff of 4.28 INR/kWh considered in detailed project report was based on the RERC order for “determination of tariff for sale of electricity from winds power plants in the state to distribution licensees” dated 16 July 2009 /42/, applicable at the time of investment decision. As per the RERC order electricity tariff is fixed for 20 years, without any escalation (VAT is not applicable for sale of electricity as can be verified from recent sales invoice raised to state electricity board that no tax has been included in the invoice). With an increase of 40.66% (at electricity tariff of 6.02 INR/kWh) in electricity tariff the equity IRR becomes 16.89% thus exceeds the benchmark. However in DNV's opinion an increase of 40.66% in electricity tariff is highly unlikely as DNV has verified from the actual power purchase agreements signed for the project activity /22/ and recent sales invoices raised to state Discoms /23/ that the actual electricity tariff for the project activity is only 4.22 INR/kWh without escalation and is fixed for 20 years without any escalation. Hence the use of electricity tariff of 4.28 INR/kWh in investment analysis for the investment analysis is already on a conservative side. Hence this parameter is not considered sensitive for the project activity.

Increase in plant load factor: With an increase of 39.45% in plant load factor (at 29.84% PLF) the equity IRR becomes 16.86% and thus exceeds the benchmark. The PLF of 21.40% considered in the financial analysis is based on the independent third party electricity generation estimation report, prepared by Centre for Wind Energy Technology (an autonomous research and development institution under Ministry of New and Renewable Energy) dated 20 January 2010 /9/ for Enercon (India) Limited make WECs (E-53, 800 kW). Enercon (India) Limited, supplier of WECs has only provided the generation guarantee based on the 21.12% PLF in its budgetary offer dated 20 November 2009 /2/. Moreover the Rajasthan Electricity Regulatory Commission (RERC) has considered only a PLF of 21% for district of Jaisalmer in its final tariff order dated 16 July 2009 /42/ for the purposes of tariff working. Hence an increase of 39.45% in electricity generation to achieve a 29.84% PLF for Jaisalmer is highly unlikely.

Decrease in O&M cost: Even with no O&M costs the equity IRR for the project activity is 11.2%, which is lower than the benchmark return. Hence this parameter is not sensitive for the project activity.

Increase in debt equity Ratio: the debt equity ratio of 70:30 considered in detailed project report was based on the RERC order on “order for “determination of tariff for sale of electricity from winds power plants in the State to Distribution Licensees” dated 16 July 2009 /42/. Even after considering the scenario of project activity could have been financed 100% from equity (7.62%) the equity IRR from the project activity is below benchmark. Hence this parameter is not sensitive for the project activity.

Loan tenure: The loan tenure considered in detailed project report was based on the RERC order on “determination of tariff for sale of electricity from winds power plants in the state to distribution licensees” dated 16 July 2009 /42/. However the actual loan tenure was found to be 12 years and has been verified by DNV from the loan agreement signed with IDFC dated 30 April 2010 /13/. Even after considering the actual loan tenure, the equity IRR for the



project works out to be 7.71% which is below than the benchmark. Hence this parameter is not sensitive for the project activity.

Hence the project activity is financially not viable without the benefits from CDM.

4.6.4 Common practice analysis

The state of Rajasthan has been considered for assessing the common practice. DNV considers the selection of the region is appropriate as the policies, regulations and tariff orders for renewable energy is governed and implemented at the state level, albeit derived from those by the central government. All the wind power projects with capacity more than 15 MW size (comparable size) in state of Rajasthan were considered for common practice analysis. It has been verified by DNV from the wind power directory 2009 /54/, that the cumulative installed capacity of the individual wind projects with more than 15 MW is 301.5 MW from the beginning and this entire 301.5 MW capacity is under CDM pipeline which has been verified from the UNFCCC website (web-links for all these projects are included in PDD under common practice analysis section). A list of these projects with CDM links has been included in section B.5 of the PDD and same has been verified by DNV/1/. Hence it can be concluded that no other similar projects are available in state of Rajasthan, which needs to be considered for common practice analysis.

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

4.7 Monitoring

The project monitoring plan is in compliance with the monitoring methodology ACM0002 (version 12.1.0) /33/. The monitoring plan will give opportunity for real measurement of emission reductions achieved. 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 used is new equipment and not transferred from another activity.

It is DNV's opinion, that the project participant is able to implement the monitoring plan.

As required by DNA of India, project proponent has committed to spend 2% percentage of the CERs revenue every year for sustainable development including society/community development. The monitor-able action plan for the same has been included in section B.7.1 of the PDD /1/. DNV has verified from the commitment and monitor-able action plan made by project proponent from the undertaking submitted to DNA of India by project proponent dated 20 July 2010 /24/.

4.7.1 Parameters determined ex-ante

The combined margin emission coefficient for the north east west and north-eastern regional grid of India has been calculated at 0.92252 tCO₂e/MWh and is fixed *ex ante* for the entire fixed crediting period /41/. The CM emission factor value has been sourced from data by the Central Electricity Authority (CEA) of the Ministry of Power, Government of India /41/. CEA has published a database of carbon dioxide emission factors for the power sector in India based on detailed authentic information obtained from all operating power stations in the country. 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/41/. The emission



factors for coal and lignite were based on the values provided in India's Initial National Communication under the UNFCCC (Ministry of Environment & Forests, 2004) /43/. The emission factor for coal is supported by the results of an analysis of approximately 120 coal samples collected from different Indian coal fields. For all other fuels, default emission factors were derived from the IPCC 2006 Guidelines /44/. The OM sourced from 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 2006-07, 2007-08 and 2008-09 /41/. BM is calculated *ex-ante* based on the 20% most recent capacity additions in the north east west and north-eastern regional grid of India based on net generation for the year 2008-09 /41/. The operating margin has been determined to be 1.00498 tCO_{2e}/MWh and the build margin to be 0.6752 tCO_{2e}/MWh /41/. DNV confirms that the database version 5 used to calculate the combined margin emission factor was the latest database available at the time of start of validation and the combined margin emission factor for the north east west and north-eastern regional grid of India is fixed *ex-ante* for the entire crediting period.

4.7.2 Parameters monitored ex-post

The net electricity generated will be calculated from the readings of export and import indicated by the one set of Discom meter (main and check meter) at the substation. The meter reading at these metering points will be taken jointly by the representatives of Enercon (O & M contractor appointed by project proponent) and distribution company (Discom) in the form of Joint Meter Reading.

During the interview it was observed that wind turbines installed by the project proponent and wind turbines installed by other project owners will be connected to the grid through the same main meters in the substation. Hence the amount of electricity exported/imported to the north east west north eastern regional grid by individual project proponent is calculated by Enercon India limited based on the below mentioned apportioning formulae certified by Discom officials and reflects in the form of energy break up report, which is also certified by SEB officials. Based on this energy break up report, project proponents raise sales invoices to the distribution companies on monthly basis and has been verified by DNV from the energy breakup prepared by Enercon (India) limited and invoice raised to distribution companies by Enercon (India) limited. Hence the net electricity supplied to the grid figures as provided in the energy breakup report will be considered for the emission reduction calculations and same will be cross checked against the sales invoices raised to the state electricity board.

Hence the net electricity supplied by the project activity (by all WECs of project activity) to the north east west north eastern grid will be calculated as:

Calculation of Net Electricity Supplied to the grid:

$E_{JMR,Export}$ = Electricity exported, as recorded by the main meter at the substation

$E_{JMR,Import}$ = Electricity imported, as recorded by the main meter at the substation

$E_{Controller,Export}$ = Electricity exported by a WEC, as measured at the controller

$\sum E_{Controller,Export}$ = Electricity exported by all the WEC's (project as well as non project machines) connected to the main meter at the substation, measured at the controller of each WEC

$E_{WEC,Export}$ = Electricity exported by a WEC to the grid, calculated

$E_{WEC,import}$ = Electricity imported by a WEC from the grid, calculated



Electricity exported by each WEC is apportioned on the basis of electricity exported recorded at the controller of each WEC and the electricity exported at the main meter and mentioned in the JMR. The export multiplication factor is calculated as follows-

$$\text{Export Multiplication factor} = \frac{E_{\text{JMR,Export}}}{\sum E_{\text{Controller,Export}}} \dots\dots\dots (1)$$

Thus the energy exported by a WEC to the grid is given by the equation-

$$E_{\text{WEG,Export}} = \text{Export Multiplication factor} \times E_{\text{Controller,Export}} \dots\dots\dots (2)$$

As the controller meter doesn't record import, the apportioning of energy imported by each WEC is also done on the basis of electricity exported recorded at the controller of each WEC and the electricity imported at the main meter and mentioned in the JMR. The import multiplication factor is calculated as follows-

$$\text{Import Multiplication factor} = \frac{E_{\text{JMR,import}}}{\sum E_{\text{Controller,Export}}} \dots\dots\dots (3)$$

Thus the energy imported by a WEC to the grid is given by the equation-

$$E_{\text{WEG,import}} = \text{Import Multiplication factor} \times E_{\text{Controller,Export}} \dots\dots\dots (4)$$

The net electricity exported by the WECs of the project is given by the equation-

$$EG_y = \sum_{\text{Project}} E_{\text{WEG,Export}} - \sum_{\text{Project}} E_{\text{WEG,import}} \dots\dots\dots (5)$$

The summation is done on the WECs belonging to the project activity.

The main and check meter installed at the substation for will be sealed by distribution company and will be calibrated annually.

The main meter readings are apportioned based upon the LCS meter readings (controller readings) of the individual WEC's to compute net electricity supplied from individual WEC's. The LCS meter readings are archived electronically on continuous basis. Joint meter reading at the EB substation and at the pooling substation of Enercon is noted each month. Therefore cumulative LCS meter reading for each month is used for purpose of allocation of net electricity supplied to the grid from the project activity.

The LCS meters do not require calibration as the energy readings of electricity generated at the LCS meter is cross verified by the energy calculated by inverting system installed in the WEC's. In case there is any mismatch in the energy values recorded by the LCS meter and the energy values calculated by the inverting system; the machine will stop working and generate the error report. The WEC can be restarted only after the defective LCS meter is replaced with a new one by the operations and maintenance staff.

The QA/QC responsibility of individual tower reading lies with Enercon India Limited (O and M contractor for the wind farm). Enercon India Limited is an ISO 9001:2008 certified company and follows documentation practices to ensure the reliability and availability of data for all the activities as required from the site identification, logistic, construction



commissioning, operation, maintenance of the wind farm and have well established monitoring, recording and archiving system in place. All data used for emission reduction calculation will be archived for 2 years after the end of crediting period. Since the project involves electricity generation from wind sources, no emission is envisaged under project emissions or leakages due to the project activity.

4.7.3 Management system and quality assurance

The responsibility of overall project management lies with Vaayu (India) Power Corporation Private Limited. The main and check meters at the uploading station are two way meters with an accuracy class of 0.2% and are in custody of State electricity board. The readings in these meters are taken by State electricity board officials and used for billing purposes and will be used for calculation for the emission reductions from the project activity.

The energy meters will be calibrated by officials of State electricity board on annual basis. The monthly electricity sales receipts will also be archived until 2 years after the crediting period to facilitate cross-checking during the crediting period.

4.8 Algorithms and/or formulae used to determine emission reductions

The GHG emission calculations are well documented in line with the consolidated baseline and monitoring methodology ACM0002 version 12.1.0 /33/. 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 north east west north eastern grid of India, the baseline emissions have been estimated based on net electricity supplied to the grid by the project activity and the combined margin emission factor of north east west north eastern grid of India. In line with the guidance provided in the Tool to calculate the emission factor for an electricity system /35/, the weights for OM and BM have been taken as 75:25. The CM for the north east west north eastern grid of India has been calculated at 0.92252 tCO₂e/MWh in section 4.5.1 and is fixed *ex-ante* for the entire fixed crediting period.

Based on the calculations and results presented in the sections above the implementation of the project activity will result in an average *ex-ante* estimation of emission reduction conservatively calculated to be 87 159 tCO₂e per year for the selected fixed crediting period.

All assumptions and data used by the project participants are listed in the PDD and/or supporting documents, including their references and sources. All documentation used by the project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD. All values used in the PDD are considered reasonable in the context of the proposed CDM project activity. The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions. All estimates of the baseline, project and leakage emissions can be replicated using the data and parameter values provided in the PDD.

No other project emission or leakage sources contributing more than 1% and not mentioned by the methodology have been found.

4.9 Environmental impacts

As per the Ministry of Environment and Forests (MoEF), India Environment Impact Notification dated 1 December 2009 /18/, wind power projects are not covered under any schedule and thus environmental impact assessment is not required for the project activity. The project is not likely to create any adverse environmental effects. The project complies



with environmental regulations in India and the investors have received all the necessary clearances required for the project activity /8/ /27/.

4.10 Comments by local stakeholders

The local stakeholders were invited through National and local newspaper advertisements. The newspaper advertisements were given in Times of India on 19 February 2010 and on 24 February 2010 in Nafa Nuksan by Vaayu (India) Power Corporation Private Limited, the project proponent for the project activity /28/. Apart from newspaper advertisements, project proponent also invited the stakeholders via invitation letters /30/. The local stakeholder meeting for the project activity was conducted at service office of Enercon (India) Limited (O and M contractor), village Gorera in District Jaisalmer at Rajasthan on 10 March 2010 /29/. The local communities, farmers, officials of Gram Panchayat and contractors were invited to comment on the project activity. Detailed minute of meeting, along with list of attendees with their signature and photographs have been verified by DNV /29/. A detailed description of stakeholder consultation has been provided in section E of PDD.

The questions raised during the stakeholder consultation shows that the proposed project received support from the local people.

DNV considers the local stakeholder consultation carried out adequately.

4.11 Comments by Parties, stakeholders and NGOs

The PDD, version 01 dated 17 February 2010, was made publicly available on the CDM website

(<http://cdm.unfccc.int/Projects/Validation/DB/XX5R5JSYDBSBNH0XXIB6ZWQ9SQ0S3J/vjew.html>) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 23 April 2010 to 22 May 2010.

No comment was received during the 30 days period.

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APPENDIX A

CDM VALIDATION PROTOCOL

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	No Public funding is involved in project. 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		
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	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	CL-1 CL-2

Requirement	Reference	Conclusion
that would have occurred in the absence of the registered CDM project activity.		CL3 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 design document and comments have been made publicly available.	CDM Modalities and Procedures §40	OK
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. 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

Table 2 Requirements checklist

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
A General description of project activity						
A.1 Title of the project activity (VVM Para 55-57)						
A.1.1	Does section A.1 of the PDD include a clearly identifiable project title, version number of the PDD and date of the PDD?	/1/	DR	<input checked="" type="checkbox"/> Clearly identifiable title of the project activity <input checked="" type="checkbox"/> Version number of the PDD is included <input checked="" type="checkbox"/> Date of the PDD is included.		OK
A.1.2	Is the PDD is in accordance with the applicable requirements for completing PDDs?	/1/ /40/	DR	<input type="checkbox"/> Yes		OK
A.2 Description of the project activity (VVM Para 58-64 and VVM Para 135 and 136 (a) & (c) for small-scale project activities, as applicable)						
A.2.1	How was the design of the project assessed?	/1/ /2/ /3/ /4/ /6/	DR/I	<i>What type is the project?</i> <input type="checkbox"/> Project in existing facility or utilizing existing equipment(s) <input type="checkbox"/> Project is either a large scale project or a small scale project with emission reductions exceeding 15 000 tCO ₂ e per year. In this case, a site visit must be performed. <input type="checkbox"/> Project is a bundled small scale project, with each project in the bundle with emission reductions not exceeding 15,000 tCO ₂ e per year. In such case the number of physical site visits may be based on sampling, if the sampling size is appropriately justified through statistical analysis.		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				<input type="checkbox"/> The project is an individual small scale project activity with emission reductions not exceeding 15 000 tCO ₂ e per year. In this case, DOE may not conduct a physical site visit as appropriate. <input checked="" type="checkbox"/> Greenfield project <i>How was the design of the project assessed?</i> <input type="checkbox"/> Physical site inspection <input checked="" type="checkbox"/> Reviewing available designs and feasibility studies The proposed CDM project activity is installation of 63 numbers of Wind Energy Convertors (50.4 MW) each of 800 kW capacities (E-53). The WECs to be installed under the project has been designed by Enercon India Limited and will also be commissioned by Enercon India Limited. The electricity generated will be exported to the NEW NE grid of India. This is a greenfield project, wherein, the site activities are yet to be started. Since the project is in the preliminary stage of development and the hardware is yet to be installed at site, the site visit was not deemed necessary.		
A.2.2	If a greenfield project, describe the physical implementation of the project when the validation was commenced.	/1/ /6/	DR/I	At the time of commencement of the validation, the purchase orders were placed on EIL and the preparations are on for starting the civil works.		OK
A.2.3	If physical site visits were performed based on sampling (only applicable for bundled small scale projects, each with emission reductions not exceeding 15 000 tCO ₂ e per year), justify the sampling through a statistical analysis:	/1/	DR/I	Not applicable since the project activity is not a bundled small scale project.		OK
A.2.4	Is the description of the proposed CDM project activity as	/1/	DR	Yes. The proposed CDM project activity is	CAR-2	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
contained in the PDD sufficiently covers all relevant elements, is accurate and that it provides the reader with a clear understanding of the nature of the proposed CDM project activity?		/2/ /3/ /4/ /6/		installation of 63 numbers of Wind Energy convertors (50.4 MW) each of 800 kW capacities (E-53). The WECs to be installed under the project has been designed by Enercon India Limited and will also be commissioned by Enercon India Limited. The electricity generated will be exported to the NEW & NE grid of India. However unique identification number of WECs, their geographical co-ordinates and name of the substations to which the WECs of the project activity will be connected needs to be included in the PDD.		
A.2.5	Does the project activity involve alteration of existing installations? If so, have the differences between pre-project and post-project activity been clearly described in the PDD?	/1/ /6/	DR	The project is a green field project activity and hence this applicability criterion is not applicable for the project activity.	CAR-2	OK
A.2.6	Does the project design engineering reflect current good practices?	/1/ /2/ /3/ /4/ /6/	DR/I	The wind farm utilizes 63 machines of Enercon model E-53 WEC of 800 kW capacities which are approved by Centre for Wind Energy Technology, Government of India. The salient features of the E-53 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.2.7	Would the technology result in a significantly better performance than any commonly used technologies in the host country? Is any transfer of technology from any Annex-I Party involved?	/1/ /3/	DR/I	The technology is already available and widely used in the host country. There is no technology transfer from Annex-I party.		OK
A.3 Participation requirements (VVM Para 51-54, 125-127)						
A.3.1	Do all participating Parties fulfil the participation	/1/	DR	The Letter of Approval (LOA) from the DNA of	CAR-1	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
requirements as follows:		/31/		India (host) need to be provided for verification.		
		India (host)		County X		Country Y
a) Party has ratified the Kyoto Protocol		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No
b) Party has designated a Designated National Authority		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No
c) The assigned amount has been determined		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No
A.3.2	Do the letters of approval meet the following requirements?	/1/ /31/	DR	The Letter of Approval (LOA) from the DNA of India (host) need to be provided for verification.	CAR-1	OK
		India (host)		County X		Country Y
a) LoA confirms that Party has ratified the Kyoto Protocol		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No
b) LoA confirms that participation is voluntary		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No
c) The LoA confirms that the project contributes to the sustainable development of the host country?		<input type="checkbox"/> Yes <input type="checkbox"/> No		NA		NA
d) The LoA refers to the precise project activity title in the PDD		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No
e) The LoA is unconditional with respect to (a) to (d) above		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No
f) The LoA is issued by the respective Party's DNA		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No
g) The LoA was received directly by the DNA or the PP		<input type="checkbox"/> DNA <input type="checkbox"/> PP		<input type="checkbox"/> DNA <input type="checkbox"/> PP		<input type="checkbox"/> DNA <input type="checkbox"/> PP
h) In case of doubt regarding the authenticity of the letter of approval, describe how it was verified that the letter of approval is authentic		The Letter of Approval (LOA) from the DNA of India (host) is pending.				
A.3.3	Have all private/public project participants been authorized by an involved Party?	/1/ /31/	DR	Letter of Approval from DNA of India authorising Vaayu (India) Power Corporation Private Limited as project participant is pending.	CAR-1	OK
A.4 Technical description of the project activity (VVM Para 58-64)						
A.4.1	Is the project's location clearly defined?	/1/	DR/I	Yes, the project's spatial boundaries are defined. The project activity is spread across Sipla, Pithla,	CAR-2	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			Kotri, Senag, Barna and Khuri of Jaisalmer District of Rajasthan state in India. However unique identification number of WECs, their geographical co-ordinates and name of the substations to which the WECs of the project activity will be connected needs to be included in the PDD.		
A.5 Public funding of the project activity					
A.5.1 In case public funding from Parties included in Annex I is used for the project activity, have these Parties provided 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?	/1/	DR/I	The project does not involve any public funding and hence, no diversion of funds from official development assistance is expected.		OK
B Application of a baseline and monitoring methodology					
B.1 Methodology applied (VVM Para 65-76 and VVM Para 136 (b) for small-scale project activities, as applicable)					
B.1.1 Does the project apply an approved methodology and the correct and valid version thereof?	/1/ /33/	DR	The project correctly applies the approved baseline methodology "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" ACM 0002, version 11 for large scale CDM projects.	CAR-5	OK
B.1.2 If applicable, has any specific guidance provided by the CDM EB in respect to the applied methodology been considered?	/1/ /32/	DR	Not applicable for the project activity.		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.2 Applicability of methodology (and tools) (VVM Para 65-76) <i>Insert a row for each applicability criteria of the applied methodology (and tools)</i>						
B.2.1	How was it validated that project complies with the following applicability criteria: The methodology is applicable to grid connected renewable power generation project activities that (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).	/1/ /2/ /3/ /4/ /6/ /8/ /33/ /41/	DR/I	The project activity involves installation of new grid connected WECs for generation of power from wind energy to supply to the grid and is a green field project.		OK
B.2.2	How was it validated that project complies with the following applicability criteria: The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types: hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit;	/1/ /2/ /3/ /4/ /6/ /8/ /33/ /41/	DR/I	The project activity is a green field project that uses wind energy to generate electricity and hence this applicability criterion is not applicable for the project activity.		OK
B.2.3	How was it validated that project complies with the following applicability criteria: In the case of capacity additions, retrofits, replacements: the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.	/1/ /2/ /3/ /4/ /6/ /8/ /33/ /41/	DR/I	The project activity is a green field project that uses wind energy to generate electricity and hence this applicability criterion is not applicable for the project activity.		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.2.4	How was it validated that project complies with the following applicability criteria: The methodology is not applicable to the following a) Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site b) Biomass fired power plants c) Hydro power plants that result in new reservoir or increase in existing reservoirs where the power density of the power plant is less than 4 W/m ² .	/1/ /2/ /3/ /4/ /6/ /8/ /33/ /41/	DR/I	The project activity is a green field project that uses wind energy to generate electricity and hence this applicability criterion is not applicable for the project activity.		OK
B.2.5	Is the selected baseline on of the baseline(s) described in the methodology and this hence confirms the applicability of the methodology?	/1/ /33/	DR	Yes the selected baseline corresponds to “the baseline emissions are the product of electrical energy baseline EGBL, y expressed in kWh of electricity produced by the renewable generating unit multiplied by an emission factor” as prescribed in the applied methodology. $BE_y = EG_{BL,y} * EF_{CO2}$		OK
B.3 Project boundary (VVM Para 78-80)						
B.3.1	What are the project’s system boundaries (components and facilities used to mitigate GHGs)? Are they clearly defined and in accordance with the methodology?	/1/ /8/ /33/ /41/	DR/I	Yes, The project boundary includes – (i) The WECs of project activity spread across Sipla, Pithla, Kotri, Senag, Barna and Khuri of Jaisalmer District of Rajasthan state in India. (ii) The spatial boundary of the project also includes transmission network for the evacuation of electricity to the NEWNE grid to which the project activity is connected. The project boundary has been defined clearly in the PDD.		OK
B.3.2	Which GHG sources are identified for the project? Does the identified boundary cover all possible sources linked to the project activity? Give reference to documents considered to arrive at this conclusion.	/1/ /33/	DR	Baseline GHG sources identified for the project activity are CO ₂ – Included as it is the main emission source CH ₄ – Excluded as it is a minor emission source		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			N ₂ O – Excluded as it is a minor emission source No project activity emission and leakage for Wind power plant. This is in line with the applicable methodology ACM0002 version 11, Table 1.		
B.3.3 Does the project involve other emissions sources not foreseen by the methodologies that may question the applicability of the methodology? Do these sources contribute with more than 1% of the estimated emission reductions of the project?	/1/ /32/ /33/	DR	The project activity involves the installation of a 63 machines of Enercon model E-53 WECs of 800 kW capacities each to supply power to the NEWNE regional grid of India. As the power generated is being generated from wind energy, which is renewable in nature and does not involve any type of combustion of fuel. Hence there are no GHG emission sources in the project activity.		OK
B.4 Baseline scenario determination (VVM para 81-88, 105-107) <i>Ensure that the evaluation of all alternatives provided in the PDD and required by the methodology and also possible alternatives/offshoots of alternatives are discussed. Check that all alternatives required to be considered by the methodology are included in the final PDD. If baseline alternatives required to be considered by the methodology are considered not applicable, please assess the justification for this.</i>					
B.4.1 Which baseline scenarios have been identified? Is the list of baseline scenarios complete?	/1/ /32/ /33/ /34/	DR	Yes the baseline alternatives identified are in line with applied methodology ACM0002 version 11 and tool to demonstrate additionality version 5.2. As per the tool to demonstrate additionality version 5.2 in context of approved consolidated methodology ACM0002, project proponent only need to identify that there is at least one credible		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			and feasible alternative that would be more attractive than the proposed project activity. In line with tool and methodology project proponent has identified following alternatives: <ul style="list-style-type: none"> • Project activity not taken up as CDM project. • Equivalent amount of electricity being generated through operation of grid-connected power plants and addition of new generation sources. 		
B.4.2 How have the other baseline scenarios been eliminated in order to determine the baseline?	/1/ /16/ /17/ /32/ /34/	DR/I	Yes, It has been argued that implementation of project activity without CDM revenue is not economically attractive and hence cannot be considered as alternative to the project activity.		OK
B.4.3 What is the baseline scenario?	/1/ /32/ /33/ /34/ /35/ /41/	DR/I	In line with the applied methodology ACM0002 version 11, the baseline scenario identified is electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system”. The combined margin emission factor for the NEWNE regional grid of India has been sourced from CEA database version 05.		OK
B.4.4 Is the determination of the baseline scenario in accordance with the guidance in the methodology?	/1/ /32/ /33/ /34/ /35/ /41/	DR/I	Yes the baseline scenario has been identified in line with applied methodology ACM0002 version 11, the baseline scenario identified is 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		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system” version 02.		
B.4.5 Has the baseline scenario been determined using conservative assumptions where possible?	/1/ /32/ /33/ /34/ /35/ /41/	DR/I	In line with the applied methodology ACM0002 version 11, the baseline scenario identified is electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system”. The combined margin emission factor for the NEWNE regional grid of India has been sourced from CEA database version 05 and the value applied is 0.9225tCO ₂ e/MWh.		OK
B.4.6 Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/ /32/ /33/ /51/ /53/	DR/I	Yes, national and sectoral policies have been taken into consideration for selecting the baseline scenario.		OK
B.4.7 Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/ /32/ /33/ /35/ /41/	DR/I	The combined margin emission factor value has been sourced from data by the Central Electricity Authority (CEA) of the Ministry of Power, Government of India. CEA has published a database of carbon dioxide emission factors from the power sector in India based on detailed authenticated information obtained from all operating power stations in the country. This CO ₂		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			baseline database provides information about the OM and BM factors of all the regional electricity grids in India. DNV confirms that the CEA database version 05 used for calculation of combined margin emission coefficient for the NEWNE regional grid of India was the latest data available at the time of the commencement of validation (in line with the requirement of “Tool to calculate the emission factor for an electricity system”) and same was used during the webhosting of the PDD. The OM in the CEA database is calculated <i>ex-ante</i> using the simple OM approach based on the generation-weighted average emissions per electricity unit over a three year period of 2006-2007, 2007-2008 and 2008-2009. BM is calculated ex ante based on the 20% most recent capacity additions in the NEWNE grid based on net generation for the year 2008-09 as described in “Tool to calculate the emission factor for an electricity system” version 02, The operating margin has been determined to be 1.00498 tCO ₂ e/MWh and the build margin to be 0.6752 tCO ₂ e/MWh In line with tool, the weights for OM and BM are 0.75 and 0.25 respectively has been used to arrive at CM value and the value applied is 0.92252 tCO ₂ e/MWh.		
B.4.8 Is the baseline determination adequately documented in the PDD? <ul style="list-style-type: none"> All assumptions and data used by the project participants 	/1/ /32/ /33/	DR/I	In line with the applied methodology ACM0002 version 11, the baseline scenario identified is electricity delivered to the grid by the project		

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
<p>are listed in the PDD and related document to be submitted for registration. The data are properly referenced.</p> <ul style="list-style-type: none"> • 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 	/35/ /41/		<p>activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system”.</p> <p>The combined margin emission factor for the NEW & NE regional grid of India has been sourced from CEA database version 05 and the value applied is 0.92252tCO₂e/MWh.</p>		
B.5 Additionality determination (VVM Para 94-121 and VVM Para 137 for small-scale project activities, as applicable)					
B.5.1 What approach/tool does the project use to assess additionality? Is this in line with the methodology?	/1/ /32/ /33/ /34/	DR/I	The tool to demonstrate additionality version 5.2 has been used. Yes this is in line with the methodology for new grid connected renewable energy project.		OK
B.5.2 Have the regulatory requirements correctly been taken into account to evaluate the project activity and the alternatives?	/1/ /32/ /33/ /34/	DR/I	Yes the regulatory requirements have been taken into account to evaluate the alternatives to the project activity.		OK
B.5.3 Is sufficient evidence provided to support the relevance of the arguments made?	/1/ /32/ /33/ /34/	DR/I	Yes. The relevant documents have been provided for verification and this has been verified and found to be in order by DNV.		OK
B.5.4 What is the project additionality mainly based on (Investment analysis or barrier analysis)?	/1/ /32/ /33/ /34/	DR/I	The project additionality has been mainly based on investment analysis.		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
Prior consideration of CDM (VVM Para 98-103)						
B.5.5	What is the evidence for serious consideration of CDM prior to the time of decision to proceed with the project activity?	/1/ /6/ /10/ /11/ /38/	DR/I	<p>The start date of the project activity (5 December 2009) is after 2 August 2008 (CDM EB guidelines on CDM consideration).</p> <p>On 27 April 2010, the PP has notified the UNFCCC of the intention to seek CDM status for the project activity and got confirmation from UNFCCC on receipt of the email on 27 April 2010, which demonstrates prior consideration of CDM for the project activity.</p> <p>On 19 March 2010, the PP has notified the DNA of India of the intention to seek CDM status for the project activity and got confirmation from DNA via an email on 22 March 2010, which demonstrates prior consideration of CDM for the project activity.</p> <p>PP is requested to justify the delay of 4 months in notified the DNA of India and UNFCCC of the intention to seek CDM status for the project activity, when the purchase order was placed on 5 December 2009 and CDM revenue was the decisive factor to go ahead with the project activity.</p> <p>PP is also requested to include the chronology of events in PDD.</p>	CL5	OK
B.5.6	If the starting date is after 2 August 2008 and before the global stakeholder consultation, has the DNA and UNFCCC confirmed that the project participants have informed in writing of the project's intention to seek CDM status?	/1/ /6/ /10/ /11/ /38/	DR/I	<p>The start date of the project activity (5 December 2009) is after 2 August 2008 (CDM EB guidelines on CDM consideration).</p> <p>On 27 April 2010, the PP has notified the UNFCCC of the intention to seek CDM status for the project activity and got confirmation from UNFCCC on receipt of the email on 27 April</p>		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			2010, which demonstrates prior consideration of CDM for the project activity. On 19 March 2010, the PP has notified the DNA of India of the intention to seek CDM status for the project activity and got confirmation from DNA via an email on 22 March 2010, which demonstrates prior consideration of CDM for the project activity.		
Continuous efforts to secure CDM status (only to be completed if starting date is before 2 August 2008)					
B.5.7 What initiatives were taken by the project participants from the starting date of the project activity to the start of validation in parallel with the physical implementation of the project activity?	/1/ /6/ /10/ /11/ /38/	DR/I	The start date of the project activity is 5 December 2009 after 2 August 2008 (CDM EB guidelines on CDM consideration) and hence this is not applicable.		
Investment analysis (VVM Para 108-114) <i>The list of questions below must be adjusted to the parameters in the investment analysis relevant to the project under validation.</i>					
B.5.8 Does the project activity or any of the remaining alternatives generate revenues apart from CDM? Is this reflected in the PDD?	/1/ /32/ /33/ /34/ /37/	DR/I	Yes. The project activity generates revenue from sale of power to the grid and same is mentioned in the PDD.		OK
B.5.9 Do any of the alternatives to the project activity involve investment? Is this reflected in the PDD?	/1/ /32/ /33/ /34/ /37/	DR/I	No, The alternative to the project activity require investment and this is indicated in the PDD.		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.10 Is the choice of benchmark analysis, investment comparison or simple cost analysis correct?	/1/ /32/ /33/ /34/ /37/	DR/I	Yes, the project proponent has applied benchmark analysis to demonstrate the additionality of the project. This is inline with CDM EB guideline on assessment of investment analysis which states that “if the alternative to the project activity is the supply of electricity from a grid this is not to be considered an investment and a benchmark approach is considered appropriate”.		OK
B.5.11 Is the benchmark/discount rate the latest available at the time of decision?	/1/ /17/ /32/ /33/ /34/ /37/	DR/I	Yes the expected/required return on equity is used as benchmark and was available at the time of investment decision. The expected/required return on equity is calculated based on the PLR and equity returns considered are that at the time of decision making. This has been calculated based on the long term risk free rate applicable on long term investment made, published by RBI and market risk premium calculated based on market returns of various index of Sensex and beta values provided by Bloomberg. However, PP is requested to justify why expected/required return on equity is considered as suitable indicator to evaluate the financial viability of for the project activity as 70% of the project cost is funded through loan and without which investment in the project activity would have not been made by the PP. PP is also requested to include detailed procedure and values used to arrive at Benchmark.	CL	OK
B.5.12 What is the financial indicator? Is it on equity/project basis? Before/after tax? Is the financial indicator in correspondence with the benchmark?	/1/ /17/ /32/	DR/I	The financial indicator chosen by the project proponent for the purpose of investment analysis is post tax equity-IRR.		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	/33/ /34/ /37/				
B.5.13 Are the underlying assumptions appropriate, e.g. what is considered as waste in the baseline is considered to have zero value?	/1/ /32/ /33/ /34/ /37/	DR/I	This is not applicable as the project activity is electricity generation from wind energy.		OK
B.5.14 Does the income tax calculation take depreciation into account? Is the depreciation year in accordance with normal accounting practice in the host country?	/1/ /16/ /32/ /33/ /34/ /37/ /53/	DR/I	Yes. Income tax calculation considers depreciation as permissible under the income tax act. The depreciation considered is as per the accounting practice allowable for such type of projects as per the Income tax act of India		OK
B.5.15 Is the time period of the investment analysis and operating time of the project realistic? Has salvage value been taken into account? Is working capital returned in the last year of operation?	/1/ /3/ /16/ /32/ /33/ /34/ /37// 42/	DR/I	20 years operating life has been considered which is realistic for WEG and has been verified from certificate from technology supplier. A salvage value of 10% of equipment cost has been considered for investment analysis and has been added back in cash flow in the last year of operation of project activity and is line with the Rajasthan Electricity Regulatory Commission (RERC) guidance on renewable energy projects dated 16 July 2009. For Land 100% value of land has been added back to cash flow in last year of operation. PP is requested to justify why working capital is not added back in last year of operation in financial analysis sheet.	CL2	OK
B.5.16 When a feasibility study report or similar approved by the	/1/	DR/I	The investment decision was made on the basis	CL3	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
government is used as the basis for the investment analysis: Can it be confirmed that the values used in the PDD are fully consistent with the FSR and is the period of time between finalization of the FSR and the investment decision adequate?	/2/ /3/ /4/ /6/ /9/ /16/ /32/ /33/ /34/ /37/ /42/		of the detailed project report (DPR) of 26 November 2009, which is prepared based on the quotation received from Enercon India Limited. The DPR for the project activity was prepared on 26 November 2009, whereas the purchase order was placed on 5 December 2009. Hence given this short period of time between the detailed project report preparation and the decision to proceed with the project activity. It is thus reasonable to assume that the DPR was the basis for the approval for the project activity. No the PLF value provided in DPR is not consistent with the values used in investment analysis and PDD.		
B.5.17 How was the amount of output (e.g. sales of electricity) assessed? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.	/1/ /2/ /4/ /6/ /9/ /16/ /36/	DR/I	<input type="checkbox"/> The plant load factor provided to banks and/or equity financiers while applying the project activity for project financing, or to the government while applying the project activity for implementation approval <input checked="" type="checkbox"/> The plant load factor determined by a third party contracted by the project participants (e.g. an engineering company) <input type="checkbox"/> Other approach. The PLF is determined by C-WET, the third party engaged by the PP. Copy of the report of C-WET has been provided for verification. However, PP is requested to clarify the difference in value of PLF provided in the DPR (21.12%) and value used in the investment analysis (21.40%).	CL3	OK
B.5.18 How was the output price (e.g. electricity price) assessed? Were the data available and valid at the time of decision?	/1/ /2/	DR/I	<input checked="" type="checkbox"/> Cross-check against third-party or publicly available sources (e.g. invoices or price indices)	CL3	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.	/4/ /6/ /16/ /22/ /23/		<input type="checkbox"/> Review of feasibility reports, public announcements and annual financial reports related to the project and the project participants The electricity tariff considered is based on the latest tariff order of RERC as at the time of decision making. Since the PPA for the project activity is not signed yet, PP is requested to demonstrate through electricity tariff availed by other power proponent in recent past that the electricity tariff considered is reasonable.		
B.5.19 How were the investment costs assessed? Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.	/1/ /2/ /4/ /6/ /16/	DR/I	<input checked="" type="checkbox"/> Cross-check against third-party or publicly available sources (e.g. invoices or price indices) <input checked="" type="checkbox"/> Review of feasibility reports, public announcements, contracts and annual financial reports related to the project and the project participants The investment costs were assessed based on the offer from Enercon for the supply of WECs and the DPR. It was cross checked against the purchase order placed on Enercon. Since the DPR for the project activity is not prepared by independent third party, PP is also requested to compare these input values with other wind power project commissioned in the region in recent past to justify the reasonableness of the input values used in investment analysis.	CL3	OK
B.5.20 How were the O&M costs assessed? Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.	/1/ /2/ /4/ /6/ /9/ /16/	DR/I	<input type="checkbox"/> Cross-check against third-party or publicly available sources (e.g. invoices or price indices) <input checked="" type="checkbox"/> Review of feasibility reports, public announcements and annual financial reports related to the project and the project participants The O&M costs were assessed based on the offer	CL3	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<p>from Enercon for the same and with that considered in the DPR.</p> <p>However, the PP is requested to provide copies of the PPA and O&M contract awarded for the project activity for verification.</p>		
<p>B.5.21 Describe the assessment of the other input parameters. Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.</p>	<p>/1/ /2/ /4/ /6/ /9/ /16/</p>	<p>DR/I</p>	<p><input type="checkbox"/> Cross-check against third-party or publicly available sources (e.g. invoices or price indices)</p> <p><input checked="" type="checkbox"/> Review of feasibility reports, public announcements and annual financial reports related to the project and the project participants</p> <p>All the input parameters used in the financial calculation excel sheet are relevant at the time of decision making. References and supporting documents are also provided.</p> <p>However, the PP is requested to provide copy of supporting document for the insurance charges for verification.</p> <p>Further, PP is requested to clarify the mismatch in the loan re-payment period, 12 years stated in the loan sanction letter of IDFC and 10 years considered in the DPR and financial analysis.</p> <p>PP is also requested to clarify why the generation based subsidy of 0.50 INR/kWh is not considered in the financial analysis.</p>	<p>CL3</p>	<p>OK</p>
<p>B.5.22 Was the financial calculation spreadsheet verified and found to be correct?</p>	<p>/1/ /16/</p>	<p>DR</p>	<p>The financial calculation spread sheet has been checked and clarification stated above has been asked and based on the PP response final conclusion will be made.</p>		<p>OK</p>
<p>B.5.23 Sensitivity analysis: Have the key parameters contributing to more than 20% of the revenue/costs during operating or implementation been identified? Has possible correlation between the parameters been considered?</p>	<p>/1/ /16/</p>	<p>DR/I</p>	<p>Yes, PP has carried a sensitivity analysis to analyse the effect of $\pm 10\%$ variation in electricity generation, tariff, debt equity ratio and capital cost of the project and it has demonstrated that</p>	<p>CL3</p>	<p>OK</p>

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				even after $\pm 10\%$ variation the equity IRR for the project remains below than the applied benchmark. The sensitivity analysis need to be performed in the parameters till they touch the benchmark and the likelihood of that being achieved need to be indicated.		
B.5.24	Sensitivity analysis: Is the range of variations is reasonable in the project context?	/1/ /16/	DR	Please refer to B.5.26	CL3	OK
B.5.25	Have the key parameters been varied to reach the benchmark and the likelihood of this to happen been justified to be small?	/1/ /16/	DR	Please refer to B.5.26	CL3	OK
Barrier analysis (VVM para 115-118)						
B.5.26	Are the barriers identified complimentary to a potential investment analysis? Does the barrier have a clear impact on the financial returns so that it can be assessed in an investment analysis? Each barrier is discussed separately.	/1/ /34/	DR	Not chosen.		OK
Common practice analysis (VVM Para 119-121)						
B.5.27	What is the geographical scope of the common practice analysis? Is this justified?	/1/ /34/ /54/	DR/I	The state of Rajasthan has been considered for assessing the common practice. Since the policies and tariff regime is consistent throughout the state of Rajasthan, DNV considers the selection of the region is appropriate. In State of Rajasthan all wind projects above 15MW has been considered for common practice analysis. It was noted that all wind power project from single investor above 15MW is under CDM pipeline. Hence it has been demonstrated that investment in large scale wind power project in Rajasthan is not a common practice.		OK
B.5.28	What is the scope of technology and size (e.g. capacity of	/1/	DR/I	The state of Rajasthan has been considered for		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
power plant) for the common practice analysis and how has this been justified?		/34/ /54/		assessing the common practice. Since the policies and tariff regime is consistent throughout the state of Rajasthan, DNV considers the selection of the region is appropriate. In State of Rajasthan all wind projects above 15MW has been considered for common practice analysis. It was noted that all wind power project from single investor above 15MW is under CDM pipeline. Hence it has been demonstrated that investment in large scale wind power project in Rajasthan is not a common practice.		
B.5.29	What is the data source(s) used for the common practice analysis?	/1/ /34/ /54/	DR/I	The data for common practice analysis is sourced from the Directory Indian Wind Power 2009 and UNFCCC website.		OK
B.5.30	How many similar non-CDM-projects exist in the region within the scope?	/1/ /34/ /54/	DR/I	There are 9 other projects in state of Rajasthan, above 15 MW, implemented by single investor and all these projects are under CDM pipeline and have been excluded from common practice analysis.		OK
B.5.31	How were possible essential distinctions between the project activity and similar activities assessed?	/1/ /34/ /54/	DR/I	No comparable project was found.		OK
B.5.32	What is the conclusion of the common practice analysis?	/1/ /34/ /54/	DR	It has been demonstrated that investment in large scale wind power project in Rajasthan is not a common practice.		OK
Conclusion						
B.5.33	What is the conclusion with regard to the additionality of the project activity?	/1/ /16/	DR/I	To be concluded, once response to the clarification raise for investment analysis are provided by PP.	CL3	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.6 Calculations of GHG emission reductions						
Data and parameters that are available at validation and that are not monitored (VVM Para 199-203)						
B.6.1	How was the $EF_{OM,y}$ Operating Margin Emission Factor of NEWNE Electricity Grid verified?	/1/ /35/ /41/	DR/I	The OM emission factor has been computed using the simple OM approach based on the generation-weighted average emissions per electricity unit over a three year period of 2006-2007, 2007-2008 and 2008-2009 available in the CEA database version 5, for the NEW & NE regional grid, in line with approach prescribed in "Tool to calculate the emission factor for an electricity system" version 02. This is fixed ex-ante value and the value applied is 1.00498 tCO ₂ e/MWh. DNV verified from the values applied for OM calculation from CEA website. The calculation is also found to be correct.		OK
B.6.2	How was the $EF_{BM,y}$ Build Margin Emission Factor of the NEWNE Electricity Grid verified?	/1/ /35/ /41/	DR/I	BM is calculated <i>ex-ante</i> based on the 20% most recent capacity additions in the grid based on net generation for the year 2008-09, in accordance with "Tool to calculate the emission factor for an electricity system" version 02. This value is sourced from CEA database version 5. This is fixed ex-ante value and the value applied is 0.6752 tCO ₂ e/MWh.		OK
B.6.3	How was the EF_{yCM} Emission Factor for the NEWNE grid of India verified?	/1/ /35/ /41/	DR/I	The baseline emission factor for the project has been calculated as the weighted average of the operating margin (OM) and the build margin (BM) in the ratio of 75:25 as applicable for wind projects. The CM thus arrived is 0.92252 t CO ₂ /MWh. DNV verified the calculation and		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				found it to be in order.		
Baseline emissions (VVM Para 89-93)						
B.6.4	Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /35/ /41/	DR/I	<p>Baseline emissions have been estimated as the product of net electricity supplied to the NEW & NE regional grid by the project activity per year and grid emission factor of the NEW & NE regional grid, which has been obtained from the official website of the Central Electricity authority (CEA) <i>CO₂ Baseline Database for the Indian Power Sector User Guide - Version 5.0.</i></p> <p>Baseline emission factor for the NEW & NE regional grid is established ex-ante based on the approved methodology using a combined margin approach consisting 75% operating margin and 25% build margin approach.</p> <p>The baseline emission factor for the project has been calculated as the weighted average of the operating margin (OM) and the build margin (BM) in the ratio of 75:25 as applicable for wind projects. The CM thus arrived is 0.92252 t CO₂/MWh.</p>		OK
B.6.5	Have conservative assumptions been used when calculating the baseline emissions?	/1/ /35/ /41/	DR/I	Yes. Conservative assumptions have been used while calculating the baseline emissions.		OK
B.6.6	Are uncertainties in the baseline emission estimates properly addressed?	/1/ /35/ /41/	DR/I	There are no uncertainties in the baseline emissions.		OK
Project emissions (VVM Para 89-93)						
B.6.7	Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /33/	DR	Since the project activity is electricity generation from wind energy there is no project GHG emission and this complies with the methodology		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				with respect to project emission computation.		
Leakage (VVM Para 89-93)						
B.6.8	Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /33/	DR	This is not applicable as the project activity is electricity generation from wind energy.		OK
Emission Reductions (VVM Para 89-93)						
B.6.9	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 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. 	/1/ /33/	DR	All the assumptions and data used by the project participants are listed in the PDD and the data are properly referenced.		OK
B.7 Monitoring plan (VVM Para 122-124)						
Data and parameters monitored						
B.7.1	Do the means of monitoring described in the plan comply with the requirements of the methodology?	/1/ /32/ /33/	DR/I	No, PP is requested to justify how the current monitoring arrangement defined in the PDD meets the requirement of the applied version of methodology, which requires Quantity of net electricity generation supplied by the project plant/unit to the grid in year need to be monitored, whereas the current arrangement mentioned in the PDD calculates net electricity based on the apportioning of electricity recorded by the common meter (meter to which machines of other investors are also connected).	CL4	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				PP is also requested to explain the detailed procedures of apportioning in Annex 4 of the PDD.		
B.7.2	Does the monitoring plan contains all necessary parameters, and are they clearly described?	/1/ /32/ /33/	DR/I	Refer section B.7.1 of the report.	CL 4	OK
B.7.3	In case parameters are measured, is the measurement equipment described? Describe each relevant parameter.	/1/ /32/ /33/	DR/I	Refer section B.7.1 of the report.	CL 4	OK
B.7.4	In case parameters are measured, is the measurement accuracy addressed and deemed appropriate? Describe each relevant parameter.	/1/ /32/ /33/	DR/I	Refer section B.7.1 of the report.	CL 4	OK
B.7.5	In case parameters are measured, are the requirements for maintenance and calibration of measurement equipment described and deemed appropriate? Describe each relevant parameter.	/1/ /32/ /33/	DR/I	Refer section B.7.1 of the report.	CL 4	OK
B.7.6	Is the monitoring frequency adequate for all monitoring parameters? Describe each parameter.	/1/ /32/ /33/	DR/I	Refer section B.7.1 of the report.	CL 4	OK
B.7.7	Is the recording frequency adequate for all monitoring parameters? Describe each parameter.	/1/ /32/ /33/	DR/I	Refer section B.7.1 of the report.	CL 4	OK
Ability of project participants to implement monitoring plan						
B.7.8	How has it been assessed that the monitoring arrangements described in the monitoring plan are feasible within the project design?	/1/ /32/ /33/	DR/I	Unless the issue of current monitoring arrangement is in line with the methodology issue in not resolved no conclusion can be drawn in this regard.	CL 4	OK
B.7.9	Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and	/1/ /32/	DR/I	Yes. For the operation and maintenance of the facility contract has been entered with Enercon	CAR 3	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
how to process performance documentation)?		/33/		(India) Limited and they will be providing daily generation report. The QA/QC procedures indicated in Annex 4 need to be further formalized by including the role of PP and the requirements of CDM.		
B.7.10	Are the data management and quality assurance and quality control procedures sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported ex post and verified?	/1/ /32/ /33/	DR/I	Yes. The systems and procedures detailed are adequate to ensure the verification of emissions reductions from the project activity.		OK
B.7.11	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/ /32/ /33/	DR/I	PP is requested to indicate in the PDD that the monitored data will be archived for two years after the crediting period.	CAR-4	OK
Monitoring of sustainable development indicators/ environmental impacts						
B.7.12	Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/ /31/	DR	As per recent approvals issued by DNA of India, for large scale CDM projects activities have to spend 2% of the revenue earned through CDM for sustainable development of society/community development. These approvals also state that PP has to make action plan for the same and these needs to be included in the PCN & PDD. However this action plan is not clear from webhosted PDD. PP is requested to provide the DNA approval for the project activity for confirmation and in case if the DNA approval talks about the same this needs to be incorporated in the revised PDD.	CAR-4	OK
B.7.13	Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social	/1/ /31/	DR	The monitoring plan does not provide for the collection and archiving of relevant data	CAR-4	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
and economic impacts?			concerning environmental, social and economic impacts and this is not warranted by the current legislation. However PP is requested to detail the action plan for monitoring 2% of the CER revenue to be spent on sustainable development activities of the local population.		
B.7.14 Are the sustainable development indicators in line with stated national priorities in the host country?	/1/ /31/	DR	The Letter of approval from the DNA of India needs to be submitted for verification	CAR-1	OK
C Duration of the project activity / crediting period					
C.1.1 Start date of project activity (VVM Para 99-100, 104)					
C.1.2 How has the starting date of the project activity been determined? What are the dates of the first contracts for the project activity? When was the first construction activity?	/1/ /3/ /6/	DR/I	The start date of the project activity is stated to be 5 December 2009, which is the date of purchase order placed for the supply of WECs of the project activity. The purchase order dated 5 December 2009as been verified by DNV.		OK
C.1.3 Is the stated expected operational lifetime of the project activity reasonable?	/1/ /3/ /6/	DR/I	The operational lifetime of the project activity has been mentioned as 20 years which is reasonable and has been verified by DNV from certificate provided by technology supplier.		OK
C.1.4 Is the start date, the type (renewable/fixed) and the length of the crediting period clearly defined and reasonable?	/1/	DR	The project has chosen a fixed crediting period of 10 years with the start date of the crediting period being 1 April 2011.	CAR-6	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
D Environmental Impacts (VVM Para 131-133 and VVM Para 136 (d) for small-scale project activities, as applicable))					
D.1.1 Are there any host country requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved? Does the approval contain any conditions that need monitoring?	/1/ /8/ /27/	DR/I	Indian legislation in vogue does not warrant an EIA to be done for this type of project activity. PP has received all relevant approval and clearances like, for evacuation of power and land clearances from Rajasthan Renewable Energy Power Corporation for the project activity.		OK
D.1.2 Does the project comply with environmental legislation in the host country?	/1/ /18/	DR/I	As per the Ministry of Environment and Forests (MoEF), India Environment Impact Notification dated 1 December 2009, wind power projects are not covered under any schedule and thus environmental impact assessment is not required for the project activity. As per the present statutes no specific environmental clearances are required for wind energy based power generation projects in India.		OK
D.1.3 Will the project create any adverse environmental effects?	/1/ /18/	DR/I	Being wind energy based power project, the project is not expected to have any significant impact on the environment.		OK
D.1.4 Have identified environmental impacts been addressed in the project design?	/1/ /18/	DR/I	No negative impact has been identified.		OK
D.1.5 Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/ /18/	DR/I	Being wind energy based power project, no adverse environmental impacts are foreseen.		OK
D.1.6 Are transboundary environmental impacts considered in the analysis?	/1/ /18/	DR/I	As, the proposed project activity is wind energy based power generation, the impacts are expected to be minimal.		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
E Stakeholder Comments (VVM Para 128-130)					
E.1.1 Have relevant stakeholders been consulted?	/1/ /28/ /29/ /30/	DR/I	Yes. The stake holders meeting on 10 March 2010. The stakeholder meeting was conducted at village Gorera in Jaisalmer district at Rajasthan.		OK
E.1.2 Have appropriate media been used to invite comments by local stakeholders?	/1/ /28/ /29/ /30/	DR/I	Yes. The local stakeholders were invited through newspaper advertisement and individual invitation letters sent to village representatives. The advertisement was published in national newspaper, Times of India on 19 February 2010 and local language newspaper Nafa Nuksan on 24 February 2010 by project proponent. Newspaper advertisements, invitation letter sent to village representatives, attendance sheet and minutes of meeting has been verified by DNV.		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/ /18/	DR/I	As per the Ministry of Environment and Forests (MoEF), India Environment Impact Notification S.O. 1533 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.		OK
E.1.4 Is a summary of the stakeholder comments received provided?	/1/	DR/I	A summary of the comments received has been provided in the PDD.		OK
E.1.5 Has due account been taken of any stakeholder comments received?	/1/ /28/ /29/	DR/I	No adverse comments have been received for the project activity.		OK

Table 3 Resolution of corrective action requests and clarification requests

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
CAR 1 The Host Country Approval from DNA of India needs to be provided for verification. Confirmation of voluntary participation by the party involved in the project activity needs to be provided for verification. As per recent approvals issued by DNA of India, for large scale CDM projects activities have to spend 2% of the revenue earned through CDM for sustainable development of society/community development. These approvals also state that PP has to make action plan for the same and these needs to be included in the PCN & PDD. However this action plan is not clear from webhosted PDD. PP is requested to provide the DNA approval for the project activity for confirmation and in case if the DNA approval talks about the same this needs to be incorporated in the revised PDD.	Table 1 A.3.1 A.3.2 A.3.3 B.7.12 B.7.13 B.7.14	Host country approval from DNA of India has been provided to DoE for verification. The action plan on spending 2% of the revenue earned through CDM for sustainable development has been incorporated in the PDD under section B.7.2.	The letter of Approval received from DNA of India dated 18 July 2011 has been verified by DNV. As required by DNA of India, project proponent has committed to spend 2% percentage of the CERs revenue every year for Sustainable Development including society/community development. The monitor-able action plan for the same has been included in section B.7.1 of the PDD. DNV has verified from the commitment and monitor-able action plan made by project proponent from the undertaking submitted to DNA of India by project proponent dated 20 July 2010. OK Accepted CAR 1 is closed.
CAR 2 Unique identification number of WEGs, their geographical co-ordinates and name of the substations to which the WEGs of the project activity will be connected needs to be included in the PDD. CAR 2 pending DNV found that for one WEC geo coordinates mentioned is not matching with the geo coordinate provided in the webhosted PDD.	A.2.4 A.4.1	The wind resource department of Enercon has proposed 72 coordinate out of which 63 coordinates has been selected for final erection and commission of the machine. We have provided all 63 shortlisted coordinates in the PDD that will be selected for commissioning of 63 turbines. The geo coordinate of one WEC mentioned in the webhosted PDD has been allotted to some other project proponent. The same was not known to the project proponent	Geo coordinates with unique identification of WECs are now included in revised PDD version 02. DNV found that for one WEC geo coordinates mentioned is not matching with the geo coordinate provided in the webhosted PDD. CAR 2 Pending DNV has checked that the revised geo coordinate provided for the one WEC which was different from the geo coordinate mentioned in the initial

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		<p>during the initial stage of implementation of the project. The change has been rectified and confirmed location number of 63 WECs has been incorporated in the revised PDD.</p> <p>The revised geo coordinate has no impact on the plant load factor of the project activity as it falls under the same village & district which has been mentioned in the PDD.</p>	<p>webhosted PDD belongs to same village and district. Hence this minor change in geo coordinate will not have any significant impact on the additionality of the project and will not going to make project additional. The correct geo coordinate of the WEC is now included in revised PDD version 03.</p> <p>OK Accepted.</p> <p>CAR 2 is closed.</p>
<p>CAR 3</p> <p>The QA/QC procedures indicated in Annex 4 need to be further formalized by including the role of PP and the requirements of CDM.</p>	B.7.9	<p>The project proponent is Vaayu (India) Power Corporation Private Limited. The PP will be keeping and monitoring the data for electricity generation and calibration reports post project implementation. Enercon (India) Limited will be the O&M contractor who will be having the responsibility of for activities such as maintaining electricity generation records, calibration records and maintenance of the WECs (Wind Energy Convertors). The QA/QC procedures has been revised to detail the responsibility of the PP and Enercon in respect of data archiving, internal audits and procedures to address data uncertainty in annex 4 of the PDD.</p>	<p>A detailed QA/QC procedure with clear roles and responsibility has been formalized and now included in Annex 4 of the revised PDD version 03.</p> <p>Revised PDD version 03 has been reviewed by DNV.</p> <p>OK Accepted.</p> <p>CAR 3 is closed.</p>
<p>CAR 4</p> <p>PP is requested to indicate in the PDD that all the monitored data will be archived for two years after the end of the crediting period.</p>	B.7.11	<p>Same has been incorporated in the PDD under section 7.1 and 7.2 of the revised PDD.</p>	<p>Necessary changes have been incorporated in revised PDD version 03.</p> <p>Revised PDD version 03 has been reviewed by DNV.</p> <p>OK Accepted.</p> <p>CAR 4 is closed.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
CAR 5 Project proponent is requested to revise the applied version of methodology as validation of the project activity could not be concluded in time.	B.1.1	Revised PDD applying version 12.1.0 of the methodology has been submitted to DOE.	Revised PDD based on the latest version of the applied version of the methodology has been submitted by project proponent. Revised PDD version 03 has been reviewed by DNV. OK Accepted. CAR 5 is closed.
CAR 6 PP is requested to revise the start date of crediting period from 1 April 2011, in line with the revised timelines of validation.	C.1.4	Start date of the crediting period has been revised from 1 April 2011 to 1 October 2011.	The start date of the crediting period is revised from 31 March 2011 to 1 October 2011. Revised PDD version 03 has been reviewed by DNV. OK Accepted. CAR 6 is closed.
CL 1 PP is requested to justify why expected/required return on equity is considered as suitable indicator to evaluate the financial viability of for the project activity as 70% of the project cost is funded through loan and without which investment in the project activity would have not been made by the PP. PP is also requested to include detailed procedure and values used to arrive at Benchmark.	B.5.14	Tariff Policy notified by the Government of India stipulates a debt-equity ratio of 70:30 for financing power projects. However in order to attain loan from financial institution project proponent have to commit at least 30% of the project cost and the commitment of project proponent is subject to its expected return of its 30% equity. Since the project proponent is an equity investor in the project. The decision to invest or not to invest is based on the returns generated by the equity investment, represented by the post tax Equity IRR. As per Para 12 of the Guidance to Investment Analysis states that required returns on equity is appropriate benchmark for Equity IRR. Therefore the cost of equity	The benchmark selected for the project activity is as per the CDM EB guidance on assessment of investment analysis. The project activity is electricity generation based on wind energy which could be developed by an entity other than project participant. The benchmark should thus be based on publicly available data sources. The financial indicator applied for the project activity is equity IRR and the benchmark used for the project activity is required rate of return on equity for the project has been calculated using the Capital Asset Pricing Model (CAPM). As per CAPM, the required return on equity investment is the return of a risk-free security plus beta times the difference

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		<p>is considered appropriate benchmark. Accordingly, the post tax Equity IRR has been considered as the relevant financial indicator for Investment Analysis.</p> <p>Moreover the CDM revenues was decisive factor to go ahead with the project can also be loan sanction letter from the bank in which bank has also considered the CDM processing fess while granting the loan for the project.</p> <p>Beta values are representative of volatility of the stock over the market index. We have considered major players that are active in power sector in India. The values are directly derived from the third party data source (Bloomberg). The average of the beta returns of the power stocks is considered in order to determine the beta applicable for the project activity. The beta for the various power stocks ranges from 0.96 to 1.57 for Gujarat Industries and Reliance respectively. Therefore we have considered the average beta that will be reflective of the volatility of the power stocks vis-à-vis market index. The same have been incorporated in the PDD.</p> <p>As per principles of corporate finance require that Beta need to be adjusted to reflect the change in financing mix between the project and the listed power companies. However, since the power company's</p>	<p>between the market return and the risk-free return. The Government Securities have been taken to represent the risk free return. Stock index has been used to represent the market return. Power Industry specific beta value is applied to represent the market returns relevant to the risk of the project activity sector. The suitability of the benchmark and the appropriateness of the calculations adopted has been verified and accepted based on Financial Management: Theory and Practice book written by Professor Prasanna Chandra (Director, Centre for Financial Management and ex professor of finance at IIM- Bangalore). The key parameters of the CAPM model have been calculated as follows:</p> <ul style="list-style-type: none"> • An average government bond rate (risk free rate) applicable at the time of investment decision (in November 2009) for long term investment (for 20 years) has been considered. The project participant has sourced this value ($R_f = 7.98\%$ for the period from June 2009 to September 2009) from the monthly bulletin on government securities market published by Reserve Bank of India. Reserve Bank of India is the central controlling bank and its database is an official source of information in India. DNV accepted this value as it has been

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		<p>equity ratios are lower than that of the project activity, any subsequent adjustment on account of change in debt: equity mix will result in a higher beta value and higher benchmark.</p> <p>We have incorporated the results of re-levering in the spreadsheet to demonstrate the conservativeness of the beta values. The average re-levered beta works out to be 2.13 which is less than the average raw beta of 1.17. Hence the use of average raw beta is conservative and appropriate. Calculations for the same are included in revised Benchmark analysis sheet submitted to DoE.</p>	<p>sourced directly from the RBI report and was latest at the time of investment decision. DNV has further cross checked historical value for average risk free rates in India for the 5 years preceding the project investment decision confirming that the chosen value is reasonable.</p> <ul style="list-style-type: none"> • Market return ($R_m = 15.55\%$) or Compound Accumulated Growth Rate (CAGR): In India the market return can be calculated from the following available indices: (i) BSE-Sensex, (ii) BSE-200 and (iii) BSE-500 (iv) BSE 100. Hence the project proponent has calculated the market return from all these indices from the start date of the indices till date of investment and the minimum market return indices has been used for the market return calculation. The minimum market return was offered by BSE 200 (15.5%) and hence conservatively same has been applied for the benchmark calculation. • The average raw equity beta value of 1.17 (coefficient reflecting the volatility of the stock relative to the market) is calculated over the period of five year (31 October 2004 to 25 October 2009) using BSE index of

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			<p>the market portfolio for the companies in the power sector that were listed at the time of decision making: Tata Power (1.029), CESC limited (1.105), Reliance Energy (1.569), Gujarat Industries (0.961) and Energy Development (1.187). These values were sourced from Bloomberg web site and screenshots of the same are provided in Appendix 3 of PDD.</p> <ul style="list-style-type: none"> • The time period of five year considered for equity beta value calculation is justified as per Credit Rating Information Services of India limited (CRISIL) recommendations to CERC and it was recommended by financial experts in the report that, for such economies, and for companies whose capital structure and operating environment has been changing, the time period over which equity beta is calculated should be small, as in case of power sector in India which went significant restructuring after electricity act 2003. This ensures that the risk profile of the company vis-à-vis the market is relatively stable over the term over which equity beta is being calculated. • Though the principles of corporate

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			<p>finance require that equity Beta need to be adjusted to reflect the change in financing mix between the project and the listed power companies. However, since the debt equity ratios of the power company's listed at the stock exchanges were lower than that of the project activity, any adjustment on account of change in debt equity ratio will result in a higher equity beta value (2.13) which in turn will result in higher benchmark (24.11%), DNV has accepted the use of average raw equity beta value instead of adjusted equity beta values.</p> <p>Based on Capital Asset Pricing Model expected cost of equity works out to be 16.84%. The expected cost of equity calculation has been verified by DNV and was found to be correct.</p> <p>OK Accepted CL 1 is Closed.</p>
CL 2 PP is requested to justify why working capital is not added back in last year of operation in financial analysis sheet.	B.5.18	The working capital has been added back in the last year of operation under the cash flow statement. (see cell "Z22" of "cash flow" worksheet of investment analysis spreadsheet)	<p>Working capital has now been added back in last year cash inflow.</p> <p>Revised Investment analysis spreadsheet has been reviewed by DNV.</p> <p>OK Accepted. CL 2 is closed.</p>
CL 3 PP is requested to clarify the difference in value	B.5.20 B.5.21	The PLF of 21.12% was provided by the supplier which was used in the DPR for	The plant load factor provided in the detailed project report is 21.12%, which

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p>of PLF provided in the DPR (21.12%) and value used in the investment analysis (21.40%).</p> <p>Since the PPA for the project activity is not signed yet, PP is requested to demonstrate through electricity tariff availed by other power proponent in recent past that the electricity tariff considered is reasonable.</p> <p>Since the DPR for the project activity is not prepared by independent third party, PP is requested to compare the input values used in investment analysis with other wind power project</p>	<p>B.5.22 B.5.23 B.5.24 B.5.26 B.5.27 B.5.28 B.5.48</p>	<p>evaluation of the project. The feasibility study on PLF was also conducted by Centre for Wind Energy Technology (Independent third party) has provided the estimate of 21.40% at the selected project site. Further EB 48, annex 11 also states that PLF estimated by the third party shall be used for substantiating additionality. Therefore conservatively PLF of 21.40% is selected for substantiating additionality.</p> <p>During the time of investment decision the PP has considered the tariff of INR 4.28 per unit in accordance with RERC order dated 16 July 2009 that was available at the time of decision making. The tariff order is applicable for lifetime of the project activity. The tariff order dated 16 July 2009 was applicable to the projects that were commissioned before 31 March 2010.</p> <p>The power purchase agreement is now signed and as per PPA, the applicable tariff rate for the project activity is only 4.22 INR/kWh and is fixed for 20 years without any escalation, which is lower than tariff considered in investment analysis is conservative.</p> <p>The inputs parameters on cost such as capital cost, O&M cost and insurance cost considered in the DPR have been compared</p>	<p>was based on the electricity generation guarantee provided in budgetary offer received from Enercon (India) Limited dated 20 November 2009.</p> <p>However the investment analysis is conducted based on the plant load factor of 21.40% as provided in independent third party electricity generation estimation report, prepared by Centre for Wind Energy Technology (an autonomous research and development institution under Ministry of New and Renewable Energy) dated 20 January 2010. This is in line with Para 3 (b) of UNFCCC guidelines for the reporting and validation of plant load factors version 01 “plant load factor determined by a third party (engineering company) contracted by the project participants”.</p> <p>DNV has accepted the application of gross plant load factor of 21.40%% as provided in independent third party (generation estimate) report as:</p> <p>a) Application of this value for investment analysis is more conservative as the electricity generation guarantee provided in the supply offer is only 21.12%.</p> <p>b) This is based on the PLF (generation estimate) provided by independent third party.</p> <p>DNV has cross checked that the PLF value used in investment analysis sheet is consistent with the value provided by the</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p>commissioned in the region in recent past to justify the reasonableness of the input values used in investment analysis.</p> <p>PP is requested to provide copies of the PPA and O&M contract awarded for the project activity for verification.</p> <p>PP is requested to provide copy of supporting document for the insurance charges for verification.</p> <p>PP is requested to clarify the mismatch in the loan re-payment period, 12 years stated in the loan sanction letter of IDFC and 10 years considered in the DPR and financial analysis.</p>		<p>with other wind power projects that are registered in the state of Rajasthan. The comparison in form of spreadsheet has been submitted to the DOE for verification.</p> <p>The PPA agreement has now been signed copy of the same has been submitted to DoE for verification.</p> <p>O&M contract will be signed during the once all the WECs of the project activity are commissioned. The comparison of O&M cost considered in the DPR has been compared with other wind power projects that are registered in the state of Rajasthan. The comparison in form of spreadsheet has been submitted to the DOE for verification.</p> <p>The insurance charges are based on quotation dated 27 Oct 2009 provided by the insurance provider.</p> <p>The loan repayment period was assumed as 10 years for the project activity. The loan repayment period of 10 years is accepted norm for power sector projects and is envisaged by Central Electricity regulatory commission and State Electricity Regulatory commission. However, in actual the PP was able to secure loan from IDFC for period of 12 years. To capture the deviation, the PP has included the</p>	<p>independent third party report.</p> <p>The electricity tariff considered in detailed project report was based on the RERC order for “determinations of tariff for sale of electricity from wind power plants in the state to distribution licensees” dated 16 July 2009.</p> <p>DNV has cross-checked the electricity tariff applicable for the project activity against the power purchase agreements signed for the project activity and recent sales invoices raised to state electricity board and found that:</p> <p>The actual electricity tariff applicable to project activity is only 4.22 INR/kWh and is fixed for 20 years without any escalation. Hence use of electricity tariff of 4.28 INR/kWh for investment analysis is conservative.</p> <p>DNV has also verified from the recent sales invoice raised to Discoms that VAT is not applicable for sale of electricity and no tax has been included in the invoices.</p> <p>Project proponent has submitted a detailed comparison sheet including project cost, O & M costs, escalation in O & M costs, insurance costs, and electricity tariff has been submitted by project proponent and the details of other projects were also found to be in same range.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p>PP is also requested to clarify why the generation based subsidy of 0.50INR/kWh is not considered in the financial analysis.</p> <p>PP is requested to perform sensitivity analysis for all parameters till they touch the benchmark and the likelihood of that being achieved need to be indicated.</p>		<p>sensitivity analysis at loan tenure of 12 years in the PDD.</p> <p>As per order on generation based incentive, the PP can get incentive of INR 0.50 per kWh which is capped to the extent of 6.2 Million per MW and maximum of 1.55 Million per MW each year. Further, generation based incentive does not allow for accelerated depreciation of 80% in case of which normal depreciation of 15% will apply. GBI is included in investment analysis in the revised spreadsheet.</p> <p>The sensitivity analysis is extended to the point at which the equity IRR crosses the benchmark cost of equity. The justification of the reasonable variation that can be expected is also included in the PDD. The project is expected to yield return of 7.88% without CDM which improves to 19.13% after the addition of returns from CDM revenues.</p>	<p>Power purchase agreement signed on 17 June 2011 has been verified by DNV.</p> <p>O & M contract for the project activity has not been signed yet; however DNV has compared the O & M cost considered for the project activity with other projects and value were found to be in same range. Even with no O&M costs the equity IRR for the project activity is 11.2%, which is lower than the benchmark return. Hence this parameter is not sensitive for the project activity.</p> <p>The insurance cost considered is detailed project report was considered based on the insurance quotation received from United India Insurance Company Limited dated 27 October 2009. Copy of same has been verified by DNV.</p> <p>The loan tenure considered in detailed project report was based on the RERC order on “determination of tariff for sale of electricity from winds power plants in the state to distribution licensees” dated 16 July 2009. However the actual loan tenure was found to be 12 years and has been verified by DNV from the loan agreement signed with IDFC dated 30 April 2010. Even after considering the actual loan tenure, the equity IRR for the project works out to be 7.71% which is below than the benchmark. Hence this parameter is not sensitive for the</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			<p>project activity.</p> <p>Ministry of new and renewable energy sources, government of India offers two types of incentives for wind power projects, project activity can claim any one out of these two:</p> <p>a) 80% accelerated depreciation under the Income Tax Act.</p> <p>b) Generation based incentives (GBI) of 0.5 INR/kWh with cap of 6.2 Million INR/MW of installed capacity. This 6.2 Million INR/MW can be claimed in a period not less than 4 years and a maximum period of 10 years.</p> <p>The project activity has applied for generation based incentives and it has been verified by DNV that project proponent can avail only under one scheme as project proponent have to intimate first to Ministry about the option opted and ministry have procedure in place to track that project can avail benefit under one scheme only.</p> <p>A sensitivity analysis has now 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, electricity tariff, debt equity ratio and loan tenure were checked by calculating the variation necessary to reach the benchmark and then</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			<p>discussing the likelihood for that to happen.</p> <p>Decrease in capital cost: the total project cost considered in detailed project report was based on the budgetary offer received from Enercon (India) Limited dated 20 November 2009. However the total project cost for the project activity was verified to be only 2 772 million INR and has been verified by DNV from the actual purchase order placed to Enercon India Limited dated 5 December 2009. Even after considering the actual project cost, the equity IRR for the project works out to be 9.77% which is still below than the benchmark. With a decrease in project cost by 27.24% (from the cost considered in DPR, available at the time of investment decision) the equity IRR becomes 16.85% thus exceeds the benchmark. However in DNV's opinion a decrease of 27.24% in project cost is unrealistic as the project activity is already commissioned; hence any decrease in project cost is not realistic.</p> <p>Increase in electricity tariff: The electricity tariff of 4.28 INR/kWh considered in detailed project report was based on the RERC order for "determination of tariff for sale of electricity from winds power plants in the state to distribution licensees" dated 16 July 2009, applicable at the time of investment decision. As per the RERC order electricity tariff is fixed for 20 years,</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			<p>without any escalation (VAT is not applicable for sale of electricity as can be verified from recent sales invoice raised to state electricity board that no tax has been included in the invoice). With an increase of 40.66% (at electricity tariff of 6.02 INR/kWh) in electricity tariff the equity IRR becomes 16.89% thus exceeds the benchmark. However in DNV's opinion an increase of 40.66% in electricity tariff is highly unlikely as DNV has verified from the actual power purchase agreements signed for the project activity and recent sales invoices raised to state Discoms that that the actual electricity tariff for the project activity is only 4.22 INR/kWh without escalation and is fixed for 20 years without any escalation. Hence the use of electricity tariff of 4.28 INR/kWh in investment analysis for the investment analysis is already on a conservative side. Hence this parameter is not considered sensitive for the project activity.</p> <p>Increase in plant load factor: With an increase of 39.45% in plant load factor (at 29.84% PLF) the equity IRR becomes 16.86% and thus exceeds the benchmark. The PLF of 21.40% considered in the financial analysis is based on the independent third party electricity generation estimation report, prepared by Centre for Wind Energy Technology (an</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			<p>autonomous research and development institution under Ministry of New and Renewable Energy) dated 20 January 2010 for Enercon (India) Limited make WEC's (E-53, 800 kW).</p> <p>Enercon (India) Limited, supplier of WECs has only provided the generation guarantee based on the 21.12% PLF in its budgetary offer dated 20 November 2009. Moreover the Rajasthan Electricity Regulatory Commission (RERC) has considered only a PLF of 21% for district of Jaisalmer in its final tariff order dated 16 July 2009 for the purposes of tariff working. Hence an increase of 39.45% in electricity generation to achieve a 29.84% PLF for Jaisalmer is highly unlikely.</p> <p>Decrease in O&M cost: Even with no O&M costs the equity IRR for the project activity is 11.2%, which is lower than the benchmark return. Hence this parameter is not sensitive for the project activity.</p> <p>Increase in debt equity Ratio: the debt equity ratio of 70:30 considered in detailed project report was based on the RERC order on "order for "determination of tariff for sale of electricity from winds power plants in the State to Distribution Licensees" dated 16 July 2009. Even after considering the scenario of project activity could have been financed 100% from equity (7.62%) the equity IRR from the project activity is below benchmark. Hence this parameter is</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			<p>not sensitive for the project activity.</p> <p>Loan tenure: The loan tenure considered in detailed project report was based on the RERC order on “determination of tariff for sale of electricity from winds power plants in the state to distribution licensees” dated 16 July 2009. However the actual loan tenure was found to be 12 years and has been verified by DNV from the loan agreement signed with IDFC dated 30 April 2010. Even after considering the actual loan tenure, the equity IRR for the project works out to be 7.71% which is below than the benchmark. Hence this parameter is not sensitive for the project activity.</p> <p>OK Accepted.</p> <p>CL 3 is closed.</p>
<p>CL 4</p> <p>PP is requested to justify how the current monitoring arrangement defined in the PDD meets the requirement of the applied version of methodology, which requires Quantity of net electricity generation supplied by the project plant/unit to the grid in year need to be monitored, whereas the current arrangement mentioned in the PDD calculates net electricity based on the apportioning of electricity recorded by the common meter (meter to which machines of other investors are also connected).</p> <p>PP is also requested to explain the detailed procedures of apportioning in Annex 4 of the</p>	<p>B.7.1 B.7.2 B.7.3 B.7.4 B.7.5 B.7.6 B.7.7 B.7.8</p>	<p>The allocation plan is described in section B.7.2 of the PDD and reference for same is made in Annex 4 of the PDD. The main meter readings at the utility substation reflect the aggregate electricity supplied by all wind farms connected to the substation, including the project activity. The net electricity supplied by individual wind turbines is determined by a process of allocating the total electricity (recorded at the main meter(s)) to the individual turbines in proportion of the electricity generation recorded by the LCS meters at the individual wind turbines.</p>	<p>The applied version of the methodology requires net electricity exported to the grid to be monitored. In the current monitoring arrangement proposed by the project proponent the net electricity generated will be calculated from the readings of export and import indicated by the one set of Discom meter (main and check meter) at substation and individual WECs export readings recorded at central monitoring station. The meter reading at Discom (main and check meter) metering point will be taken jointly by the representatives of Enercon and distribution companies (Discom) in the form of Joint Meter</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
PDD.		The apportioning of the net electricity supplied to the grid is done based on the LCS meter reading and the reading of the main meter located at the substation. All the readings are that are used for apportioning are directly monitored and hence the monitoring plan is in line with the monitoring procedure described in ACM002	Reading. Since the net electricity will be calculated based on the apportioning of the metered values by Enercon India limited, this meets the requirement of the applied methodology. The detailed procedure of the apportioning is explained in section B.7.2 of the PDD and monitoring arrangement and detailed QA/QC procedures are also explained in annex-4 of the revised PDD. OK Accepted. CL 4 is closed.
<p>CL 5</p> <p>PP is requested to justify the delay of 4 months in notified the DNA of India of the intention to seek CDM status for the project activity, when the purchase order was placed on 5 December 2009 and CDM revenue was the decisive factor to go ahead with the project activity.</p> <p>PP is also requested to include the chronology of events in PDD.</p>	B.5.5	<p>In the initial month of the project activity the geo coordinates of the WECs were not confirmed and as per EB CDM prior consideration form, the geo co-ordinates of the project activity is required during intimating UNFCCC.</p> <p>As per the guidance of prior consideration of CDM, the PP shall send the notification to UNFCCC and DNA within 6 months from the date of start of the project. PP has intimated DNA and UNFCCC within stipulated timeframe provided under the guidance for prior consideration of CDM.</p> <p>b) Chronology of events has been incorporated under section B.5 in the PDD.</p> <p>c) The minutes of meeting has been provided to DoE for verification to demonstrate that CDM revenue was the decisive factor to go ahead with the project</p>	<p>It has been verified by DNV from the communication between project and Enercon (India) Limited that at the initial stage after placement of purchase order the final geo-coordinates of the WECs were not confirmed and it is requirement of CDM EB CDM prior consideration form, the geo co-ordinates of the project activity need to be intimated to UNFCCC while applying for the prior consideration.</p> <p>Detailed chronology of events has been included in revised version 03 of the PDD. Revised PDD has been verified by DNV.</p> <p>DNV has also evidenced the CDM consideration from the board approval dated 28 November 2009 for the project activity /5/, which is before the starting date of the project activity which clearly states</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		activity.	<p>that “Board members opined that the project would not be financially viable on a standalone basis only through sale of electricity. The director informed the board the financial risk posed to the project could be mitigated through the Clean Development Mechanism of UNFCCC, which provides additional revenue stream to clean energy projects through the sale of certified emission reductions and the project could still be viable investment if the benefits of CDM can be secured. The board concluded that steps should be taken at the earliest to ensure CDM registration of project”. CDM was therefore found to be seriously considered in the decision to proceed with the project activity.</p> <p>OK Accepted. CL 5 is closed.</p>

Table 4 Forward action requests

Forward action request	Reference to Table 2	Response by project participants
FAR 1 Not Applicable		

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APPENDIX B

CURRICULA VITAE OF THE VALIDATION TEAM MEMBERS

Murali Govindarajulu

Holds a Bachelor's Degree in Chemical Engineering and has done a Short term diploma course in Management. Having an overall experience of around eleven years. Prior to joining DNV having around seven years experience in Chemical process industry covering production, energy efficiency improvement and equipment design erection and commissioning. His experience also covers the fields of environmental management and resource conservation including identification of alternative fuels. He has also been actively involved in implementation of Management Systems such as ISO 140001 and OHSAS 18001 standards in chemical process industry for more than three years.

He has experience of around 4 years in validation and verification of numerous CDM projects in DNV, both in India & abroad. His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in energy generation from renewable energy sources.

Gaurav Srivastava

Gaurav Srivastava, CDM Validator/Verifier, DNV Bangalore, India holds a Master's Degree in Energy Systems. His educational qualification covers the fields of sustainable development, power plant technology, renewable energy technology, performance of thermal & electrical utilities and project financing. He has completed ISO 14001:2004 -Environmental Management System Auditor / Lead Auditor Program, certified by IRCA.

He has received extensive training in the CDM validation and verification process and has performed validation & verification of several CDM projects both India & abroad.

He has experience of around 3 and half years in validation and verification of numerous CDM projects in DNV, both in India & abroad. His qualification, training and experience in CDM demonstrate his sufficient sectoral competence in energy generation from renewable energy sources.

Ravi Kumar Prabhu

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

He has over two years experience in validation and verification of CDM projects in DNV and is also an EMS lead auditor.

His qualification, industrial experience and experience in CDM projects demonstrate sufficient sectoral competence in Chemical Process Industries, Thermal Energy Generation from fossil fuels, Heat distribution and Waste handling and disposal.

Kannan Parthasarathy

Handled various projects on Wind Turbine requirements since 1993 onwards as on date in DNV. This includes the following:

- Wind Turbine Generator - various inspection and projects Covering WEG capacity 250KW to 1.5MW and various manufacturer (Various services provided to different manufacturer - Vestas RRB/AWT/NEG Micon/Vestas/Poioneer Wincon/Poioneer Asia/Gamesa/Suzlan/GE/Siva Electric/Wind Win etc)
- Vendor inspection of various items and component assessments. Castings Hub & Extender/ Tower/ Nacelle/ Gear box/Generator/Forging-Shaft/Yawing system etc
- safety Testing of Over speed machine and Breaking system
- Installation Commissioning of Machines and Power curve at specific site studies. Analysis of Plant Load factor (PLF) - actual Vs plant capacity
- Design services and Co-ordination with DNV Principle Denmark Office.
- CWET Centre for Wind Energy Testing - providing technical support in establishing the system & procedures. Also Wind Monitoring Mast installation and assessments at CWET Testing Location.
- Wind Turbine Array arrangement and studies; Conducted Micro-siting studies (Wind) and arrive at power curve (Theoretical) requirements.
- Type testing of 1 MW Gear Box and Generator and manufacturing assessments.
- Management System Certificate audits (Experience of above also performed during the work at NEPC-Micon)

Nitin Kapoor

Nitin Kapoor holds a Bachelor in Chemical Engineering from BITS-Pilani and is also a qualified Chartered Financial Analyst (CFA) He has an overall experience of 15 years and 4 months as on date (October 2010). Prior to joining DNV he had experience of 10 years and 5 months in Oil & Gas as well as manufacturing sector (food) with leading MNC's like ITC, Coca Cola and Enron Oil and Gas. During his stint in industry part his responsibilities included carrying out energy audits and to identify potential areas of improvement. His experience includes analysis of specific consumptions (primarily on energy, raw materials and utilities) of processes based on historical data, carrying out material balances (heat and mass), analysis of equipment performance and identification and measurement of energy saving opportunities. He has also been responsible for the operations of the complete Crude Distillation Unit in the refinery, complete platform operations in Oil and Gas sector as well as for the utilities like steam, AHU while at ITC. He also has been responsible of the ETP operations in Coca Cola and ITC as well as Water and Sewage treatment plants while working

offshore. He has been responsible for EMS and QMS at ITC and Coca Cola. He has experience of around 3.5 years in validation and verification of numerous CDM projects within DNV. He is also a Lead Auditor for QMS, auditor for EMS and Safety. His qualification, industrial experience and project experience in CDM demonstrate his sufficient sectoral competence in Energy Generation from renewable energy sources, energy efficiency, heat distribution energy demand as well as waste handling and disposal. His direct work experience in Oil and Gas and food sector demonstrates his sectoral competence in these industries as well.

Agnes Dudek

Agnes Dudek holds a PhD Degree in applied physics. Having an overall experience of around 10.5 years. Prior to joining DNV having 7 years experience in scientific research covering satellite remote sensing, mesoscale weather forecast modelling and air pollution dispersion modelling and monitoring.

She has experience of around 3.5 years in validation and verification of numerous CDM projects.

Her qualification, research experience and experience in CDM demonstrate her sufficient sectoral competence in energy generation from renewable energy sources.