VALIDATION REPORT

27.3 MW WIND ENERGY FARM AT MOKLA RAJASTHAN BY HZL IN INDIA

REPORT NO.2012-9440

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DET NORSKE VERITAS

DET NORSKE VERITAS

VALIDATION REPORT

Date of first issue: 2012-03-15	ConCert Project No.: PRJC-340162-2011-CCS-IND
Approved by: Michael Lehmann	Organisational unit: DNV KEMA Energy & Sustainability Accredited Climate Change Services
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Summary:

Project Name: 27.3 MW Wind energy farm at Mokla Rajasthan by HZL
Country: India
Methodology: ACM0002 **Version:** 12.3.0
GHG reducing Measure/Technology: Grid connected wind power based renewable electricity generation
Sectoral Scope 1: Energy industries, renewable, TA 1.2
ER estimate: 44 627 tCO_2e per year (average)
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 "27.3 MW Wind energy farm at Mokla Rajasthan by HZL" in India, as described in the PDD, version 03 of 28 September 2012, meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology ACM0002, version 12.3.0. Hence DNV requests the registration of the project as a CDM project activity.

Report No.: 2012-9440	Subject Group: Environment
Report title: 27.3 MW Wind energy farm at Mokla Rajasthan by HZL in India	
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Clean Development Mechanism

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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
CMP	CDM Modalities and Practices
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
C-WET	Centre for Wind Energy Technology
DNV	DNV Climate Change Services AS
DNA	Designated National Authority
DOC	Date of Commissioning
FAR	Forward Action Request
GBI	Generation Based Incentive
GHG	Greenhouse gas(es)
HZL	Hindustan Zinc Limited
IPCC	Intergovernmental Panel on Climate Change
IREDA	Indian Renewable Energy Development Agency
LoA	Letter of approval
MAT	Minimum Alternate Tax
MNRE	Ministry of New and Renewable Energy
MoEF	Ministry of Environment and Forests
MoP	Ministry of Power
NCDMA	National Clean Development Mechanism Authority
NEWNE	North East West North-East integrated grid of India
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
PP	Project Participant
tCO_2e	Tonnes of CO_2 equivalents
UNFCCC	United Nations Framework Convention on Climate Change
WTG	Wind Turbine Generators

1 EXECUTIVE SUMMARY – VALIDATION OPINION

DNV Climate Change Services AS (DNV) has performed a validation of the project activity "27.3 MW Wind energy farm at Mokla Rajasthan by HZL" 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 host Party is India and the Annex I Party has not been identified yet. The host Party fulfils the participation criteria and has approved the project and authorized the project participants Hindustan Zinc Limited. The DNA from India confirmed that the project assists in achieving sustainable development.

The project correctly applies the baseline and monitoring methodology ACM0002, version 12.3.0 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources".

The project activity envisages generation of electricity from wind energy by installing 13 wind electricity converters (WEC), each of 2100 kW capacity, in the villages Sonu, Mokla, and Serawa in the district of Jaisalmer in the state of Rajasthan, India. The project activity is expected to generate 47 040.41 MWh of electric power per year, which will replace an equivalent amount of fossil fuel intensive power in the system grid. The total emission reductions from the project are estimated to be on the average 44 627 tCO_2e per year over the selected 7 years' first renewable 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. As a result, the project results in reductions of CO_2 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 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 participants are able to implement the monitoring plan.

In summary, it is DNV's opinion that the project activity "27.3 MW Wind energy farm at Mokla Rajasthan by HZL" in India, as described in the PDD, version 03 dated 28 September 2012, meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology ACM0002, version 12.3.0. Hence, DNV requests the registration of the project as a CDM project activity.

Bangalore and Oslo, 2012-10-17

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2 INTRODUCTION

Hindustan Zinc Limited has commissioned DNV Climate Change Services AS (DNV) to perform a validation of the "27.3 MW Wind energy farm at Mokla Rajasthan by HZL" project in India (hereafter called "the project"). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, the simplified modalities and procedures for small-scale CDM project activities 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 criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0002 (version 12.3.0) /29/. The validation was based on the recommendations in the Validation and Verification Manual /28/.

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/ HZL: *CDM-PDD for project activity "27.3 MW* Wind energy farm at Mokla Rajasthan by HZL*" in India*, Version 1 dated 19 December 2011 and version 03 dated 28 September 2012

/2/ HZL: Agreement dated 15 June 2011 between HZL and Suzlon Gujarat Windpark Limited for lease of land for project activity

/3/ HZL: Agreement dated 15 June 2011 between HZL and Suzlon Infrastructure Services Limited (SISL) for construction works related to project

/4/ HZL: Agreement dated 15 June 2011 between HZL and SISL for supply of electrical items.

/5/ HZL: Agreement dated 15 June 2011 between HZL and Suzlon Energy Limited, for supply of nacelle, generator, control cabinet, gear box etc.

/6/ HZL: Agreement dated 15 June 2011 between HZL and Suzlon Power Infrastructure Ltd for supply of power evacuation equipment.

/7/ HZL: Agreement dated 15 June 2011 between HZL and Suzlon energy Limited for supply of rotor blades.

/8/ HZL: Agreement dated 15 June 2011 between HZL and Suzlon Towers & Structures Limited for supply of tower etc.

/9/ HZL: Agreement dated 15 June 2011 between HZL and SISL for supply of transformer etc.

/10/ Hindustan Zinc Limited: Agreement dated 15 June 2011between HZL and SISL for unloading of equipment at site, erection and commissioning.

/11/ HZL: Agreement dated 15 June 2011between HZL and SISL for O&M services.

/12/ HZL: Power Purchase Agreement (PPA) dated 14 September 2011among HZL, SISL, and Ajmer Vidyut Vitran Nigam Limited for 27.3 (13 x 2.1) MW wind power plant.

/13/ Power & Energy Consultants: Wind resource assessment report initial and revised report ref no. PEC/WRA/HZL/03 dated 31 May 2012.

/14/ HZL: MS Excel sheet containing IRR analysis, version 1, dated 19 December 2011 and version 03 dated 19 July 2012

/15/ HZL: MS Excel sheet containing details of benchmark calculations, version 1, dated 30 November 2011, version 3 dated 19 July 2012

/16/ HZL: MS Excel sheet containing estimated CER, version 1, dated 19 December 2011, version 3 dated 19 July 2012

/17/ HZL: Approval for investment dated 10 December 2010 (capacity: 27 MW, investment: INR 1620 Million) and approval dated 6 June 2011 for shifting of project site to Mokla, Jaisalmer District, Rajasthan (capacity: 27.3 MW, investment: INR 1440.54 Million)

/18/ Suzlon Energy Limited: Techno-commercial offer dated 4 December 2010 for supply of equipment for proposed HZL wind power projects at various sites including for Mokla site, terms of O&M Services along with details of specifications of S-88 model of 2100 kW capacity (Technical Sheet)

/19/ HZL: MAT eligibility Certificate dated 26 September 2011 issued by Mahendra Pokhrana & Co, Chartered Accountants

/20/ HZL: Local Stakeholder Consultation Meeting records consisting of notice dated 22

August 2011 regarding meeting scheduled on 7 September 2011, attendance sheet and minutes of meeting dated 7 September 2011

/21/ HZL: Commissioning certificates dated 11 October 2011, 1 November 2011, 23 November 2011 and 20 December 2011, issued by the Superintending Engineer, Ajmer DISCOM, Jaipur, confirming successful commissioning of 3 x 2.1 MW, 4 x 2.1 MW, 2 x 2.1 MW, and 4 x 2.1 MW WTGs respectively

/22/ HZL: Copy of e-mail dated 18 July 2011 to the UNFCCC Secretariat confirming desire to seek CDM status for the proposed project and copy of email dated 10 August 2011 from CDM Registration and Issuance confirming receipt of project information notification.

/23/ HZL: Copy of e-mail dated 18 July 2011 from Mr. Ahuja, HZL, addressed to the NCDMA, India, confirming desire to seek CDM status for the proposed project and and copy of email dated 19 July 2011 from NCDMA confirming receipt of project information notification.

/24/ HZL: Certificate from Nyati Mundra & Co, dated 30 June 2012 affirming project cost and source of funds.

/25/ HZL: Policy Schedule from The Oriental Insurance Company Limited for the period 17 August 2010 to 16 August 20011 for mines, smelters, power plants of HZL including for wind power plants with premium rate of 1.15% of the value of fixed assets

/26/ HZL: Copy of sample invoice no. HZL/08 dated 16 April 2012 indicating compensation for transmission loss at 4%

3.1.2 Letters of approval

/27/ National CDM Authority, Ministry of Environment and Forests (DNA of India): Letter of approval no. 4/16/2012 dated 14 September 2012 for the project activity.

3.1.3 Methodologies, tools and other guidance bythe CDM Executive Board

/28/ CDM Executive Board: *Validation and Verification Manual*, version 1.2

/29/ CDM Executive Board: *Baseline and monitoring methodology "Approved consolidated baseline and monitoring methodology"ACM0002*, version 12.3.0

/30/ CDM Executive Board: *Tool to calculate the emission factor for an electricity system*, Version 2.2.1

/31/ CDM Executive Board: *Tool for the demonstration and assessment of additionality*, Version 6.0.0

/32/ CDM Executive Board: *Guidelines on the demonstration and assessment of prior consideration of the CDM*, version 04, EB 62, Annex 13

/33/ CDM Executive Board: *Guidelines on the assessment of investment analysis*, Version 05, EB 62, Annex 5

/34/ CDM Executive Board: *Guidelines for completing the Project Design Document(CDM-PDD)*, version 07

/35/ CDM Executive Board: *Guidelines for reporting and validation of Plant Load Factors*, version 01, EB 48, Annex 11

/36/ CDM Executive Board: Glossary of CDM terms, version 06,EB 66, Annex 63

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

/37/ CDM Project Ref 5531: "1.5 MW wind power project of Nirmal B. Thakkar H.U.F. at Rajasthan, India"
http://cdm.unfccc.int/Projects/DB/RWTUV1323884669.47/view

/38/ CDM Project Ref 5439: "Wind power project in Jaisalmer, Rajasthan by Centaur Mercantile Pvt. Ltd"
http://cdm.unfccc.int/Projects/DB/RWTUV1323884669.47/view

/39/ CDM Project Ref 5923: "Wind Power Project in Rajasthan, India by M/s Devki Builders Pvt. Ltd" http://cdm.unfccc.int/Projects/DB/SIRIM1332321083.17/view

/40/ CDM Project Ref 5576: "7.5 MW wind power project at Jaisalmer, India", http://cdm.unfccc.int/Projects/DB/SGS-UKL1324292554.62/view

/41/ CDM Project Ref 5186: "Vaayu India Wind Power Project in Jaisalmer, Rajasthan" http://cdm.unfccc.int/Projects/DB/DNV-CUK1315481394.7/view

/42/ CEA: CO_2 Baseline Database for the Indian Power Sector. Version 6, Date: March 2011, http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm and user guide, version 6.0, dated March 2011 (Last accessed on 21August 2012)
http://www.cea.nic.in/reports/planning/cdm_co2/user_guide_ver6.pdf

/43/ MoEF: Requirement of Environment Impact Assessment (EIA) studies, dated 14 September 2006 and its amendments (Last accessed on 21August 2012)
http://envfor.nic.in/legis/env_clr.htm

/44/ Centre for Wind Energy Technology: Revised list of models and manufacturers of wind turbines, possessing valid approval, Ref. No. C-WET/S&C/RLMM/2010-11/06, dated 18 May 2010

/45/ MNRE: "Policies for development of renewable energy in India", Ministry of New & Renewable Energy, Government of India, (Last accessed on 21August 2012) http://www.indiaenergyportal.org/viewPolicies.php?id=PO1&theme=

/46/ Indian Wind Turbine Manufacturers Association: Directory of Indian Wind Power, 2010

/47/ CDM Executive Board: Confirmation of Prior consideration of CDM for this project available at registration of prior CDM consideration for this project activity on 18 July 2011 available at
http://cdm.unfccc.int/Projects/PriorCDM/notifications/index_html

/48/ CDM Executive Board: Web hosting of project for global stakeholder consultation from 23 December 2011
http://cdm.unfccc.int/Projects/Validation/DB/VGV3WHX2XVWSVB5Q8RE10ZG0BURZRL/view.html

/49/ C-WET: "India state wise installed capacity" available at (Last accessed on 21August 2012)
http://www.cwet.tn.nic.in/html/information_isw.html

/50/ IT department: Rates of depreciation as per IT act, III, 8G(XIII)(l), (Last accessed on 21August 2012)
http://law.incometaxindia.gov.in/dittaxmann/incometaxacts/2008itact/sec_080-

ia.htm
Deduction under section 80-IA of Income Tax Act 1961 (Last accessed on 21August 2012)
http://www.caclubindia.com/articles/deduction-u-s-80-ia-of-income-tax-act-1961-4392.asp
Depreciation as per Companies Act, (Last accessed on 21August 2012) http://taxguru.in/company-law/rates-of-depreciation-under-the-companies-act-as-mentioned-in-schedule-xiv.html

/51/ Indian Electricity Act, 2003 and its amendments, (Last accessed on 21August 2012) http://www.powermin.nic.in/acts_notification/electricity_act2003/pdf/The%20Electricity%20Act_2003.pdf
Central Electricity Authority: Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006 and its amendments. 2012)http://www.powermin.nic.in/whats_new/pdf/Metering_Regulations.pdf

/52/ Google Maps: Project location at Sonu, Mokla, and Serawa in the district of Jaisalmer in the state of Rajasthan, India

/53/ Indian Wind Turbine Manufacturers Association: "Guidelines / Incentives for wind power generation in various states"(Last accessed on 21August 2012) - http://www.indianwindpower.com/policy_environment.php

/54/ Global Wind Energy Council: "Global Wind Report" Annual Market Update 2010 - available at (Last accessed on 21August 2012)
http://www.indianwindpower.com/pdf/gwecReport_2010.pdf

/55/ IREDA: "Assessment of investment climate for wind power development in India for Indian Renewable Energy Development Agency (IREDA)" (Last accessed on 21August 2012)
http://ireda.gov.in/pdf/Assessment.pdf

/56/ IREDA: "Compendium of state government policies on renewable energy sector in India" (Last accessed on 21August 2012)
http://ireda.gov.in/Compendium/index%20copy.htm

/57/ Ministry of New and Renewable Energy: "STRATEGIC PLAN FOR NEW AND RENEWABLE ENERGY SECTOR FOR THE PERIOD 2011-17"(Last accessed on 21August 2012)
http://mnre.gov.in/file-manager/UserFiles/strategic_plan_mnre_2011_17.pdf

/58/ Rajasthan Electricity Regulatory Commission: RERC tariff order no. 15 dated 14 Dec 2011, order no.11 dated 3 June 2011, and tariff orders dated 31 March 2010 and tariff order dated 16 July 2009

/59/ Suzlon Energy Limited: Technical Overview – S-88/2.1 MW available at (Last accessed on 21August 2012)
http://www.suzlon.com/pdf/S88%20product%20brochure.pdf

/60/ Stock information available on (Last accessed on 21August 2012)
http://m.moneycontrol.com/
BF Utilities http://www.moneycontrol.com/india/financials/bfutilities/profit-loss/BFU
Tata Power
http://www.moneycontrol.com/india/financials/tatapowercompany/profit-loss/TPC

Neyveli Lignite
http://www.moneycontrol.com/india/financials/neyvelilignitecorporation/profit-loss/NLC
GIPCL
http://www.moneycontrol.com/india/financials/gujaratindustriespowerco/profit-loss/GIP
CESC http://www.moneycontrol.com/india/financials/cesc/profit-loss/CES
Reliance Infra
http://www.moneycontrol.com/india/financials/relianceinfrastructure/profit-loss/RI38
NTPC http://www.moneycontrol.com/india/financials/ntpc/profit-loss/NTP
Jai Prakash Power Ventures
http://www.moneycontrol.com/india/financials/jaiprakashpowerventures/profit-loss/JHP01
GVK Power & Infrastructure
http://www.moneycontrol.com/india/financials/gvkpowerinfrastructure/profit-loss/GVK

/61/ TaxGuru Complete tax solutions - Tax rates applicable for A.Y. 2011-2012 http://taxguru.in/income-tax/tax-rate-applicable-for-a-y-2011-12-on-income-dividend-wealth-mat-stt-capital-gain-and-presumptive-income.html
(30% + 7.5% + 3% on sum) (18% + 7.5% + 3% on sum)

/62/ INVESTOPEDIA: Unlevered beta: http://www.investopedia.com/terms/u/unleveredbeta.asp#axzz21oDH2zVA

/63/ Directorate of Service Taxes: "Levy of Service tax" available at http://www.servicetax.gov.in/st-proc-home.htm being @10% plus 2% and 1% cess

/64/ "Corporate Finance: Theory and Practice" (Wiley Series in Finance) by Aswath Damodaran.
http://ebookee.org/-request_ebook-Corporate-Finance-Theory-and-Practice_344125.html

/65/ MoEF: Requirement of Environment Impact Assessment (EIA) studies, dated 14 September 2006, http://envfor.nic.in/legis/eia/so1533.pdf
Government gazette notification no. S.O. 3067 (E) dated 1 December 2009, http://moef.nic.in/downloads/rules-and-regulations/3067.pdf

/66/ RBI :Month-end Yield to Maturity of SGL Transactions in Central Government Dated Securities for Various Residual Maturities: May 2011 available at (Last accessed on 21August 2012)
http://rbidocs.rbi.org.in/rdocs/Bulletin/PDFs/26CT_CS100511.pdf

/67/ BSE SENSEX: Historical data Indices, BSE 100, BSE 200: http://beta.bseindia.com/indices/IndexArchiveData.aspx?expandable=3

/68/ CDM Project reference no. 1168- http://cdm.unfccc.int/Projects/DB/SGS-UKL1181742063.57/view
Project no. 3642 http://cdm.unfccc.int/Projects/DB/BVQI1270985563.08/view
Project no. 4679 - http://cdm.unfccc.int/Projects/DB/BVQI1302691944.71/view
Project no. 0310 - http://cdm.unfccc.int/Projects/DB/DNV-CUK1143050217.74/view

Project no. 3839 - http://cdm.unfccc.int/Projects/DB/LRQA%20Ltd1278588174.29/view
HPCL bundled Project web-hosting ref: http://cdm.unfccc.int/filestorage/3/V/M/3VMQRC5EO6G7AB028WZUPDJ1SK9Y4X/PDD%20HPCL.pdf?t=MmN8bTlycm5tfDBtLfg0-rSp767wmbxYHqCb
"STATE-WISE/YEAR-WISE LIST OF COMMISSINED BIOMASS POWER/COGENERATION PROJECTS (AS ON 31.03.2011)" available at http://mnre.gov.in/schemes/grid-connected/biomass-powercogen/
"Ocean Energy" available at http://www.eai.in/ref/ae/oce/oce.html
CDM Project search available at http://cdm.unfccc.int/Projects/projsearch.html

/69/ Texas Forest Service: Nominal Rate and Real rate calculator available at http://tfsfrd.tamu.edu/tdss/Basic/rates.htm

/70/ Reserve Bank of India: Survey of professional forecasters: Results of 14th round, dated 2 February 2011, available at http://rbi.org.in/scripts/PublicationsView.aspx?id=13050

/71/ IREDA: Guidelines - Generation based incentive for wind based power generation http://114.143.207.231/IREDA/upload/OPERATIONAL%20GUIDELINES%20for%20Wind%20GBI%20and%20AD%20as%20on%2026.05.2010.doc
Confirmation link for GBI registration of the project http://110.234.218.202/iredawindmill/form/ReportgbiScheme.aspx

3.2 Follow-up interviews with project stakeholders

On 1 February 2012 DNV visited the wind farm located at Habur, Sanu and Mokla in Jaisalmer district apart from having discussion at the office of HZL in Chittorgarh and performed interviews with project stakeholders.

	Date	Name	Organization	Topic
/72/	2012-02-01 & 2012-02-04	Bhagwan .L.Ahuja Aditya Bharadwaj Vishnu Khandelwal	AGM, CDM, HZL E&Y, Consultant Elec. Engineer, HZL	• Project baseline • Investment decision • CDM prior consideration. • Applicability criteria • Additionality issues
	2012-02-01	Aditya Bharadwaj Vishnu Khandelwal Tarun Kumar Lokesh Kumar Satish Kumar Abhiskhek Mathur Alwar Singh Manoj Chaudhary Satish Sharma	E&Y, Consultant Elec. Engineer, HZL Engineer-OMS, Section-in-charge Junior Enigineer Engineer-OMS Section-in-charge, OMS Engineer (OMS) Senior Engineer	• Project design, IRR analysis, • Monitoring and verification procedure • Quality systems and procedures • Review of the stakeholder consultation process. • Common practice

			(OMS)	analysis • Documentation review

The PDD /1/ submitted for global stakeholder consultation was revised (version no. 3 dated 28 September2012) to address various issues raised during validation and salient changes are as below:

- The Plant Load factor (PLF) was revised from 19.46 to 19.67%.
- The estimated CERs have been corrected after recalculation of estimated net power exported to grid and the grid emission factor.
- The post-tax return on equity has been revised from 16.87% to 14% Monitoring plan has been revised to keep in line with site conditions and calculation procedures of losses etc included.
- Change of start date of crediting period to 1 December 2012

3.3 Resolution of outstanding issues

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

- 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 "27.3 MW Wind energy farm at Mokla Rajasthan by HZL" in India is enclosed in Appendix A to this report.

Table 2 of the validation protocol documents the findings of the desk review of the project design documentation and follow-up interviews with project stakeholders. Any findings raised in Table 2 are listed in Table 3 of the protocol, and changes to the description of the project design as a result of these findings will be addressed in Table 3. Table 2 thus may not reflect all aspects of the project as described in the final PDD submitted for registration.

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***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**) or a **corrective action request (CAR)** if a requirement is not met.*

Validation Protocol Table 2: Requirement Checklist				
Checklist question	***Reference***	***Means of verification (MoV)***	***Assessment by DNV***	***Draft and/or Final Conclusion***
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	*Gives reference to documents where the answer to the checklist question or item is found.*	*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.*	*The discussion on how the conclusion is arrived at and the conclusion on the compliance with the checklist question so far.*	*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.*

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***
*The **CARs** and/ or **CLs** raised in Table 2 are repeated here.*	*Reference to the checklist question number in Table 2 where the CAR or CL is explained.*	*The responses given by the project participants to address the CARs and/or CLs.*	*The validation team's assessment and final conclusions of the CARs and/or CLs.*

Validation Protocol Table 4: Forward Action Requests		
Forward action request	***Ref. to checklist question in table 2***	***Response by project participants***
The FARs raised in Table 2 are repeated here.	*Reference to the checklist question number in Table 2 where the FAR is explained.*	*Response by project participants on how forward action request will be addressed prior to first verification.*

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

				Type of involvement						
Role	***Last Name***	***First Name***	***Country***	Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	TA 1.2 competence	Financial expertise
Team leader (Validator)	Ranganathan	Seshan	India	✓	✓	✓	✓		✓	
Assessor under training	Sudarshan	Komaranapura Venkatachar	India	✓	✓	✓				
Expert	Srinivasan	M V	India	✓		✓				✓
Technical reviewer	Govindarajulu	Murali	India					✓	✓	

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 28 September 2012.

4.1 Participation requirements

The project participant is Hindustan Zinc Limited of host Party of India. The host Party (India) meets all relevant participation requirements.

A letter of approval (LoA) /27/ was issued by DNA of India on 14 September 2012, authorizing Hindustan Zinc Limited as project participant and confirming that the project assists in achieving sustainable development.

The letter of approval was received from the project participants. DNV does not doubt the authenticity of the letters of approval. DNV considers the letters are in accordance with paragraphs 45- 48 of the VVM /28/.

The project is owned by Hindustan Zinc Limited /21/ 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 /24/.

4.2 Project design

The project envisages installation of 13 * 2100 kW wind turbines, all of them located in three villages, namely Sonu, Mokla, and Serawa, in the district of Jaisalmer in the State of Rajasthan in India. It is confirmed during site visit /72/ and from the commissioning certificates /21/ that the project turbines were commissioned as per details in the following table:

WTG Nos. Ref	Date of Commissioning	Commissioning Certificate Reference
SKD 186, MK 178, MK 31	29 September 2011	No. 985 dated 11 October 2011
MK 179, MK 215, MK 180, MK 181	22 October 2011	No. 1081 dated 1 November 2011
MK 216, MK 217	19 November 2011	No. 1182 dated 23 November 2011
MK 29, MK 44	2 December 2011	No. 1234 dated 20 December 2011
MK 216, MK 217	10 December 2011	No. 1233 dated 20 December 2011

The geographic co-ordinates /72//52/of each WTG is as below.

Sr. No.	WTG. No.	Latitude (N)				Longitude (E)			
		Deg	Min	Sec	Decimal	Deg	Min	Sec	Decimal

1	MK221	27	15	9.6	27.25266667	70	39	49.8	70.6638333
2	MK44	27	10	46.2	27.17950000	70	40	2.3	70.6673056
3	MK29	27	7	46.5	27.12958333	70	46	38.1	70.7772500
4	MK23	27	8	29.6	27.14155556	70	44	3.6	70.7343333
5	MK216	27	14	36.9	27.24358333	70	41	12.8	70.6868889
6	MK217	27	14	43.6	27.24544444	70	40	55.1	70.6819722
7	MK31	27	8	27.5	27.14097222	70	45	52.8	70.7646667
8	SKD186	27	12	32.1	27.20891667	70	37	3.6	70.6176667
9	MK178	27	14	14.6	27.23738889	70	40	29.1	70.6747500
10	MK179	27	14	8.7	27.23575000	70	40	49.1	70.6803056
11	MK180	27	14	2	27.23388889	70	41	6.7	70.6851944
12	MK181	27	13	55.4	27.23205556	70	41	24.5	70.6901389
13	MK215	27	14	30.3	27.24175000	70	41	30.4	70.6917778

The (13) WTGs are of SUZLON S-88 type, with rated capacity of 2100 kW (total project capacity: 13 * 2.1 MW), rotors with pitch control, generators of induction type, with tubular steel structure was confirmed by a review of the copy of the purchase orders placed /4//5//7//8/ and physical verification during site visit /72/.

The date of purchase orders for equipment, erection, and commissioning /4//5//7//8//6//10//9/ as well as the date of order for civil construction of foundation and support for the equipment /3/ is verified to be 15 June 2011, the date on which first financial commitment was made for project implementation and has been correctly regarded as the start date of the project in line with the definition /36/.

The useful life of the project is expected to be 20 years, which is as per the details submitted by the supplier /18/ and is in line with the general specifications of such installations /37/ to /41/ in the host country.

The PP has opted for renewable crediting period of seven years with the possible start date of crediting period indicated as 1 December 2012, or the date of registration, which is in line with the CDM requirements.

The installation, commissioning, operation, monitoring and maintenance of the WTG's are covered by the O&M Contract /11/ entered into by the PP with Suzlon Infrastructure Services Limited for the entire life (20 years) of the project. The technology used in the project activity is indigenously available in India and no transfer of technology is envisaged.

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 /34/.

4.3 Application of selected baseline and monitoring methodology

The project applies the approved baseline methodology ACM0002, version 12.3.0, "Consolidated baseline methodology for grid-connected electricity generation from renewable

sources" /29/. The project applies the prescribed applicable tools, "Tool for the demonstration and assessment of additionality", (Version 06.0.0), and "Tool to calculate the emission factor for an electricity system" (Version 02.2.1) /30/.

The justification of the applicability of the methodology to this project activity is as per following details:

- The project activity proposes to exploit the wind power potential, a renewable source, to generate electric power which is evacuated into the NEWNE grid /12/
- The project activity does not involve capacity additions, retrofit or replacement. The agreement for land lease /2/, copy of order for civil construction /3/, and copies of purchase orders for supply, erection and commissioning of 2100 kW capacity WTGs /4/ - /10/ have been verified to confirm that this is a greenfield project activity; this was further confirmed during site visit and interviews with the site personnel /72/, and the respective commissioning certificates /21/.
- Power is proposed to be generated by undertaking new installation of wind electricity generators at a site where no renewable energy power plant was operated prior to the implementation of the project activity. This has been verified during the site visit /72/ and from the purchase orders for WTGs /4/ - /10/ and the commissioning certificates /21/.
- No retrofit or capacity additions or replacements at the existing plants are involved. This has been verified during the site visit /72/.
- The project activity is connected to the NEWNE grid /12/; the system boundaries are clearly identified and information on the characteristics of this grid is available /42/.
- This is a wind power project, and does not involve power generation based on hydro potential or by biomass utilization.
- The project does not involve any kind of fuel switch as this is a wind power project.

It is further confirmed that the project activity complies with all the applicability conditions of the applied tools, namely, "Tool for the demonstration and assessment of additionality", and "Tool to calculate the emission factor for an electricity system".

The generated electricity substitutes electricity generation in the fossil fuel dominated NEWNE grid /12/ /42/.

The assessment of the project's compliance with the applicability criteria of ACM0002 (version 12.3.0) 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 project system boundary consists of all the 13 wind energy turbines, the transformer yards, transmission lines, pooling sub-stations, the connected NEWNE grid system and all the power plants connected to it.

Details of emission sources included in the project boundary are as follows:

Source	GHG Involved	Description
Baseline emissions	Carbon dioxide	CO_2 emissions equivalent to the amount of net electricity exported to the grid by the project activity that would have otherwise been generated by the

		other power plants connected to the grid
Project emissions	Not Applicable	Not Applicable
Leakage	Not Applicable	Not Applicable

The identified boundary and selected sources and gases are justified for the project activity. The validation of the project activity did not reveal 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 12.3.0).

4.5 Baseline identification

As the proposed project activity consists of installing a new grid connected renewable power plant comprising of wind energy turbines and the project is additional, cf. Section 4.6, the baseline scenario is in accordance with ACM0002, version 12.3.0 /29/, which is as follows:

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", version 2.2.1 /30/.

The approved baseline methodology /29/ has been correctly applied to identify realistic and credible baseline scenario, 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 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.

4.6 Additionality

The additionality of the project activity has been demonstrated by applying the step-wise approach given in the "Tool for demonstration and assessment of additionality", version 6.0, /31/. Following steps have been included:

1. Identification of alternatives to the project activity
2. Investment analysis to determine that the project activity is not financially feasible, and,
3. Common practice analysis.

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

The Project Participant Hindustan Zinc Limited has CDM projects of total installed capacity of 123.2 MW duly registered and is aware of the CDM benefits.

The PP has placed the orders for supply of various components and the project equipment vide various purchase orders /4//5//6//7//8//9/ dated 15 June 2011; the documents evidencing the lease of land for the project activity and order for civil construction are also dated 15 June 2011.Thus, the earliest date on which either the implementation or construction or real action

of a project activity begins or the earliest date when the PP has committed to expenditure related to project implementation is 15 June 2011; accordingly, 15 June 2011 has been considered as the start date of the project activity which is in line with the definition of starting date /36/.

Since the start date of 15 June 2011 of the project activity is after 2 August 2008, the project proponent has notified the UNFCCC secretariat on their plans to implement a CDM project in Jaisalmer district of Rajasthan by an email dated 18 July 2011 /22/ and UNFCCC Secretariat acknowledged the same /22/. Further, DNV has confirmed the same from UNFCCC website /47/.

The PP has also intimated the National Clean Development Mechanism Authority (NCDMA), India, Ministry of Environment and Forests (MoEF) (host Party DNA), by email dated 18 July 2011 /23/, regarding the proposed project activity and NCDMA has duly acknowledged receipt by email dated 19 July 2011 /23/.

The start date of the project is 15 June 2011 and the intimations to UNFCCC and NCDMA (the host Party DNA) have been submitted on 18 July 2011, which is within six months from the start date of project activity. DNV has verified the copies of e-mails and also has confirmed that the project appears on the prior consideration link /47/.

Further, the validation of the project started with the publication of the PDD for global stakeholder consultation on 23 December 2011 /48/ which is within two years of the intimation to the DNA and UNFCCC thereby complies with the EB guidelines on prior consideration of CDM /32/ .DNV has also evidenced the CDM consideration from the approval of the investment proposal of HZL and therefore find CDM to be seriously considered in the decision to proceed with the project activity

Thus, it is demonstrated that the CDM was seriously considered in the decision to proceed with the project activity and all the prescribed actions have been fulfilled to register the same in a verifiable manner. Therefore, DNV confirms that the proposed CDM project activity complies with the requirements of the latest version of the guidance on prior consideration of CDM /32/.

4.6.2 Identification of alternatives to the project activity

The applied methodology ACM0002 version 12.3.0 /29/ specifies that, for the grid connected new renewable power plants, the baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of the grid connected power plants and by the addition of new generation sources, as reflected by the combined margin.

Two alternatives to the project activity have been considered. These are,

i) Implementation of the project activity without CDM benefits, and,

ii) Continuation of current scenario (status quo)

In the event of the second scenario, 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.

DNV considers the listed alternatives to be credible and complete.

4.6.3 Investment analysis

Choice of approach

The project proposes to export generated electricity to the grid, which generates revenues on account of sale of electricity, thus providing a stream of revenue other than of CDM. Thus, Simple Cost Analysis is not applicable.

The alternative of continuation of status quo, that is continuation of sourcing of power from the existing grid, does not involve any investment on the part of the project proponent. Thus, the alternative to the project does not involve any investment and hence investment comparison analysis is not applicable.

Thus, the selected benchmark analysis for demonstrating the additionality of the project activity is in line with the EB "Guidelines on the assessment of investment analysis" /33/, which is considered appropriate by DNV.

Benchmark selection

The project activity being a renewable energy project, it can be developed by any entity other than the project participant. Hence, as per paragraph 13 of the "Guidelines on the assessment of investment analysis" the benchmark should be based on parameters that are standard in the market. Thus, the PP's choice of post-tax expected / required return on equity as the benchmark, calculated on parameters that are standard in the market, is considered appropriate.

Further, as per paragraph 12 of the "Guidelines on the assessment of investment analysis" /33/, required/expected returns on equity are appropriate benchmarks for equity IRR. The PP has selected post-tax equity-IRR as the financial indicator for comparison against the required return on equity (post-tax).

In order to calculate the required return on equity the PP has used the Capital Asset Pricing Model (CAPM) by adopting the methodology widely accepted and enunciated in detail in the monograph titled "Corporate Finance: Theory and Practice" (Wiley Series in Finance) by Aswath Damodaran /64/.

The required return on equity is calculated by using the formula,

$R_e = R_f + \beta_s (R_m - R_f)$, where,
R_e, is the required return on equity,
β_s, is the Beta value of power generation companies in India
Rf, is the risk free rate of return, and
Rm, is the market return.

DNV has verified and confirmed that the benchmark has been computed based on the following:

1. The data used for benchmark working was available at and corresponds to the time of investment decision and coincides with the duration and period for which the financial analysis has been presented
2. The data used for benchmark working pertains to power generating companies (nearest similar business) listed in BSE, these data is accepted to be appropriate in the absence of reliable data of wind power generating companies, and
3. For arriving at the Beta values, care has been taken to include companies whose data from stock exchange is available at least for the previous five years /60/.

With particular reference to individual parameters listed which are required to be substituted in the equation above, following be noted:

1. Beta values that are available in the public domain are "levered"; the current project is funded from own funds (zero debt and 100% equity) and in order to make them comparable, the published Beta values of the companies have been "unlevered as per the following formula :

   Unlevered Beta = [Equity Beta/ {1+ (1-B)*A}], where,
   A = (mean debt / mean equity), and B = (mean tax/ mean Profit Before taxes) /62/.

   Thus the final results of unlevered beta and the mean unlevered beta to be considered are as follows:

Name	**Levered Equity beta**	**Unlevered Equity Beta**
CESC Ltd.	1.0779	0.7131
Gujarat Industries Power Co Ltd	1.2837	0.8307
TATA Power	1.0325	0.7385
Reliance Infrastructure Limited	1.8275	1.3526
Neyveli Lignite Corporation	1.5768	1.2467
BF Utilities	1.9681	1.4164
NTPC	0.6214	0.4476
Jaiprakash Power Venture Limited	1.7589	0.7637
GVK Power	1.4908	1.4216
Average		0.9923

2. The risk-free rate of **8.33%** is the assured return of Indian Government (host Country) bonds corresponding to 20 years maturity period, the data for the risk free-rate has been sourced from the central bank of India publication /66/. Thus, the value of risk-free return rate selected for the benchmark working is found to be appropriate.
3. The market return is the most conservative (the lowest) "market risk" return that an investor could have obtained by investing in scrips of BSE 100, BSE 200 or BSE SENSEX; these are the only three indices in the host Country for which reliable data is available for 20 years (post 1991) which represents the market of the post liberalization period of the host country. The market return is calculated as the Compounded Annual Growth Rate (CAGR) and is calculated by the formula:

   $CAGR = [\{(\text{Ending Value} / \text{Beginning Value})^{1/\text{No. of years}} - 1]$
   The CAGR computed for the three indices for which data is available for the analysis period of 20 years is as follows:

1	Market return (CAGR) computed as per BSE 100 Index	14.67%
2	Market return (CAGR) computed as per BSE 200 Index	14.05%
3	Market return (CAGR) computed as per BSE SENSEX	14.33%

The most conservative value of 14.05% among the above tabulated computed values of market return corresponding to the CAGR based on BSE 200 is considered for calculating the benchmark, required return on equity (RoE).
Substituting the above mentioned values for computing the RoE, the benchmark is arrived at as 14%.

DNV has verified the calculations and the data and confirm that the benchmark of 14% arrived at is in order. Further it is seen that the default value for the post-tax expected return on equity for Group I projects from India is 11.75% as per the "Guidelines on the assessment of investment analysis", version 5, EB 62, Annex 5 /33/. Converting this benchmark to real terms adopting the Reserve Bank of India (RBI)'s forecast of Expected Inflation Rate of 5.3% over the next ten years as per the "Survey of Professional forecasters" dated 2 February 2011 /70/ the benchmark works out to 17.67%.

Compared to this value of benchmark, the benchmark calculated as per the CAPM method (14%) is found to be more conservative and hence DNV confirms that the benchmark of 14% used for investment analysis of this project for comparison against the projected post-tax return on equity is appropriate.

Input parameters

The PP has also submitted an MS Excel sheet containing details of investment analysis /14/ along with supporting sheet for the benchmark (required return on equity) /15/ calculation.

The investment analysis has been carried out for 20 years /14/ which is also the lifetime of the project activity /59/. The input parameters used in the financial analysis have been assessed to be appropriate and correct as per following details:

Parameter	Value of the parameter used in the investment analysis	Assessment of the input parameters
Installed capacity of the project	27.3 MW (13 x 2100 kW)	DNV verified the capacity from the note dated 6 June 2011 put up for approval /17/ and the offer from supplier /18/ of the project activity. This was crosschecked from techno-commercial offer dated 4 December 2010 /18/ mentions the model S-88; the proposal is for 13 such machines each of capacity 2100 kW. Further, the copies of purchase orders for various components of the project equipment /4//5//6//7//8//9/ dated 15 June 2011 were also verified which aggregate to 27.3 MW.
Total project cost	INR 1,440.54 Million	The total project cost was verified from the note dated 10 December 2010 and 6 June 2011 put up for approval /17/ of the project activity. This was crosschecked from the offer of Suzlon Energy

<table>
<tr><td></td><td></td><td>Limited dated 4 December 2010 /18/ for supply, necessary connected civil works, erection and commissioning, including cost of land have been submitted by the PP, which formed the basis of the investment decision taken on 6 June 2011 /17/; the cost indicated for 27 MW (18 x 1500 kW) installed capacity project at Karnataka as per the offer dated 4 December 2010 was INR 1 620 Million; this was subsequently revised as per the note for investment proposal dated 6 June 2011 to INR 1440.54 Million as the location was changed to Rajasthan, and the installed capacity would be 27.3 MW (13 x 2100 kW).

The actual cost incurred by the PP is further confirmed by the certificate /24/ issued by a Chartered Accountant which confirms that the total cost incurred for the project as INR 1440.6 Million

Further, the project cost assumed for investment analysis is compared with the project cost of five registered wind power projects /37//38//39//40//41/ from the same state of Rajasthan in the host Country.

<table>
<tr><th>Project ID / Ref/</th><th>Installed capacity (MW)</th><th>Total project cost (INR in Million)</th><th>Cost / MW (INR in Million)</th></tr>
<tr><td>5531 /37/</td><td>1.5</td><td>89.98</td><td>59.98</td></tr>
<tr><td>5439 /38/</td><td>8.4</td><td>4685.10</td><td>55.78</td></tr>
<tr><td>5576 /40/</td><td>7.5</td><td>4020.00</td><td>53.6</td></tr>
<tr><td>5923 /39/</td><td>7.5</td><td>4500.05</td><td>60.01</td></tr>
<tr><td>5186 /41/</td><td>50.40</td><td>2989.82</td><td>59.32</td></tr>
<tr><td>Project under validation</td><td>27.3</td><td>1440</td><td>52.75</td></tr>
</table>

It can be inferred from the cost per MW that cost for the project activity is lower than all other comparable CDM registered projects located in Rajasthan.

Thus, the total project estimated cost of INR 1440 Million considered for investment analysis is considered appropriate.</td></tr>
<tr><td>Plant load factor</td><td>20.11% being equivalent to 48093MWh of net generation fed to grid</td><td>The change in project siting to Mokla, Jaislamer District, Rajasthan was approved by note dated 6 June 2011 /17/; the estimated generation provided by the supplier for the project site at Mokla for Suzlon model S-88 (2.1 MW capacity) is given as 3.7 million kWh per WTG /18/ . This translates to 20.11% PLF; the decision to seek CDM status was taken after considering the viability of the project</td></tr>
</table>

		based on "guaranteed generation provided by the supplier". It was also recorded that the actual generation may be lower to assess which in advance, a third party evaluation will be sought. Accordingly, as per the PLF determination report ref no. PEC/WRA/HZL/03 (revised) dated 31 May 2012 /13/ provided by Power & Energy Consultants, a third party engineering and consultancy firm, the site potential is determined as 19.76%. The wind resource assessment has been carried out based on the data captured by wind masts installed at Mokla, Habur & Mokla Daggi where the wind farm project was proposed to be set up. It is noted that the initial PLF study report had taken a PLF of 19.46% which was revised to 19.67% consequent to the correction in the transmission loss adopted. However, since the third party determined PLF was lower than the suppliers' estimate, the investment analysis has been conducted on the basis of PLF of 20.11% , which is more conservative. However, for estimating the emission reductions likely to occur as a result of the project implementation, the lower PLF value of 19.76% has been adopted, again for reasons of being conservative in estimations. The determination of wind resource assessment for the project by the third party consultants meets the requirement of EB guidance in the matter of reporting of PLF /35/.
Power tariff, consideration of transmission losses, and generation based incentive (GBI)	INR 4.22 / kWh Transmission loss of 4% GBI of INR 0.50/kWh	The investment analysis has assumed a tariff of INR 4.22 / kWh and this was cross checked with Power Purchase Agreement (PPA) dated 14 September 2011 /12/. This is also in line with the RERC order no. 11 dated 3 June 2011 /58/, which indicates the same tariff. Further, as per commissioning certificates /21/, it is confirmed that all the 13 x 2100 kW capacity project WTGs are connected to the metering arrangement located at the double line evacuation system at 220 kV Amarsagar Government Sub-station in Jaisalmer District. As per the Annexure B of the PPA, it is confirmed that for 132 and 200 kV metering systems, line losses of 4% shall be applicable on the metered energy units. Thus, the PP is compensated for 4% of net exported energy towards transmission losses by considering additional 4% of the energy exported and thereafter computing the quantity of energy exported for payment purpose. DNV has confirmed that there have been no subsequent changes to this and this remains at 4%. DNV has also verified invoices /26/ raised by the PP to confirm that the line loss compensated has

		remained unaltered at 4%. Generation based incentive at the rate of INR 0.50/kWh has been considered for computing the total revenue from power production from the project activity in the investment analysis presented by the PP /14/. DNV has referred to the guidelines for generation based incentives for wind power projects as per the directives of Indian Renewable Energy Development Agency (IREDA) and has confirmed that the unit has been registered for sanction of GBI /71/; it has further confirmed that the rate of INR 0.50/kWh considered, as also the ceiling, is in line with the guidelines. Further, as per paragraph 1 (i) of the guidelines /71/, the PP can opt for either GBI or accelerated depreciation but not for both. Accordingly, in the investment analysis presented the PP has not considered accelerated depreciation which is line with the statutory requirements and is considered appropriate. Thus, DNV has confirmed that all the parameters used by the PP in the investment analysis for computing the income from exported power as appropriate.
O&M costs	INR 1.8 Million / WTG payable form 2nd year onwards with a 5% annual escalation; 10.3% service tax extra on charges payable	The O&M costs was verified from the offer letter of Suzlon energy Limited /18/ and the note for approval /17/ as per which it is INR 1.8 M / WTG with service tax as extra. DNV has further crosschecked of the O&M charges considered by also comparing it with other recently registered projects the details of which are as follows : **Project Ref** — **O&M Cost details** 5531 — O&M Payable INR 1.685 Million from 2nd year; Total project cost: INR 89.981 Million; ie O&M charge payable is 1.87% of project cost / year; 5% annual escalation 5439 — O&M Payable INR 2 Million / WTG payable from 2nd year; project cost / WTG: INR 117.128 Million; ie O&M charge payable is 1.7% of project cost; 5% annual escalation 5576 — O&M Payable INR 7.8 Million from 2nd year onwards; Project Cost: INR 402 Million; ie O&M charge payable is 1.94% of project cost; 5% annual escalation 5923 — O&M Payable INR 8 Million from 2nd year onwards; Project cost: INR 450.005 M; ie O&M charge payable is 1.78% of project

<table>
<tr><td></td><td></td><td>
<table>
<tr><td></td><td>cost; 5% annual escalation</td></tr>
<tr><td>5186</td><td>O&M payable is 1.3% of project cost from 1st year onwards; 6% annual escalation</td></tr>
<tr><td>Project under validation</td><td>O&M payable is INR 1.8 MillionM/WTG from 3rd year onwards; Cost/WTG: INR 110.812 Million; ie O&M payable is 1.62% of project cost; 5% annual escalation</td></tr>
</table>
Thus, DNV is of the view that the O&M charges considered for investment analysis is in order.
</td></tr>
<tr><td>Insurance charges</td><td>0.11%</td><td>
The insurance charges adopted have been verified from the existing insurance policy taken by PP’s other existing wind power projects which is at the same rate of 0.11%.
A comparison with other registered projects is as follows:
<table>
<tr><td>Project reference</td><td>Insurance cost details</td></tr>
<tr><td>5531</td><td>0.14%</td></tr>
<tr><td>5439</td><td>Not indicated</td></tr>
<tr><td>5576</td><td>Not indicated</td></tr>
<tr><td>5923</td><td>0.15%</td></tr>
<tr><td>5186</td><td>0.12%</td></tr>
<tr><td>Project under validation</td><td>0.11%</td></tr>
</table>
Based on these data, DNV is of the opinion that the insurance charges adopted are appropriate.
</td></tr>
<tr><td>Depreciation rates</td><td>5.28%</td><td>The depreciation rate applicable as per section 205 of the Companies Act, Schedule XIV, II.1 (b) is 5.28% /50/ which has been used by the PP and hence considered appropriate.</td></tr>
<tr><td>Income tax rate and holiday</td><td>Regular rate : 33.22%
Minimum Alternate Tax (MAT) rate: 19.93%
IT holiday for 10 years</td><td>The company is liable to pay income tax on the profits made at the rate of 33.22% as per the tax rates applicable for Assessment Year 2011-2012 or MAT at 19.93% /61/. PP has submitted a Certificate dated 26 September 2011 from Mahendra Pokhrana & Co, Chartered Accountants, confirming the eligibility of the company to pay MAT at 19.93% /19/.
Further, benefit under section 80-IA in respect of infra-structure facilities /50/, which includes power generation and distribution companies, are eligible for 100% deduction of net taxable profit for period of 10 continuous years; this provision has been appropriately applied from 2011-2012 to 2020-2021.</td></tr>
</table>

Salvage value	10% of value of machinery and equipment plus cost incurred towards land acquisition	PP has calculated the residual value of the machinery and equipment at 10% of machinery cost. The salvage value is calculated as the residual value *plus* the original investment on land and has been included in the cash flow in the 20th year. DNV has also verified that the salvage value considered in other registered projects /37/ to /41/ is also on similar lines. Thus, a salvage value considered is appropriate.

This is a fully (100%) equity funded project which is confirmed by the Certificate issued by Nyati Mundra & Co., Chartered Accountants /24/. Working capital has not been considered in the investment analysis presented /14/.

Calculation and conclusion

DNV has received the investment analysis in MS Excel spreadsheet format /14/, which is unprotected, with no hidden cells / sections, references for all assumptions have been provided, and all algorithms presented in a transparent manner. The investment analysis has been conducted for 20 years, the full term of the life of the project /18/ /59/.

The PP has also submitted a detailed worksheet with computation details of benchmark /15/; workings for all alternatives considered have been presented and the most conservative among the alternatives results is selected as the benchmark (required return on equity) which is appropriate.

The post-tax equity IRR of the project over 20 years is 10.52% against the benchmark (post-tax return on equity) of 14%. All the tabulations have been verified by DNV and are found to be appropriate.

Sensitivity analysis

A sensitivity analysis has been carried out for the major parameters PLF, O&M, biomass price, electricity tariff and project cost which contribute to more than 20% of revenues or costs to check the robustness of the financial analysis. The level of variation assumed for the sensitivity analysis has been suitably justified with relevant documents pertaining to the presented analysis and has been verified by DNV, such as:

PLF:

The IRR reaches the benchmark if the PLF increases by 20%%.The RERC in tariff order dated 14 December 2011 /58/ has considered a PLF of 21% for sites in Jaisalmer; against this, the PP has considered a PLF of 20.11% based on suppliers' estimates for the project site. The PP has also presented the results of a +10% increase in PLF which if applied, results in an IRR of 12.3%; this is still below the benchmark of 14%.The PLF assumed by RERC is within the 10% range and hence is covered by the sensitivity analysis study. The third party assessment commissioned by the PP which is site specific and meets the requirements of *Guidelines for reporting and validation of Plant Load Factors* /35/, provides a PLF of 19.76%, which is lower than the PLF assumed for investment analysis;

DNV is of the opinion that increase in the PLF by 20% required to reach the benchmark is unlikely to be achieved.

Investment cost:

The IRR reaches the benchmark if the investment cost decreases by 17%.The project is commissioned and the actual cost incurred is INR 1440.556 million as verified from the purchase orders /2/ to /10/ and certificate issued by Chartered Accountant /24/. Additionally, DNV has compared the project cost with other recently registered projects and has demonstrated that it is the lowest. Hence a decrease of 19% in the project cost is an unlikely scenario.

Tariff:

The IRR reaches the benchmark if the tariff increases by 21%.The tariff used for the financial analysis (INR 4.22 / kWh) is based on the tariff specified in the RERC order dated 3 June 2011 /58/, which was available at the time of taking the decision and is also the rate specified in the PPA /12/.

Subsequent to the signing of the PPA, RERC revised the tariff vide its order dated 14 December 2011 /58/ to INR 4.46 / kWh in response to the judgement dated 30 May 2011 by the Appellate Tribunal for Electricity, thus providing an increase of about 5.7% over the rate assumed for investment analysis. This range of increase is covered by the sensitivity analysis already carried out. The rate determined by the PPA /12/ is valid for twenty years and further revision in the tariff is unlikely.

O&M Rate:

Even with no O&M costs, the IRR will be lower than the benchmark The equity IRR for the project is likely to exceed the benchmark (post-tax required return on equity) only if the O&M charges come down by 200% which is an unlikely scenario.

From the sensitivity analysis, it is seen that the benchmark is unlikely to be reached and therefore it is concluded that the project needs CDM revenues.

4.6.4 Barrier analysis

PP has proceeded to present common practice analysis as permitted by the “Tool for the demonstration and assessment of additionality” /31/.

4.6.5 Common practice analysis

As a consequence of the enactment of Indian Electricity Act, 2003 /51/, State Electricity Regulatory Commissions (SERC) were established as per section 82, part X, of that central act. Among other things, the responsibility of the SERC consists of tariff determination for generation, supply, distribution, transmission, wheeling, purchase and procurement of power. Each state has its own regulatory commission in place and decides upon various issues based on its input received from the stakeholders. Thus, the regulatory regime policies differ from one state of India to another.

Similarly, each state has its Renewable Energy Development Agency, under the umbrella organization IREDA, each one of which come up with different policies for establishment, development and licensing procedures for renewable energy projects. Thus, in India, the regulatory environment for the power sector in general and renewable energy in particular is governed by the policies, regulations and tariff orders implemented at the respective states. As a consequence, the investment policies and climate, tariff structure, incentive schemes, and guidelines, differ from state to state /45//54//55//56//57/ and hence the conditions prevailing across the entire country is not homogeneous.

The state of Rajasthan has been considered as the applicable geographic region which DNV considers as justified based on the following reasons:

1. As per paragraph 5 of the applied tool /31/, applicable geographical area may be chosen and confined to a smaller area, such as a state, than the host country for *technologies that vary* considerably from location to location depending on local conditions.
2. As per paragraph 9 of the applied tool /31/, *different technologies* are those that deliver the same output (in this case, generation of electricity from renewable sources), but differ by at least one of the five ('a' to 'e') specified parameters. The tariff determined per unit of electricity (kWh) is the sole source of revenue for an investor in renewable energy and hence it would be correct to consider the tariff applicable in various states for wind power based electricity as having a direct influence on the investment climate; following are the tariff prescribed by four states, as on the date of decision making for this project (June 2011), including that of Rajasthan where the project activity is located.

State	Tariff order reference	Tariff (INR / kWh)	Estimated investment cost/ (INR in Million / MW)
Tamil Nadu	Order no. 1 dated 20 March 2009 extended up to 31 December 2011 as per order dated 8 April 2011	3.39	53.5
Gujarat	Order no. 1 dated 30 January 2010	3.56	50.0
Karnataka	Order dated 11 December 2009	3.40	42.50
Rajasthan	Order no.11 dated 3 June 2011	4.22	52.50

The applicable tariff determines the financial flows of the project being the sole source of revenue and has a direct bearing on the investment pay-back period. Thus, considering the state of Rajasthan as the applicable geographic area is justified because the *technologies* differ from state to state, having met the conditions stipulated for *different technologies* as per paragraph 9 (d) and (e) of the additionality tool /31/.

The project activity comprises of establishing a wind turbine generator, a renewable source based power generating unit, in a country where the common prevailing practice is to establish a fossil fuel based power generating unit. This constitutes *switch of technology with change of energy source* and is covered under paragraph 6 of the additionality tool /31/.

Thus, the step wise approach as defined in Step 1 to Step 4 of paragraph 47 is applicable to the project activity.

Accordingly, the following details are provided:

STEP 1: Applicable output range has been calculated as 13.65 MW to 40.95 MW, being +/- 50% of the installed capacity of the plant, which is 27.3 MW.

STEP 2: In this step, PP has calculated the value of the factor N_{all} being equal to the number of non-CDM projects in the State of Rajasthan (applicable geographic area) that deliver the same output in the applicable range of 13.65 – 40.95 MW. Details of hydro and thermal power plants are sourced from the publicly available CEA Database, Version 6 /42/, and cross

checking for CDM registration is done by referring to the UNFCCC project cycle search link. Based on the above, following data is obtained:

S_NO	NAME	UNIT_NO	DT_ COMM	CAPACITY MW AS ON 31/03/2009	STATE	SECTOR	SYSTEM	TYPE
1	RAMGARH GT	2	12-Jan-96	35.5	RAJASTHAN	STATE	RRVUNL	THERMAL
2	RAMGARH GT	3	7-Aug-02	37.5	RAJASTHAN	STATE	RRVUNL	THERMAL
3	RAMGARH ST 1	4	31-Mar-03	37.8	RAJASTHAN	STATE	RRVUNL	THERMAL
4	J.SAGAR	1	10-Jan-73	33	RAJASTHAN	STATE	RRVUNL	HYDRO
5	J.SAGAR	2	10-Feb-73	33	RAJASTHAN	STATE	RRVUNL	HYDRO
6	J.SAGAR	3	18-May-73	33	RAJASTHAN	STATE	RRVUNL	HYDRO
7	MAHI BAJAJ-I	1	22-Jan-86	25	RAJASTHAN	STATE	RRVUNL	HYDRO
8	MAHI BAJAJ-I	2	6-Feb-86	25	RAJASTHAN	STATE	RRVUNL	HYDRO

Accordingly, there are 5 hydro and 3 thermal power projects in the applicable geographic area for the output range, which are non-CDM.

By referring to the information under the table "STATE-WISE/YEAR-WISE LIST OF COMMISSINED BIOMASS POWER/COGENERATION PROJECTS (AS ON 31.03.2011)" provided in the Ministry of New and Renewable Energy (MNRE) /68/, DNV has ascertained that there are 5 biomass based projects in Rajasthan, but none of them fall in the selected range.

Nuclear power plant details are available in the CEA database /42/ and it is confirmed that there are no nuclear power units in the applicable range.

No renewable marine energy plant is commissioned as yet in India /68/.

Details of wind power projects are sourced from the Directory-Indian Wind Power dated August 2010 and are as shown in the next table. It can be inferred from the data in the table that there are 7 wind power projects in Rajasthan in the applicable range; out of these 6 projects are registered with CDM EB and one project is webhosted and is under validation /68/.

Name of investor	Installed capacity-MW	Result of cross-check with UNFCCC registration
Enercon Wind Farms (Jaisalmer) Private Limited	24.6	Part of registered project no. 0310, total bundled project capacity 54 MW, balance by 18 investors /68/
DLF Home Developers	33	Part of registered project no. 3642 of capacity 67.5 MW; 33 MW in Rajasthan and 34,5 MW in Tamilnadu /68/
Enercon Wind Farms (Hindustan) Ltd	28.8	Part of registered project no. 1168 of total capacity 60 MW /68/
Enercon Wind Farms (Hindustan) Ltd	31.2	Part of registered project no. 1168 of total capacity 60 MW /68/

Kohinoor Planet Construction Pvt Ltd	24	Registered project no. 4679 /68/
Modern Road Makers Pvt Ltd	20	Registered project no. 3839 /68/
Hindustan Petroleum Corporation Limited	21.25	Part of 25 MW capacity bundled wind power project; CDM PDD webhosted for public consultation /68/

To compute the value of N_{all}, considering details provided above,

N_{all} = Number of non-CDM (thermal + hydro+ nuclear + tidal + wind) energy plants = (3 + 5 + 0 + 0 + 0)

=8

STEP 3: The technology applied in the project activity is of converting the kinetic energy in wind to electrical energy; this is different from the technology applied in thermal (conversion of heat content), hydro (conversion of flowing water), nuclear (conversion of energy of nuclear fission), and tidal (conversion of the mechanical energy contained in oceanic waves). Thus, N_{diff} = (3 + 5 + 0 + 0 + 0)

= 8

STEP 4: The factor F is calculated as = $(1 - N_{diff}/N_{all})$ = (1- 8/8) = 0; thus, F is LOWER than 0.2

Further, $N_{all} - N_{diff}$ = 8-8 = 0; thus, $(N_{all} - N_{diff})$ is lower than 3.

Thus, the project activity fulfils the condition for being considered as NOT common practice.

In conclusion, it can be summarised as follows:

1. That, the PP has correctly identified all alternatives to the project activity consistent with prevailing laws and regulations,
2. That, a financial analysis of the project activity has established that the project activity is financially not attractive; that, a sensitivity analysis has further demonstrated that even with a reasonable variation of the major assumptions, it is not likely to turn financially attractive, and that, the extent of variation required for the parameters to turn the project financially viable is not likely to happen, and,
3. That, the project activity is not common practice in the sector within the applicable geographic region.

Hence, the emission reductions achieved by the project activity are additional to any that would happen in absence of the project.

4.7 Monitoring

The project generates electrical power from wind energy; the applicable methodology is ACM0002, 12.3.0. The project does not involve use of fossil fuels, is neither a geothermal power plant, nor a hydropower plant, and hence according to the methodology, the project emissions are zero.

Also, leakage emissions are not considered as per the methodology. Thus, only the baseline emissions are to be monitored.

The project monitoring plan is in compliance with the monitoring methodology ACM0002 (version 12.3.0). The monitoring plan will give opportunity for real measurement of emission reductions achieved and the monitoring arrangements have been physically verified by DNV during the site visit assessment /72/. It is DNV's opinion that the project participants are able to implement the monitoring plan.

4.7.1 Parameters determined ex-ante

The project demands monitoring of total power exported to grid and the Combined Margin grid emission factor. The former is done as per the requirements of the applied consolidated methodology ACM0002, version 12.3.0 /29/, and the latter is prescribed in the methodology to be calculated done as per the "Tool to calculate the emission factor of an electricity system", version 2.2.1 /30/.

The project activity is located in Rajasthan which is served by the NEWNE grid /42/. The power generated by the project activity is exported to the NEWNE grid and hence, the NEWNE grid is identified as the relevant project electricity system in accordance with the requirements of STEP 1 of the tool

In India, Central Electricity Authority, under the Ministry of Power, Government of India, compiles and publishes a comprehensive database containing the necessary data on CO_2 emissions /42/ for all grid-connected power stations in India. This facilitates adoption of authentic baseline emissions data and also to ensure uniformity in the calculations of CO_2 emission reductions by CDM project developers.

The PP has exercised the option available under STEP 1 and has correctly chosen to calculate OM as the simple operating margin emission rate of the exporting grid, determined as described in Step 4 (a), by demonstrating that the conditions for this method, as described in STEP 3 of the tool apply to the system grid.

Share of must-run (hydro/nuclear) for the NEWNE grid is as per the details given below which has been verified against the data provided in the CO_2 Baseline Database for Indian Power Sector, Version 6 /42/.

Share of Must-Run (Hydro/Nuclear) (% of Net Generation)					
	2005-06	**2006-07**	**2007-08**	**2008-09**	**2009-10**
NEWNE	18.0%	18.5%	19.0%	17.4%	15.9%

Based on the above, it can be seen that the (historical 5-year) average share of must-run in the NEWNE grid based on the previous 5 years' data is 17.76% which is below 50% and this fulfils the condition stated under step 3 of the Tool.

Further, the Simple OM ex-ante option is chosen, as per which the emission factor is determined once at the validation stage; thus no monitoring and recalculation of the emissions factor during the crediting period is required.

Under step 4 (a), the Simple OM is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO_2/MWh) of all generating power plants serving the system, not including low-cost/must-run power plants/units. Under the ex-ante option, for grid power plants, a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation should be used.

The project was webhosted on 23 December 2011 /47/ and the CO_2 Baseline Database for Indian Power Sector, Version 6, is dated March 2011 and is the most recent data available at the time the project was submitted for webhosting.

The data sourced from the CO_2 Baseline Database for Indian Power Sector, Version 6 /42/ and the calculation of Simple OM as per the stated procedure is as follows:

Data for year	2007-08	2008-09	2009-10
Ex-post Simple OM (tCO_2/MWh)	0.9999	1.0066	0.9777
Net generation in OM (MWh)	401641.59 (a)	421802.6 (b)	458043.1 (c)
Generation weightage [(a/a+b+c), (b/a+b+c), (c/a+b+c)]	0.3134183	0.329151	0.357431
Generation weighted Simple OM (tCO_2/MWh) ex-ante	0.9942		

The Build Margin emission factor is calculated as in Step 5 mentioned in the tool /30/; the build margin emission factor on *ex ante* basis is calculated based on the most recent data available for sample group *m* at the time of CDM-PDD submission to the DOE for validation. CEA has calculated the build margin accordingly and has published the values.

The value of Build Margin (BM) (in tCO_2/MWh) for 2009-2010 is the most recent year for which published data is available as per CO_2 Baseline Database for Indian Power Sector, Version 6 /42/. The value for BM is: 0.8123 tCO_2/MWh.

The PP has chosen to calculate the weighted average Combined Margin (CM) which is the preferred option as per the Tool /30/. As per equation (14) give therein, we have,

$$EF_{grid,CM,y} = EF_{grid,OM,y} * w_{OM} + EF_{grid,BM,y} * w_{BM}$$

Where:

$EF_{grid,CM,y}$ = Build margin CO2 emission factor in year *y* (tCO2/MWh)

$EF_{grid,OM,y}$ = Operating margin CO2 emission factor in year *y* (tCO2/MWh)

W_{OM} = Weighting factor of operating margin emissions factor (%)

W_{BM} = Weighting factor of build margin emissions factor (%)

DNV has verified the data available in the database /42/ and has checked the tabulated values and accordingly can confirm that the values to be substituted for $EF_{Grid,OM,y}$ and $EF_{Grid,BM,y}$ in the above equation are as below, expressed in tCO_2/MWh:

$EF_{Grid,OM,y}$ = 0.9942

$EF_{Grid,BM,y}$ = 0.8123

Further, the Tool specifies that the default values for W_{OM} and W_{BM} for wind powered electricity generation activities shall be 0.75 and 0.25 respectively. Accordingly, the Weighted Average Combined Margin for NEWNE grid on ex-ante basis is 0.9487 tCO_2/MWh, which

shall be used without further monitoring throughout the selected first crediting period of seven years.

4.7.2 Parameters monitored ex-post

The project activity is a green field power generation activity. Therefore, the parameter/s to be monitored is/are:

Quantity of net electricity generation supplied by the project plant/unit to the grid in year y, expressed in MWh, to be measured at the project activity site by electricity meters on a continuous basis with at least monthly recording, complete with provisions for cross checking the recorded data with records for electricity sold such as the invoices raised by the PP.

The WTGs installed in the project activity generate 3-phase power at 690 V /59/, which is continuously measured by meters installed in the control panel located within the tower and are recorded by microprocessor based system. Various data, including generated power, are logged continuously and monitored by a Central Monitoring Station equipped with Supervisory Control and Data Acquisition (SCADA). These meter readings are referred to as controller meter readings.

The transformer yard located adjacent to the WTG steps up the generated power to 33 kV and clusters of such WTGs, including the project WTGs, have common cluster metering points; these are pooled together and transmitted to the 220 kV Suzlon's Mokla sub-station; in turn all the WTGs are finally evacuated through double line at the 220 kV Amarsagar sub-station /21/.

Based on the readings of the Controller meters, 33 kV meters, Suzlon Mokla Sub-station and 220 kV meter monthly readings of the Amarsagar sub-station, RVPNL, the statutory body which controls the power distribution in the state of Rajasthan, calculates the distribution losses, apportions it among the connected WTGs, and issues a statement of net electricity supplied to the grid to each PP.

The electricity exported from the sub-station will be metered using electronic, bidirectional, tri-vector meters. A main and check meter of 0.2 accuracy class would be installed for every feeder at the sub-stations of Suzlon and RVPNL. On a monthly basis, a joint meter reading will be carried out in the presence of the state electricity board officials and representatives of the project promoters.

The net electricity supplied to the grid can be cross checked from the sale invoice. It is to be noted that the total quantity billed includes 4% transmission losses, which is shown separately in the invoice. Thus, cross checking the invoiced quantity serves as a tool to verify the net exported power used for emission reductions, which is sourced from the share certificate issued by the statutory authority. In case of any difference between the two, the lower of the two shall be considered for emission reduction calculations.

The details of the calculation of net energy exported is as follows :

Data / Parameter details	Procedure	Details	Remarks
X - Sum of gross electricity generated by all WTGs connected to substation (MWh)	Readings of controller meters of all WTGs connected to the sub-station as per details	Controller meters, microprocessor based, tested once in three years	Monthly

	submitted by O&M provider		
Y - Sum of gross electricity generated by all WEGs owned by PP in project activity (MWh)	Readings of controller meters of all project activity WTGs connected to the sub-station as per details submitted by O&M provider	Controller meters, microprocessor based, tested once in three years	Monthly
A - Total electricity exported to the grid measured at the substation by all connected WTGs (MWh)	Readings recorded jointly by the RVPNL officers and PP's representative at the 220 kV Amarsagar sub-station	Main and Check meters of 0.2s accuracy class; bidirectional; lines 1 and 2 ; energy meters shall be calibrated annually	Monthly
B - Total electricity imported to the grid measured at the substation by all connected WTGs (MWh)	Readings recorded jointly by the RVPNL officers and PP's representative at the 220 kV Amarsagar sub-station	Main and Check meters of 0.2s accuracy class; bidirectional; lines 1 and 2 ; energy meters shall be calibrated annually	Monthly
$EG_{PJ,export,y}$ - Electricity exported to the grid by the project activity	Calculated based on above readings using the formula shown in next column		$EG_{P,export,}$ =[(Y)/(X)]*A
$EG_{PJ,import,y}$ - Electricity exported to the grid by the project activity	Calculated based on above readings using the formula shown in next column		$EG_{P,import,y}$ =[(Y)/(X)]*B
$EG_{PJ,y}$ – Net electricity exported to the grid by the project activity	Calculated based on $EG_{P,export,y}$ and $EG_{P,import,y}$ as per formula shown in next column		$EG_{p,y}$ = ($EG_{P,export,y}$ - $EG_{P,import,y}$)

Additionally, a procedure to be followed for the first and last months of the monitoring period if the start and end dates do not coincide with the date of the joint meter readings of the energy meters has been given; this consists of multiplying $EG_{p,y}$ with an apportioning ratio. The apportioning ratio is calculated as,

= (Sum of gross electricity generated by all WEGs owned by PP in project activity till such date) / (Sum of gross electricity generated by all WEGs owned by PP in project activity in the whole month)

The PP has put in place a monitoring team and has finalized a contract for obtaining O&M services /11/, which includes extensive assistance in monitoring. The team members have clearly defined responsibilities and duties, details of which are provided in the PDD /1/.

4.7.3 Management system and quality assurance

The monitoring plan clearly indicates the responsibilities for monitoring, recording, reporting, and verification of data. The monitoring records will be kept for a period of 2 years beyond the monitoring period. Procedures for data storage, archival and preservation of records have been established.

The competence of the members of the monitoring team was confirmed during site visit /72/. The PP already has other registered CDM projects (Ref no. 1824) and has obtained repeated issuances of CERs. Thus, the monitoring team is expected to be adequately trained in implementing and discharging the requirements in a satisfactory manner.

The bi-directional tri-vector energy meters of accuracy class of 0.2s shall be calibrated once in a year by the statutory authorities while the controller meters shall be calibrated once in three years by the O&M service provider.

4.8 Algorithms and/or formulae used to determine emission reductions

The project activity is a wind based power generation activity and hence project emissions are zero and leakage emissions are also zero as per methodology. Thus, only baseline emissions are to be considered which comprises of CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions (BE_y) are calculated as per equation (6) of the methodology ACM0002, version 12.3.0, which is as follows:

$$BE_y = EG_{PJ,y} \cdot EF_{grid,CM,y}$$

Out of these two parameters, $EG_{PJ,y}$ is monitored ex-post as described in 4.7.2 and $EF_{grid,CM,y}$ is fixed ex-ante for the entire crediting period (first renewable period of 7 years) as described in 4.7.1.

The net power exported to the grid is reckoned as the power exported at the 200 kV Amarsagar sub-station and hence is the most conservative as it is after the incidental transformation and transmission losses. It is calculated based on readings of meters of accuracy class 0.2s which fulfills the statutory requirement for metering as specified in Indian Electricity Act, 2003 and CEA Metering Rules /51/. The meter readings are recorded in the presence of statutory government appointed officials and the PP's representative.

Similarly, the NEWNE grid Combined Emission factor is calculated based on the specified procedure of the tool /30/and is based on values provided by the statutorily appointed body for this purpose, the CEA, which is available in the public domain. Thus, this meets all the conditions of completeness, accuracy and transparency.

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 44 627 tCO_2e per year for the selected 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 baseline emissions and emission reductions. All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.

4.9 Environmental impacts

The proposed project activity contributes to generation of electricity from renewable source and the investment is expected to contribute to the economic development of the region. Thus, the project activity is expected to have only beneficial impacts and no adverse impacts are foreseen. As per the Ministry of Environment and Forests (MoEF) notification dated 14 September 2006 amended by notification dated 1 December 2009 /65/ an environmental impact assessment is required only for projects included in the schedule of the notification and wind power projects are not mentioned in the schedule, so no environmental impact assessment is required as per statute for this project and hence has not been conducted for this project.

The PP has also committed to earmark 2% of CER revenues towards sustainable development activities which fulfils the requirement of legislation in the host country (India). Details of the same are provided in Annex 5 to the PDD.

4.10 Comments by local stakeholders

The PP has conducted the local stakeholder consultation meeting as required by CDM modalities. Public notice dated 22 August 2011 /20/ inviting local stakeholders for a consultation meeting at the office of Suzlon Infrastructure Services Limited, L&D Centre, 3, Gokul, Behind Batia Bagchi, Hanuman Chauraha, Jaisalmer, scheduled for 7 September 2011 at 11.30 AM has been submitted. Invitees included employees, community memebers, suppliers, statutory regulators, NGOs and local village residents.

The attendance records for the meeting conducted on 7 September 2011 at Jaisalmer as per the schedule and copies of minutes of consultation meeting /20/ have also been submitted for verification. A summary of the questions raised have also been presented in the PDD under section E.2 /1/.

Salient features of the project, nature of the technology employed and its environment friendliness, were explained to the gathering during introductory sessions; subsequently, questions were invited from the local stakeholders; the minutes of the meeting indicate that the questions raised by the stakeholders have been adequately and satisfactorily addressed by PP; they also acknowledge that the implementation of the project activity has helped improve the local infrastructure, has provided more employment opportunities for the local population, and desire that more such projects be taken up. There were no negative or adverse comments that needed a review of the project implementation.

DNV considers that the local stakeholder consultation carried out was adequate.

Comments by Parties, stakeholders and NGOs

The PDD, version 1, dated 19 December 2011, was made publicly available on the CDM website /48/and Parties, stakeholders and NGOs, through the CDM website, were invited to provide comments during a 30 days period from 23 December 2011 to 21 January 2012.

Refer:
https://cdm.unfccc.int/Projects/Validation/DB/VGV3WHX2XVWSVB5Q8RE10ZG0BURZRL/view.html

Two comments were received and are given (in unedited form) in the below text box along with the response by PP and the conclusions by DNV for each issue.

Comment by: Lawrance

☐ Accredited NGO ☐ Party ☒ Stakeholder

a) Purpose of the project and how the proposed project activity reduces greenhouse gas emissions are not briefed in the PDD. Refer section A.2.

PP response: The purpose of the project activity and description of how GHG emissions are reduced are already included in section A.2.

DNV: Section A.2 of the PDD states the purpose of the project is to contribute to the reduction of GHG emissions by embracing the technology of power generation through renewable sources. This section also describes in a nutshell how anthropogenic GHG emissions caused by fossil fuel based power generation are expected to be reduce such GHG emissions. DNV considers the PP's response to stakeholder comment as appropriate and adequate.

b) How environmentally safe and sound technology is used for the project and details of technology transfer is not demonstrated adequately. Refer A.4.2

PP response: PP would like to clarify that the said wind power projects are environment friendly project. This has been explained in section A.2 and A.4.3 of the PDD.

DNV: The project activity contributes to "clean energy" and the technology is indigenously available.

c) Non- debundling nature of the project activity is not adequately justified as per EB54 Annex 13 (Debundling tool). Refer A.4.5.

PP response: PP would like to clarify that the project is a large scale project and hence the query is not applicable.

DNV: This is a large scale project by a single investor and does not involve any bundling and so DNV considers this as not pertinent for the project activity.

d) Please check the project boundary of the project activity is not based on the guidance of the applicable project category.

PP response: The project boundary has been modified to comply to the guidance in the PDD.

DNV: There was a minor exclusion in delineating the project boundary in the original PDD which was the subject of a clarification request by DNV as a part of its validation process. The revised PDD has been verified by DNV and it is confirmed that the project boundary indicated meets the applicable guidance.

e) Why has option A (Combined margin) been chosen for calculating emission factor is not justified. Refer B.6.

PP response: PP would like to clarify that the combined margin has been calculated based on the UNFCCC tool to calculate the grid emission factor.

DNV: DNV verified and confirms that the combined margin considered meets the guidelines of EB on the subject.

f) The justification of choosing IRR as financial indicator is not adequately justified. Whether it is equity or project IRR, pre-tax or post tax is not mentioned in the PDD.

PP response: The IRR chosen is Post tax equity IRR, and same is now clearly specified in the PDD. The justification for selection of the financial indicator is included in section B.5.

DNV: DNV has verified the revised PDD and excel sheets and confirm that post tax equity IRR has been adopted which is in compliance with the guidelines on investment analysis.

g) The emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants.

PP response: PP would like to clarify that the combined margin emission factor for the NEWNE grid has been applied, and has been determined based on the UNFCCC tool to calculate the grid emission factor.

DNV: DNV verified and confirms that the emission factor considered meets the guidelines of EB on the subject.

h) Basis of choosing PLR as benchmark is not adequately demonstrated in the PDD.

PP response: PP would like to clarify that PLR is not taken as benchmark in the project activity. The benchmark is calculated based on required rate of return of equity determined using CAPM.

DNV: DNV confirms that PLR has not been adopted as benchmark.

i) All the issues of investment analysis guidelines are not discussed in the PDD. Refer B.5.

PP response: PP has updated section B.5 of the PDD in line with the investment analysis guidelines.

DNV: As a part of validation process, DNV has raised specific CAR and CL with respect to investment analysis which have been closed after assessing their adequacy in meeting the guidelines in this regard.

j) Justification of parameters including O&M, insurance, loan, derating, escalation, and tariff are not demonstrated with justification. Refer B.5.

PP response: PP would like to clarify that the supporting documents / references for all input values to investment analysis have been submitted to the DOE for validation. There is no loan or derating considering in the investment analysis.

DNV: This is a fully equity funded project; derating of the WTGs have not been considered; the tariff at the time of decision making has been correctly considered; there is no fixed annual escalation for the tariff; the effect of revised tariff has been studied by DNV before

concluding on the additionality of the project. All supporting documents and reference links have been verified by DNV.

k) Please provide a proof for proposed debt to equity taken at the investment decision. Refer B.5

PP response: The project is a 100% equity project and the proofs have been submitted to DOE for the same.

DNV: PP's response is justified and appropriate. Necessary documents have been submitted and verified as a part of validation process to confirm that the project is based fully on equity.

l) Proof for PLF is not justified.

PP response: The PLF report by a reputed third party consultant has been used and suitably compared with applicable tariff orders in the state.

DNV: The PLF assumed is backed by a third party certificate which has carried out a wind resource assessment for the site. DNV has verified and confirm that it meets the requirements of EB 48, A11.

m) Date of offer is not provided

PP response: The date of the offer has been included in the revised PDD.

DNV: Necessary documents have been submitted and verified by DNV.The required information is included in the revised PDD as a part of validation process.

n) Project cost is not as per state norms. Refer B.5.

PP response: Project cost has been based on the offer letter, actual POs raised and actual project cost incurred has been certified by a CA.

DNV: The project cost has been verified with the purchase orders issued and also compared with other registered projects and are found to be correct.

o) O&M charges and its escalation is not as per norms

PP response: O&M cost has been validated based on the offer letter, and actual POs raised.

DNV: The O & M costs has been verified with the agreement for O& M service and also compared with other registered projects and found appropriate.

p) IT rate assumed is not as per standard practice.

PP response: Same has been revised and appropriately applied as per the prevalent rates along with the references

DNV: The IT rates applied have been verified as applicable for corporate bodies; certificate from the Chartered Accountants has been received and verified to confirm that the rates applied are appropriate.

q) The application of MAT which is based on tax holiday while calculating WACC is not appropriate.

PP response: PP would like to clarify that CAPM is used to calculate the benchmark and not WACC

DNV: The benchmark used is post-tax return on equity and not WACC; the applicability of MAT has been confirmed by a certificate issued by the Chartered Accountants.

r) The PP has not explained and justified the key assumptions and rationale.

PP response: Same has been appropriately explained and justified.

DNV: All the assumptions have been verified against the corresponding data and are confirmed to be correct and appropriate.

s) The PP and consultant has not Illustrate in a transparent manner all data used to determine the baseline emissions.

PP response: The baseline emissions calculations are transparently included in the PDD and has been demonstrated to DOE as well.

DNV: Baseline emissions are calculated as per the applied methodology and the corresponding tool and are confirmed to be correct.

t) Not demonstrated that the proposed project activity is additional as per options provided under attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities.

PP response: PP would like to clarify that the Attachment A to Appendix B is applicable for small scale project activities. Additionality has been demonstrated applying the latest Tool for demonstration of Additionality.

DNV: This is not a SSC project activity permitting adoption of Attachment A to Appendix B. Additionality has been demonstrated as required for large scale projects as stipulated by EB.

u) National policies and circumstances relevant to the baseline of the proposed project activity are not being summarized clarify.

PP response: National policies and circumstances are discussed in section B.5 (sub-step 1b).

DNV: Baseline is as stated in the methodology and national policies and circumstances have been factored in wherever applicable.

v) Explain and justify all relevant methodological choices for the proposed project activity

PP response: The PDD already explains the relevant methodological choices for the proposed project activity (section B.4)

DNV: DNV has referred to the PDD and confirms that it meets all the requirements.

w) Data that is calculated with equations provided in the approved category or default values specified in the category should not be included in the compilation.

PP response: The application of methodology equations for ex-ante estimation of CERs is suitably explained in section B.6.3.

DNV: All calculations presented in the PDD have been verified by DNV and are found to be correct, and are as per stipulated requirements

x) CER revenue assumed is not consistently applied

PP response: PP would like to clarify that the sharing of 2% of CER revenues for sustainable development is suitably discussed in PDD as per requirements of the DNA.

DNV: All calculations presented in the PDD have been verified by DNV and are found to be correct, and are as per stipulated requirements; CER revenue assumed for contribution for sustainable development activities is verified and is found to meet the requirements.

y) Project cost is not as per norms, DOE has to check and clarify.

PP response: Project cost is based on the offer letter, actual POs raised and actual project cost incurred certified by a CA

DNV: Project cost, like all other parameters included in the financial analysis, has been thoroughly verified and is found to have been based on real, appropriate and correct basis.

z) The project cost of the project should be based on offer and not on purchase order or tariff order.

PP response: Project cost is based on the offer letter, actual POs raised and actual project cost incurred certified by a CA

DNV: Project cost, like all other parameters included in the financial analysis, has been verified and is found to be appropriate.

aa) O&M charges considered are on higher side. Pls. clarify.

PP response: O&M cost has is based on the offer letter, actual POs raised and actual cost incurred certified by a CA

DNV: O&M expenses,like all other parameters included in the financial analysis, has been verified and are found to be appropriate.

bb) Benchmark calculation is not as per WACC tool (EB53 Annex 8)

PP response: PP would like to clarify that CAPM is used to calculate the benchmark and not WACC

DNV: Benchmark calculation, like all other parameters included in the financial analysis, has been verified and are found to be appropriate.

cc) Whether pre-tax or post tax IRR is selected is not demonstrated in the PDD.

PP response: PP would like to clarify that post tax equity IRR is applied. This has been specified in the revised PDD.

DNV: DNV confirms that the financial indicator used is post-tax equity IRR to be compared against the selected benchmark of required post-tax return on equity. This is adequately demonstrated in the PDD and in the Spreadsheet.

dd) The basis of calculation of benchmark is not documented in the section B.5. PLR is not acceptable benchmark for the project. WACC based on Government bonds, risk premiums should be taken.

PP response: Benchmark calculations have been explained in the PDD. The benchmark calculation spreadsheets have been submitted for validation.

DNV: Calculation of benchmark chosen has been verified and all underlying assumptions checked; it is documented in the PDD; benchmark chosen is post-tax required return on equity.

ee) Prior consideration of CDM which is important for the determination of additionality is not documented in the section B.5 of the PDD.

PP response: The dates relevant to prior consideration form have been included.

DNV: The requirements of prior consideration have been verified and are confirmed to meet the EB guidelines.

ff) Date of PPA is not mentioned in the prior consideration of CDM

PP response: The date of PPA signing is not relevant to CDM consideration. Dates related to prior CDM consideration form, offer letters, investment decision, validation, etc. have been included.

DNV: All the relevant requirements to establish prior consideration of CDM for the project activity have been complied with, records and documents verified; all requirements have been met.

gg) The selection of simple OM based on low cost/must run resources is not adequately justified. Refer B.6.1

PP response: *PP would like to clarify that the combined margin emission factor for the NEWNE grid has been applied, and has been determined based on the UNFCCC tool to calculate the grid emission factor. The explanations are included in section B.4.*

DNV: The guidelines of the tool to calculate the grid emission factor have been complied with in full.

hh) PP has not provided for each parameter the chosen value or, where relevant, the qualitative information.

PP response: Inputs for investment analysis are clearly discussed in section B.5.

DNV: All parameters included in the financial analysis, have been verified and are found to be appropriate.

ii) Please Provide the actual value applied. Where time series of data is used, where several measurements are undertaken or where surveys have been conducted, provide detailed information.

PP response: This is not applicable for the project activity.

DNV: All applied values have been verified and are confirmed to have been provided with requisite detailing and transparency.

jj) Explain and justify the choice for the source of data.

PP response: Inputs for investment analysis are clearly discussed in section B.5.

DNV: All parameters included in the financial analysis, have been veriifed and is found to be appropriate.

kk) Ex-ante option of calculating OM is not adequately demonstrated. Step 3 of Refer B.6.1PP response: *PP would like to clarify that the combined margin emission factor for the*

NEWNE grid has been applied, and has been determined based on the UNFCCC tool to calculate the grid emission factor. The explanations are included in section B.4.

DNV: All requisite demonstrations have been adequately applied as required by the applicable guidelines and the tool.

ll) Power plants registered as CDM project activities should be included in the sample group that is used to calculate the operating margin if the criteria for including the power source in the sample group apply. This argument is not demonstrated. B.6.1

PP response: *PP would like to clarify that the combined margin emission factor for the NEWNE grid has been applied, and has been determined based on the UNFCCC tool to calculate the grid emission factor. The explanations are included in section B.4.*

DNV: The applicable guidelines and the tool requirements are complied with; the OM, BM and CM calcualtions are based on the latest available CEA database, which is appropriate.

mm) The selection of option (out of two) for calculating OM is not adequately documented with justification. CEA calculation is based on net electricity generation, the average efficiency of each power unit and the fuel types used in each power unit. Step 4 of B.6.1

PP response: *PP would like to clarify that the combined margin emission factor for the NEWNE grid has been applied, and has been determined based on the UNFCCC tool to calculate the grid emission factor. The explanations are included in section B.4.*

DNV: The applicable guidelines and the tool requirements are complied with; the OM, BM and CM calcualtions are based on the latest available CEA database, which is appropriate.

nn) The argument that CEA data for build margin is calculated as per Emission factor tool is not documented. B.6.1

PP response: *PP would like to clarify that the combined margin emission factor for the NEWNE grid has been applied, and has been determined based on the UNFCCC tool to calculate the grid emission factor. The explanations are included in section B.4.*

DNV: The applicable guidelines and the tool requirements are complied with; the OM, BM and CM calcualtions are based on the latest available CEA database, which is appropriate.

oo) Spread sheet is not provided. The data should be presented in a manner that enables reproducing of the calculation of OM, BM, and CM.

PP response: *The spreadsheet for emission factor calculation has been submitted to the DOE.*

DNV: Spreadsheet for calculation of OM, BM, CM and estimate of emission reductions has been submitted, verified and are found to be correct.

pp) The justification of negligible project emissions for wind project is not as per AMS. I. D ver 16.0 EB 54).

PP Response: AMS I.D is not applied to the project activity.

DNV: Project emissions have been accounted for as per the applied methodology.

qq) The emission factor value (Southern grid) for calculating baseline emission is wrong. Refer B.6.3

PP Response: The project applies the NEWNE grid emission factor and not the Southern grid emission factor.

DNV: The appropriate emission factor for the system grid is correctly calculated. rr) Net electricity should be continuously monitored, hourly measured and at least monthly recorded. Refer B.7.1

PP Response: Sectio B.7.1 has been revised as per methodology requirements.

DNV: The monitoring plan meets the methodological requirements

ss) Metering regulations as per CEA norms is not adequately followed in monitoring plan. Refer B.7.2.

PP Response: The energy meters would be 0.2 accuracy class and would be in the purview of the state utility.

DNV:

The monitoring plan meets the methodological requirements

tt) Where the values have been measured, include a description of the measurement methods and procedures that comply with the guidance provided under general guidance.

PP Response: Sectio B.7.1 has been revised as per methodology requirements.

DNV: The monitoring plan meets the methodological requirements

uu) Provide a detailed description of the monitoring plan, including an identification of the data to be monitored and the procedures that will be applied during monitoring.

PP Response: Section B.7.1 has been revised as per methodology requirements.

DNV: The monitoring plan meets the methodological requirements

vv) The PP should include sources of data that will be actually used for the proposed project activity (e.g. which exact national statistics, actual measurement etc.).

PP Response: Section B.7.1 has been revised as per methodology requirements.

DNV: Source of data for all monitored parameters has been verified and are found to be appropriate.

ww) Where the parameters are to be measured in accordance with the guidance of the approved project category or the general guidance to the indicative methodologies, specify the measurement methods and procedures including accepted industry standards or national or international standards which will be applied, which measurement equipment is used, how the measurement is undertaken.

PP Response: Section B.7.1 has been revised as per methodology requirements.

DNV: The monitoring plan meets the methodological requirements

xx) Which calibration procedures are applied, what is the accuracy of the measurement method, who is the responsible person / entity that should undertake the measurements and what is the measurement interval?

PP Response: Calibration of tri-vector energy meters would be carried out by the state utility. Calibration of the WEG meters would be carried out by a third party. Accuracy of the measurement method would be detailed in the calibration certificates.

DNV: Responsibilities and duties of monitoring are clearly mentioned in the monitoring plan, which includes calibration and accuracy checking.

yy) Please provide a detailed description of the monitoring plan. Describe the operational and management structure that the project operator will implement in order to monitor emission reductions.

Response: Section B.7.2 has been revised as per methodology requirements.

DNV: Detailed monitoring plan has been submitted and verified to meet the methodological requirements and site practices.

zz) Clearly indicate the responsibilities for and institutional arrangements for data collection and archiving.

PP Response: Section B.7.2 has been revised as per methodology requirements.

DNV: Responsibilities and duties of monitoring are clearly mentioned in the monitoring plan, which includes calibration and accuracy checking.

aaa) The monitoring plan should reflect good monitoring practice appropriate to the type of project activity. Provide any relevant further background information.

PP Response: Section B.7.2 has been revised as per methodology requirements.

DNV: Detailed monitoring plan has been submitted and verified to meet the methodological requirements and site practices.

bbb) Please describe the process by which comments by local stakeholders have been invited and compiled. An invitation for comments by local stakeholders shall be made in an open and transparent manner, in a way that facilities comments to be received from local stakeholders and allows for a reasonable time for comments to be submitted.

PP Response: Local stakeholders were invited through public notice.

DNV: The process of local stakeholder consultation followed by the PP has been verified and was fould to have met all requirements; it included scheduling a meeting, inviting all the concerned to the meet, providing information, recording of attendance and interactions; minutes of meeting recorded have been verified

ccc) Project participants shall describe a project activity in a manner which allows the local stakeholders to understand the project activity.

PP Response: The project activity was explained during the stakeholder consultation meeting and the local stakeholders have a good understanding of the project activity.

DNV: The public notice, attendance sheet, and minutes of meeting have been verified and it is confirmed that all requirements of conducting the local stakeholder consultation meeting have been fulfilled.

Comment by: Benedict

☐ Accredited NGO ☐ Party ☒ Stakeholder

Hydro projects (ACM0002)

Layout of power transmission lines from the generation to the consumer with the metering system is not shown. It should include the distance of transmission lines. DOE has to check the meters are installed to monitor electricity generated, net electricity used in Bhutan, net electricity exported to India. Pls. clarify.

The status of the construction & commission of the project is not stated in the PDD.

What is the basis of calculation for transmission loss, auxiliary consumption and transformer losses? What is the length of transmission line?

The project is claimed to be run of river hydro project. So the calculation of reservoir is wrong. The criterion 3 is applicable only to pumped storage or accumulation hydro projects. What does reservoir refer to as per PP?

The justification of opting out alternative 3 and alternative 4 is not justified adequately. It should be based on latest published data and figures. Refer B.4. Pls. clarify.

The bilateral agreements, PPA with India are the documents, DOE to check thoroughly

Date of investment decision should be at the time of DPR preparation. So, the basis of the cost escalation factors at a later date for CDM consideration is not valid. Pls. clarify. Refer B5. Step 3a. (Investment barrier).

How the CDM benefit will alleviate the technical barriers. As per additionality tool, if the barriers are not alleviated by CDM, then the project is not additional.

Emission factor for state is not calculated.it should be made available to DOE to clearly validate this value. Emission factor for India is not as per "Tool for emission factor for the system".

Electricity generated by the project, auxiliary consumption, transmission losses, transformer losses, net electricity exported to India, net electricity exported to the grid. These parameters to be monitored continuously and to be cross checked with sale receipts.

The Meth mentions that if investment analysis option is used, apply the following:

a. Apply an investment comparison analysis, as per Step 3 of the .Combined tool to identify the baseline scenario and demonstrate additionality., if more than one alternative is remaining after Step 2 and if the remaining alternatives include scenarios P1 and P3;

b. Apply a benchmark analysis, as per Step 2b of the .Tool for the demonstration and assessment of additionality. If more than one alternative is remaining after Step 2 and if the remaining alternatives include scenarios P1 and P2.

But PP failed to apply like this. Pls. clarify.

PLF should be based on EB48 Annex 11guideline which says 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; (b) The plant load factor determined by a third party contracted by the project participants (e.g. an engineering company); But PDD doesn't demonstrate how PLF has been arrived at.

Whether PLF includes machine shutdown, machine availability. Whether grid availability is accounted for in the calculation of gross generation. To my surprise, critical parameter like PLF is missing from the PDD. How DOE has allowed this.

Common practice analysis should be based on EB 39 Annex 10 (Additionality tool). Each step of common practice analysis should be fulfilled as per tool.

Emission reduction calculation should be based on EB 50 Annex 14 "Tool for emission factor for the electricity system.

Whether only one set of main meter, check meter set is enough for three projects. The monitoring parameters need to be checked by DOE.

The main meter and check meter technical parameters like accuracy level, make, etc. needs to be mentioned in the PDD.

PP Response: The following queries were not applicable as the project activity is for wind power generation.

DNV: All relevant concerns expressed during the global stakeholder consultation phase have been duly addressed by the PP; the responses are found to be adequate, and appropriate

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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 ~~CAR 1~~
2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK ~~CAR 1~~
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	OK ~~CAR 1~~
4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	OK ~~CAR 1~~
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	
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	NA
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	NA
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	OK

Requirement	Reference	Conclusion
that would have occurred in the absence of the registered CDM project activity.		
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	☒ Clearly identifiable title of the project activity ☒ Version number of the PDD is included ☒ Date of the PDD is included.		OK
A.1.2 Is the PDD is in accordance with the applicable requirements for completing PDDs?	/1/ /34/	DR	☒ 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/ /5/ /6/ /7/ /8/ /9/ /10/ /72/	DR	*What type is the project?* ☐ Project in existing facility or utilizing existing equipment(s) ☐ Project is either a large scale project or a small scale project with emission reductions exceeding 15 000 tCO_2e per year. In this case, a site visit must be performed. ☐ Project is a bundled small scale project, with each project in the bundle with emission reductions not exceeding 15,000 tCO_2e 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. ☐ The project is an individual small scale		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				project activity with emission reductions not exceeding 15 000 tCO_2e per year. In this case, DOE may not conduct a physical site visit as appropriate. ☒ Greenfield project *How was the design of the project assessed?* ☒ Physical site inspection ☐ Reviewing available designs and feasibility studies Site visit was completed on 1 February 2012. All the 13 installations each of 2100 kW rating, manufactured, supplied, erected and commissioned as per purchase orders, copies of which were made available, were visited.		
A.2.2	If a greenfield project, describe the physical implementation of the project when the validation was commenced.	/1/	DR /I/	All the 13 x 2100 kW rated WTGs were found to have been installed and working; The WTG details and location provided in section A.4.1.4 of the PDD does not match with the location details and IDs noticed during site visit.	~~CAR 4~~ ~~CAR 2~~	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_2e per year), justify the sampling through a statistical analysis:	/1/	DR	Not applicable; all project installations have been inspected; no sampling is involved.		OK
A.2.4	Is the description of the proposed CDM project activity as 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?	/1/	DR	Yes, the description is complete and covers all salient aspects of project activity.	~~CAR 4~~ ~~CAR 2~~	OK
A.2.5	Does the project activity involve alteration of existing	/1/	DR	No, this is a greenfield project		OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	installations? If so, have the differences between pre-project and post-project activity been clearly described in the PDD?					
A.2.6	Does the project design engineering reflect current good practices?	/1/ /44/ /59/ /18/	DR	The WTG is manufactured, supplied, installed and commissioned by Suzlon Energy Limited; installed capacity of the WTG is 2.1 MW and the model is S-88; the product claims conformance to design standard GL 2003; it is type approved and is certified by the CWeT, Government of India and is listed as an approved model.		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/	DR	No transfer of technology is involved. The installed capacity of the WTG is 2.1 MW which at the time of ordering was the largest in its class. This would certainly incentivise further attempts to exploit the renewable source of wind energy to generate power.		OK
A.3	**Participation requirements (VVM para 51-54, 125-127)**					
A.3.1	Do all participating Parties fulfil the participation requirements as follows:	/1/ /27/	DR	The CDM requirement of obtaining approval by the Designated National Authority of the host Party confirming voluntary participation of the PP in the project activity and its contribution to sustainable development is not fulfilled.	~~CAR 1~~	
		India (host)		County X / Country Y		
	a) Party has ratified the Kyoto Protocol	☐ Yes ☐ No		☐ Yes ☐ No / ☐ Yes ☐ No		
	b) Party has designated a Designated National Authority	☐ Yes ☐ No		☐ Yes ☐ No / ☐ Yes ☐ No		
	c) The assigned amount has been determined	☐ Yes ☐ No		☐ Yes ☐ No / ☐ Yes ☐ No		
A.3.2	Do the letters of approval meet the following requirements?	/1/	DR	HCA awaited	~~CAR 1~~	
		India (host)		County X / Country Y	~~CAR 1~~	
	a) LoA confirms that Party has ratified the Kyoto Protocol	☐ Yes ☐ No		☐ Yes ☐ No / ☐ Yes ☐ No		
	b) LoA confirms that participation is voluntary	☐ Yes ☐ No		☐ Yes ☐ No / ☐ Yes ☐ No		

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
c) The LoA confirms that the project contributes to the sustainable development of the host country?			☐ Yes ☐ No NA NA		
d) The LoA refers to the precise project activity title in the PDD			☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No		
e) The LoA is unconditional with respect to (a) to (d) above			☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No		
f) The LoA is issued by the respective Party's DNA			☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No		
g) The LoA was received directly by the DNA or the PP			☐ DNA ☐ PP ☐ DNA ☐ PP ☐ DNA ☐ 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					
A.3.3 Have all private/public project participants been authorized by an involved Party?	/27/	DR	Host country approval awaited	~~CAR 1~~	
A.4 Technical description of the project activity (VVM para 58-64)					
A.4.1 Is the project's location clearly defined?	/1/ /72/	DR /I/	The project is located in two villages of Jaislamer district of the State of Rajasthan in India. The geographic coordinates of the 13 project installations have been provided in the PDD and were verified during site visit. The WTG details and location provided in section A.4.1.4 of the PDD does not match with the location details and IDs noticed during site visit.	~~CAR 4~~	OK
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/ /24/	DR /I/	No, no public funding is used for the project activity. The project is fully financed by PP from accumulated earnings; thus, it is fully equity financed project.		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
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/ /29/	DR	The project applies "Approved consolidated baseline and monitoring methodology ACM0002" "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 12.2.0	~~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/	DR	EB 65, Meeting report, Clause 89: "For all revised methodologies and tools that were approved by the Board at this meeting, the DOEs may upload not later than 25 July 2012 (24:00 GMT) for registration the project design documents (PDDs) of project activities in which the previous version of an approved methodology or an approved tool has been applied, in accordance with paragraph 36 of the "Procedure for the submission and consideration of requests for revision of approved baseline and monitoring methodologies and tools for large scale CDM project activities".		OK
B.2 Applicability of methodology (and tools) (VVM para 65-76) *Insert a row for each applicability criteria of the applied methodology (and tools)*					
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	/1/ /2/ /3/ /4/	DR	The project activity is installation of 13 x 2.1 MW WTGs for generation of power from wind energy to supply to the North East West North-East (NEWNE) grid and is a green field project.		OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	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).?	/5/ /6/ /7/ /8/ /9/ /10/				
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/ /21/	DR	The project activity is a green field project that uses wind energy to generate electricity. It proposes to install 63 x 800 kW capacity wind mills to achieve this objective.		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/ /72/	DR /I/	The project activity is not one of capacity addition, retrofit or replacement. The newly installed and commissioned wind turbines were under operation at the time of site visit.		OK
B.2.4	How was it validated that project complies with the following applicability criteria: The methodology is not applicable to the following a)	/1/	DR	The project activity does not involve fuel switch. Also it is neither a biomass fired power plant nor a hydropower plant. It involved installation and		OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	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/m2			operation of wind power generators as could be confirmed during site visit.		
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/ /29/ /30/	DR	Project activity is installation and operation of a new grid connected renewable power generating unit and baseline chosen is appropriate for such projects as defined in section II of the methodology.		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/ /42/	DR	The project boundary comprises of various components of the project activity such as the wind energy turbines, transformer yard, metering stations, connected sub-stations and all power plants physically connected to the NEWNE system grid.		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/ /29/ /42/	DR	All 13 wind energy converters of this project along with the attendant transformers, evacuation system, sub-station, other non-project WECs connected to the same sub-station, the system (NEWNE) grid and all the power plants connected to the NEWNE grid define the project boundary. In the baseline scenario, equivalent amount of power would have been sourced from the carbon intensive NEWNE grid and hence the baseline emissions consist of CO2 emissions equivalent to the displaced electricity. In the project activity scenario, no emissions		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			occur as power is generated by the conversion of renewable wind power. All these are correctly taken into account as per the selected methodology and accordingly described in the PDD.		
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/	DR	No. The project activity is generation of electricity for supply to grid using wind energy and so does not involve any other emission source not foreseen by the methodology.		OK
B.4 Baseline scenario determination (VVM para 81-88, 105-107) *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.*					
B.4.1 Which baseline scenarios have been identified? Is the list of baseline scenarios complete?	/1/	DR	As per the methodology, baseline for a new grid connected renewable power generating activity is clearly defined under section II. As the baseline is defined by the methodology which is applicable for the project under consideration, no alternatives need to be considered.		OK
B.4.2 How have the other baseline scenarios been eliminated in order to determine the baseline?	/1/	DR	According to the methodology, there is only one baseline scenario and this has been considered.		OK
B.4.3 What is the baseline scenario?	/1/	DR	The baseline applicable for a new, renewable		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				energy based, grid connected power plant is specified by the methodology as being the "Electricity delivered to the grid by the project activity that 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 grid, which is the system grid, has been sourced from CEA database version 6.		
B.4.4	Is the determination of the baseline scenario in accordance with the guidance in the methodology?	/1/	DR	The identified baseline is as per the scenario defined by the methodology.		OK
B.4.5	Has the baseline scenario been determined using conservative assumptions where possible?	/1/	DR	The grid considered is the regional grid comprising of grids serving the states in the North, East, West and North East regions of India. This is in line with the EB guidance and is conservative. The baseline scenario is as per the selected methodology.		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/	DR	Yes. National priority and sectoral policies encourage that renewable energy generation.		OK
B.4.7	Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR	The baseline determination is compatible with available data.		OK
B.4.8	Is the baseline determination adequately documented in the PDD? ● All assumptions and data used by the project participants	/1/	DR	The baseline determination is compatible with available data.		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
are listed in the PDD and related document to be submitted for registration. The data are properly referenced. • All documentation is relevant as well as correctly quoted and interpreted. • Assumptions and data can be deemed reasonable • Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD. • The methodology has been correctly applied to identify what would occurred in the absence of the proposed CDM project activity			• Assumptions used are listed in the PDD and the data are correctly referenced. • Quoted data are relevant and correct. • Assumptions are reasonable • Yes, national and sectoral circumstances are considered • The application of methodology is correct and identification of the scenario in the absence of project activity is reasonable.		
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/	DR	The "Tool for demonstration and assessment of additionality", Version 5.2, is used for assessing additionality, which is in line with the requirements of the applied methodology		OK
B.5.2 Have the regulatory requirements correctly been taken into account to evaluate the project activity and the alternatives?	/1/	DR	The narrations given under STEP 1 and STEP 2 in the PDD is not in line with the requirements of the "Tool for the demonstration and assessment of additionality"	~~CAR 5~~	OK
B.5.3 Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR	As in B.5.2	~~CAR 5~~	OK
B.5.4 What is the project additionality mainly based on (Investment analysis or barrier analysis)?	/1/	DR	The project additionality has been mainly based on investment analysis.		OK
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/	DR	The approval note dated 6 June 2011 mentions that the project needs CDM revenues to make the project "financially viable" and to "initiate action		OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				to appoint a consultant to facilitate the CDM process---“. Thus, this demonstrates that CDM revenues were seriously considered at the time of deciding to invest in the project implementation.		
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/	DR	The starting date is 15 June 2011as evidenced by the copies of purchase orders submitted for verification, which is after 2 Aug 2008. The PDD was webhosted for global stakeholder consultation on 23 December 2011. The prior consideration of CDM revenues for project implementation is evidenced by the information provided by UNFCCC on its website confirming registration of such communication on 18 July 2011, which is within 6 months of the start date. Copies of information sent to the EB, UNFCCC and NCDMA in accordance with the requirements of the “Guidance on the demonstration and assessment of prior consideration of the CDM” have not been provided along with copies of acknowledgment of receipt of such information.	~~CL 2~~	OK
	Investment analysis (VVM para 108-114) *The list of questions below must be adjusted to the parameters in the investment analysis relevant to the project under validation. All input parameters need to be assessed.*					
B.5.7	Does the project activity or any of the remaining alternatives generate revenues apart from CDM? Is this reflected in the PDD?	/1/ /33/	DR	Yes. The project activity generates revenue from sale of power to the grid and the same is mentioned in the PDD.		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.8	Do any of the alternatives to the project activity involve investment? Is this reflected in the PDD?	/1/ /33/	DR	One of the alternatives to the project activity, namely is continuation of status-quo which does not require investment.		OK
B.5.9	Is the choice of benchmark analysis, investment comparison or simple cost analysis correct?	/1/ /33/	DR	The choice of benchmark analysis is appropriate as the baseline for the project activity does not require any investment.		OK
B.5.10	Is the benchmark/discount rate the latest available at the time of decision?	/1/ /15/ /33/ /60/ /62// 64/ /66/ /67/	DR	Required return on equity on post-tax basis is considered as the benchmark. Please ensure that all available beta values at the time of decision making have been considered. Also review figures of risk free return rate used for investment analysis and ensure that all parameters considered for investment analysis should be for the same period. Further, the PDD states that levered beta values have been used to calculate cost of equity. Please provide justification for such use of levered beta instead of un-levering and re-levering the average unlevered beta for calculating cost of equity especially as this is a equity funded project.	~~CAR 9~~	OK
B.5.11	What is the financial indicator? Is it on equity/project basis? Before/after tax? Is the financial indicator in correspondence with the benchmark?	/1/ /15/	DR	The post-tax equity IRR is the financial indicator. It is in correct correspondence with the benchmark chosen, that is, the required return on equity on post-tax basis.		OK
B.5.12	Are the underlying assumptions appropriate, e.g. what is considered as waste in the baseline is considered to have zero value	/1/ /14/	DR	The financial analysis presented is incomplete as no references have been provided for the assumptions indicated; also units for values indicated is not provided (for ex: Project cost). References provided in the PDD for depreciation and applicable IT rates, and tariff orders are incomplete. Source document for technical specifications including life time, and reference	~~CL 3~~ ~~CL 1~~ ~~CL 7~~ ~~CAR 3~~	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			documents for insurance and overhead costs have not been made available.		
B.5.13 Does the income tax calculation take depreciation into account? Is the depreciation year in accordance with normal accounting practice in the host country?	/1/ /14/ /50/ /61/ /63/	DR	Yes, the IT calculation takes into account depreciation. The period for depreciation accounting is done as per the normal accounting practice. Justification and basis for claiming additional depreciation @ 20% has not been provided. Further, considering that the WTGs were commissioned on 30 Sep 2011, confirmation of correctness of charging of 50% depreciation is required. The IT holiday considered for the investment analysis needs to be confirmed; further, MAT credits available for PP has not been considered. It is seen that depreciation is charged on cost of land also and that the salvage value does not reckon the value of land at the end of life time of project. 1. The rates of IT and MAT used for 2011-2012 needs to be substantiated. 2. The insurance costs considered are for 17 WTGs whereas the project activity has only 13 WTGs installed. 3. Overhead expenses are not admissible under separate head of expenditure as they are a part of O&M expenses; further the annual escalation considered at 5% as well as overhead expenses, are neither substantiated nor referenced in the PDD. 4. The basis for claiming IT rebate of (-ve) INR1.15 Million is not established.	~~CAR 8~~ ~~CL 7~~ ~~CAR 7~~	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				5. Transmission loss considered for investment analysis @4% needs to be supported for its appropriateness. 6. MAT credits available have not been considered. 7. The eligibility for MAT has not been established. 8. The basis for claiming an IT rebate of INR 120 Million in 2025-2026 has not been established.		
B.5.14	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/ /14/	DR	The investment analysis has been carried out for 20 years which is the lifetime of the project. It is seen that depreciation is charged on cost of land also and that the salvage value does not reckon the value of land at the end of life time of project.	~~CAR 8~~	OK
B.5.15	When a feasibility study report or similar approved by the 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?	/1/ /14/	DR	Wind mills in India do not need a prior approval of the FSR. Thus, the basis for investment analysis is not derived from any FSR.		OK
B.5.16	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 VM paragraph 95.	/1/ /14/	DR	☐ 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 ☒ The plant load factor determined by a third party contracted by the project participants (e.g. an engineering company) ☐ Other approach. The PLF is based on the wind resource		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				assessment certificate issued by Power & Energy Consultants, a third party engineering consultant contracted by the PP. The PLF report issued by Power & Energy Consultants has been reviewed; in this regard, the following needs to be clarified : 1.The period for which the data is considered an d its relevance along with the date of issuance of the report to be provided. 2.The basis for assumption of transmission loss has not been mentioned. 3.The value provided at sl no. 4 in the table under section 7 of the report needs to be demonstrated; has it been arrived at after taking the SD into account and if so, how?	~~CL 5~~	
B.5.17	How was the output price (e.g. electricity price) 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/ /14/	DR	☒ Cross-check against third-party or publicly available sources (e.g. invoices or price indices) ☐ Review of feasibility reports, public announcements and annual financial reports related to the project and the project participants The tariff for electricity exported to grid is based on the RERC tariff orders but the reference is incomplete. The financial analysis presented is incomplete as no references have been provided for the assumptions indicated; also units for values indicated is not provided (for ex: Project cost). References provided in the PDD for deprecition and applicable IT rates, and tariff orders are incomplete.	~~CL 3~~	
B.5.18	How were the investment costs assessed? Were the data available and valid at the time of decision? Remember to	/1/ /14/	DR	☐ Cross-check against third-party or publicly available sources (e.g. invoices or price indices)		OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95			☒ Review of feasibility reports, public announcements, contracts and annual financial reports related to the project and the project participants The investments cost estimate is based on the techno-commercial offer received by the PP from Suzlon Energy Limited. Revised estimates considering changes in installed capacity and alternate siting were also made available to PP before the investment note was prepared for consideration by the management. It has been verified and confirmed that all this data were available to the PP at the time of decision making. Further, the estimated costs were compared against actual incurred costs based on copies of purchase orders made available.		
B.5.19	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/ /14/	DR	☒ Cross-check against third-party or publicly available sources (e.g. invoices or price indices) ☐ Review of feasibility reports, public announcements and annual financial reports related to the project and the project participants The estimated cost of O&M charges is based on the techno-commercial offer received by the party which was available prior to the date of decision making. PP to provide and clarify the basis of O&M charges adopted and the annual increase considered. The O&M charges are normally inclusive of insurance and all other administrative expenses; but, it seems the PP has considered	~~CAR 7~~ ~~CL 7~~	OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				these in addition to O&M costs. Further, the basis for the insurance costs and overhead costs has not been provided. .		
B.5.20	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.	/1/ /14/	DR	☒ Cross-check against third-party or publicly available sources (e.g. invoices or price indices) ☐ Review of feasibility reports, public announcements and annual financial reports related to the project and the project participants The IT holiday considered for the investment analysis needs to be confirmed; further, MAT credits available for PP has not been considered. References provided in the PDD for depreciation and applicable IT rates, and tariff orders are incomplete.	~~CAR 7~~ ~~CAR 8~~	OK
B.5.21	Was the financial calculation spreadsheet verified and found to be correct?	/1/ /14/	DR	1. The cash outflow for purchase of capital assets is not shown in the year it is reported to have occurred. 2. The relevance of indicating 2010-2011 in the spread sheet is not clear. 3. Please express all values in Millions only (not in lakhs and crores) 4. It is stated that the company is paying MAT. Please submit copies of latest annual report to evidence this.	~~CAR 8~~ ~~CAR 7~~	OK
B.5.22	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?	/1/ /14/	DR	Sensitivity analysis has been carried out by altering the following parameters in a range of ±10%: 1. PLF 2. Tariff 3. Investment costs 4. O&M Costs		OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				Sensitivity analysis has not been carried out to determine at what percentage of change of selected parameters does change in results occur and the probability of such an occurrence.	~~CAR 10~~	
B.5.23	Sensitivity analysis: Is the range of variations is reasonable in the project context?	/1/ /14/ /33/	DR	The range considered is in compliance with the "Guidelines on investment analysis"		OK
B.5.24	Have the key parameters been varied to reach the benchmark and the likelihood of this to happen been justified to be small?	/1/ /14/	DR	Sensitivity analysis has not been carried out to determine at what percentage of change of selected parameters does change in results occur and the probability of such an occurrence.	~~CAR 10~~	OK
	Barrier analysis (VVM para 115-118)					
B.5.25	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/	DR	Investment barrier is the sole barrier considered for demonstration of additionality.		OK
B.5.26	How were the investment barriers assessed to be real? Are the investment barriers substantiated by a source independent of the project participants?	/1/	DR	Insufficient returns on investment is presented as the investment barrier.		OK
B.5.27	How does CDM alleviate the investment barriers?	/1/	DR	The investment barrier is due to inadequate returns on the investment; the CER revenues will considerably mitigate the low returns.		OK
B.5.28	Is the project activity prevented by the investment barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	The alternative to project activity is baseline scenario and it can continue to prevail in the absence of project activity. The implementation of project activity is likely to remain unrealized without CDM incentives.		OK
B.5.29	How were the technological barriers assessed to be real? Are the technological barriers substantiated by a source independent of the project participants?	/1/	DR	Not applicable		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.30	How were the barriers due to prevailing practise assessed to be real? Are the barriers due to prevailing practise substantiated by a source independent of the project participants?	/1/	DR	Not applicable		OK
B.5.31	How were the other barriers assessed to be real? Are the other barriers substantiated by a source independent of the project participants?		DR	Not applicable		OK
Common practice analysis (VVM para 119-121)						
B.5.32	What is the geographical scope of the common practice analysis? Is this justified?	/1/	DR	The State of Rajasthan is the geographical scope considered. Regarding Common Practice analysis presented in the PDD, following needs to be completed: 1. Please provide copy of Indian Wind Power Directory (or the relevant pages) from which the data has been sourced. 2. Some of the web-links provided in the table are found to be not working. 3. Please provide justification for having considered only the State of Rajasthan for carrying out the analysis. 4. Please justify the cut-off date considered.	~~CL 4~~	OK
B.5.33	What is the scope of technology and size (e.g. capacity of power plant) for the common practice analysis and how has this been justified?	/1/	DR	All large scale (15 MW and above) have been considered. The choice of this needs to be justified.	~~CL 4~~	OK
B.5.34	What is the data source(s) used for the common practice analysis?	/1/	DR	The Indian Power Directory and UNFCCC website are the data sources considered.	~~CL 4~~	OK
B.5.35	How many similar non-CDM-projects exist in the region within the scope?	/1/	DR	There are no other similar non-CDM projects	~~CL 4~~	OK
B.5.36	How were possible essential distinctions between the project activity and similar activities assessed?	/1/	DR	Please see B.5.32	~~CL 4~~	OK
B.5.37	What is the conclusion of the common practice analysis?	/1/	DR	That investing in non-CDM large scale wind	~~CL 4~~	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				projects is not a common practice in the State of Rajasthan		
	Conclusion					
B.5.38	What is the conclusion with regard to the additionality of the project activity?	/1/	DR	Awaiting corrective actions and clarifications and can be concluded only after perusal of the same.	~~CL4~~ ~~CAR 7~~ ~~CAR 8~~ ~~CAR 9~~ ~~CAR 10~~ ~~CL 3~~ ~~CL 7~~	OK
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 $_{Grid,OM,y}$ (Operating Margin Emission Factor of NEWNE Grid) available at validation verified?	/1/	DR	As per the procedure specified in the "Tool to calculate the emission factor for an electricity system", generation based weighted average for the three most recent years has been calculated to arrive at the Simple OM on ex-ante basis. The CEA CO_2baseline database, version 6, has been used for obtaining the OM for the NEWNE grid.		OK
B.6.2	How was the EF $_{Grid, BM,y}$ (Build Margin Emission Factor) available at validation verified?	/1/	DR	The CEA CO_2baseline database, version 6, has been used for obtaining the BM for the NEWNE grid. The BM emission factor calculation approach is in accordance with "Tool to calculate the emission factor for an electricity system". Option 1 of STEP 5 of the referred tool has been applied to calculate the BM for the first crediting period ex-ante. Accordingly, the value for the		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			most recent information available is for 2009-2010 and the value indicated for the NEWNE grid in the database is 0.81231 tCO_2/MWh.		
B.6.3 How was the $EF_{Grid,y}$ (Combined Emission Factor for the NEWNE grid of India) available at validation verified?	/1/	DR	The CM has been calculated as the weighted average as per STEP 6 (a) of the "Tool to calculate the emission factor for an electricity system". Owing to its intermittent and non-despatchable nature, wind based power generation activities are allowed to use weightage factors of 0.75 for OM and 0.25 for BM throughout their crediting periods. These directions have been complied with and the CM has been calculated accordingly.		OK
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/	DR	Baseline emissions include only CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. Accordingly, baseline emissions have been estimated as the product of net electricity supplied to the NEWNE grid by the project activity per year and grid emission factor of the NEWNE grid; this is in accordance with equation (6) of the selected methodology. The CM for the system grid (NEWNE) has been calculated as a combination of Simple OM and BM by applying permitted weightage factors for wind power generation. The values for OM and BM are calculated and sourced based on data available from the official website of the Central Electricity authority (CEA) CO_2 Baseline Database - Version 6.0.	~~CL 5~~	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				Baseline emissions are equal to the product of power exported to the grid multiplied by the CM emission actor. The power likely to be exported to the grid is estimated on the basis of the Plant Load Factor (PLF) certificate issued by a third party. The baseline emission calculations are in accordance with equation 6 of the selected baseline methodology and have been documented appropriately.		
B.6.5	Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	The emission factor has been sourced from the CEA database version 6; the User Guide to the database provides a detailed approach adopted for arriving at the various values in the published database. Section 4.5 of the User Guide lists out the various measures taken to ensure conservativeness. The other factor contributing to the calculation of baseline emissions is power exported to the grid which is estimated based on the PLF certificate issued by a third party.	~~CL 5~~	OK
B.6.6	Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	Yes.		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/	DR	Since the project activity is electricity generation from wind energy there is no project GHG emission and this complies with the methodology with respect to project emission computation.		OK
	Leakage (VVM para 89-93)					
B.6.8	Are the leakage calculations documented according to the approved methodology and in a complete and transparent	/1/	DR	This is not applicable as the project activity is electricity generation from wind energy. This is in compliance with the requirements of the		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
manner?			methodology in this regard.		
Emission Reductions (VVM para 89-93)					
B.6.9 Algorithms and/or formulae used to determine emission reductions: • 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/	DR	All assumptions and data used are listed in the PDD and are properly referenced. Documents are correctly interpreted, values are reasonable, and the methodology has been correctly applied as detailed in above paragraphs. The estimate of emission reductions is presented in an MS Excel sheet with proper interlinking, algorithms and formula.		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/	DR	A schematic metering diagram clearly indicating the unique ID of the WTG, feeder to which connected, and details of meters installed, has not been included in the PDD. Provide details in a table containing following details: 1. Unique ID of the WTG 2. Metering details, if any, in the transformer yard (690 V to 33 kV) 3. Connected feeder number, and installed meter details at the 33 kV / applicable sub-station and at 66 kV/220 kV sub-station Designate each meter and provide procedure adopted to calculate net amount of power exported based on above meter readings. It is observed that the monitoring practices	~~CAR 11~~	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				adopted at the site are not fully covered under the monitoring plan provided in the webhosted PDD which needs to be revised to be in line with methodology requirements and the actual site practices.		
B.7.2	Does the monitoring plan contains all necessary parameters, and are they clearly described?	/1/	DR /I	The monitoring plan consists of measuring and / or measuring and calculating the following parameters: 1. $EG_{p\ export,y}$ - Electricity exported to the state electricity board by the project activity (measured & calculated) 2. $EG_{p\ import.y}$ - Electricity imported from the state electricity board by the project activity (measured & calculated) 3. $EG_{p\ generated}$ - Total electricity generated by the project activity (measured) The Combined Margin emission factor of the system electricity grid, the NEWNE grid, is calculated ex-post and is fixed for the entire length of the crediting period. Thus, the monitoring plan contains all necessary parameters, method of measuring / calculating and is clearly described.		OK
B.7.3	In case parameters are measured, is the measurement equipment described? Describe each relevant parameter.	/1/	DR /I	For $EG_{p\ export,y}$ $EG_{p\ import.y}$: The project WTGs are connected to designated feeders, and each feeder is provided with a metering point at the sub-station. All the meters are electronic tri-vector, bi-directional type, capable of measuring both export to the grid and import		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				form the grid. A set of main and check meter would be installed for every feeder at the sub-station of the state electricity board. Each feeder will have several WTGs connected to it, some of which may not be part of this project activity. An apportioning procedure would be carried out to calculate electricity exported from the project activity. This procedure is described in the PDD. $EG_{p\ generated}$ is measured continuously and recorded on the SCADA system on an hourly basis by a microprocessor based instrument panel which is an integral part of each WTG installed. Monthly reports of power generated by each turbine are provided to the PP by Suzlon Infrastructure Limited.		
B.7.4	In case parameters are measured, is the measurement accuracy addressed and deemed appropriate? Describe each relevant parameter.	/1/	DR /I	All meters installed for monitoring of the project activity are of 0.2s accuracy class. This fulfils the relevant regulatory requirements prevalent in India in respect of metering of power and hence is considered appropriate.		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/	DR / I	The main and check meters shall be tested for accuracy and calibrated once in a year with reference to a portable standard meter. The meters shall be deemed to be working satisfactorily if the errors are within specifications for meters of 0.2 accuracy class. Suzlon Infrastructure Limited is appointed as		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				the operation and maintenance contractor for all the WTGs; the work description includes monitoring as per the plan described in the PDD. The O&M personnel are qualified engineers and are trained by Suzlon Infrastructure Limited. This was confirmed by DNV during site visit.		
B.7.6	Is the monitoring frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR / I	Power exported and imported to and from the grid are measured continuously and recorded on a monthly basis. Based on these readings and as per the apportioning procedure, the net power exported to the grid by the project activity is calculated on a monthly basis and a report is provided by the regulatory authority to the PP. The power generated is measured continuously, recorded hourly and a monthly generation report is prepared. This data is used in the apportioning procedure.		OK
B.7.7	Is the recording frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR / I	The recording frequency as described above is adequate, meets the methodology requirements, and permits accurate calculation of GHG emission reductions due to the project activity. The PP raises an invoice for the net exported quantity of power on a monthly basis which is used for counter checking the quantity of net power exported used for calculating GHG emission reductions.		OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				All the data are preserved for 2 years beyond the last verification period as stipulated by the methodology.		
	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/	DR	The PP is a listed company with a history of good management practices. The organization for monitoring is well defined and roles and responsibilities have been clearly stated. SISL is entrusted with the task of day-to-day monitoring activities as part of their O&M contract; SISL is already managing many such facilities and it can be expected that the monitoring plan as envisaged will be implemented and adhered to.		OK
B.7.9	Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)?	/1/	DR	Monthly generation data are provided by the O&M contractor in soft format to the PP which is stored. Monthly meter readings and statement of share of exported power issued by the DISCOM is also archived by PP.		OK
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/	DR	The monitoring plan requires power exported to be monitored and the procedures established are adequate to cover this aspect.		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/	DR	Yes, all records of data generation, net power exported, and corresponding invoices raised will be preserved for a minimum period of two years after the end of crediting period.		OK
	Monitoring of sustainable development indicators/ environmental impacts					
B.7.12	Is the monitoring of sustainable development indicators/	/1/	DR	Yes, host Party (India) does mandate monitoring		OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	environmental impacts warranted by legislation in the host country?			of sustainable development indicators for large scale projects. Legislation in India does not mandate environmental impact studies to be conducted for wind based projects.		
B.7.13	Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	The Indian DNA requires developers of large scale projects to spend at least 2% of CER revenues for Sustainable Development including society/community development. A monitorable action plan has to be included in the PDD.	~~CL 8~~	OK
B.7.14	Are the sustainable development indicators in line with stated national priorities in the host country?	/1/	DR	No sustainable indicator has been defined by India. However, the contribution by the project activity to contribute to environmental, economic, technological, and social development is assessed by the Indian DNA prior to issuance of Host Country Approval as required under CDM modalities.	~~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/ /2/	DR	The start date has been reckoned as 15 June 2011 based on the earliest date of purchase orders placed for various equipment. However, we note that the contract for construction work is dated 15 March 2011 and the nature of the work ordered for is project specific. Given these circumstances, the earliest date of commitment to action related to project implementation should be treated as 15 March 2011; accordingly, 15 March 2011should be treated as the project start date.	~~CL 6~~	OK
C.1.3	Is the stated expected operational lifetime of the project	/1/	DR	Justification of total project cost, total life time,	~~CAR~~	OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	activity reasonable?			generation, O&M Cost, and escalation of O&M costs based on RERC / CERC orders and in comparison with other registered projects from the same region has not been provided.	~~8~~	
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 PP has chosen renewable crediting period of 7 years with the crediting period starting from 1 December 2012; it is also stated that crediting period shall not start before the date of registration.		OK
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/	DR	As per the Ministry of Environment and Forests (MoEF), Government of India, Environment Impact Notification S.O. 1533 dated 14 September 2006, read together with notification number S.O.695 (E) dated 4 April 2011, wind power projects are not covered under any schedule and thus environmental impact assessment is not required for the project activity.		OK
D.1.2	Does the project comply with environmental legislation in the host country?	/1/	DR	As per the present statutes no specific environmental clearances are required for wind energy based power generation projects in India. However, as a renewable energy project which is aspiring for CDM registration, the project is expected to abide by the requirements of the Indian DNA.	~~CAR 6~~	OK
D.1.3	Will the project create any adverse environmental effects?	/1/	DR	The project is one of wind energy based power energy generation and is not expected to create any adverse environmental effects.		OK
D.1.4	Have identified environmental impacts been addressed in the		DR	Not applicable		OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	project design?					
D.1.5	Has an analysis of the environmental impacts of the project activity been sufficiently described?		DR	Not applicabel		OK
D.1.6	Are transboundary environmental impacts considered in the analysis?			Not applicable		OK
E Stakeholder Comments (VVM para 128-130)						
E.1.1	Have relevant stakeholders been consulted?	/1/	DR	Documents in respect of local stakeholder consultation meeting have not been submitted; following documents are required: 1. Copy of notice informing the stakeholders about the proposed meeting 2. Copy of attendance sheet at the meeting 3. Copy of minutes of meeting 4. List of concerns expressed and proposed action	~~CAR 12~~	OK
E.1.2	Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	Pl see E.1.1	~~CAR 12~~	OK
E.1.3	If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR	There is no India specific requirement to carry out a local stakeholder consultation process for wind powered projects. However, the PP has conducted a local stakeholder consultation meeting.		OK
E.1.4	Is a summary of the stakeholder comments received provided?	/1/	DR	Pl see E.1.1	~~CAR 12~~	OK
E.1.5	Has due account been taken of any stakeholder comments received?	/1/	DR	Pl see E.1.1	~~CAR 12~~	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 CDM requirement of obtaining approval by the Designated National Authority of the host Party confirming voluntary participation of the PP in the project activity and its contribution to sustainable development is not fulfilled.	A.3.1 A.3.2 A.3.3 A.7.14	Copy of HCA submitted	Letter of Host Country Approval for the project reference no. 4/6/2012 dated 14 September 2012 by the National CDM Authority, Ministry of Environment and Forests, Government of India, has been received and verified. Consistency between the HCA and PDD in respect of the project title and the PP's name has been noted; further, it is confirmed that the participation is voluntary and the project contributes to sustainable development. CAR 1 is closed.
CAR 2 Responses to global stakeholder comments have not been provided.	4.11 of this report	Many of the comments are not applicable to the project activity. Comments received in global stakeholder process relevant to the project activity have been addressed in the responses to the queries below.	All applicable comments have been addressed suitably and DNV opine that the responses are appropriate and justified. CAR 2 is closed.
CAR 3 Basis for following has not been provided: 1. WTG technical specifications 2. Basis for insurance costs 3. Basis for overhead costs	A.2.2 A.2.4 A.4.1	1. WTG technical specifications are enclosed 2. Basis for insurance costs are being submitted. 3. The overhead costs are not being considered in the revised financial analysis	Copy of technical specifications of the WTG has been received /19/. Copy of policy schedule which includes current premium rates applicable for existing WPP received /26/. As the PP has removed the overhead costs from consideration, this is no more relevant and issue is closed. CAR 3 is closed.

CAR 4 The WTG details and location provided in section A.4.1.4 of the PDD does not match with the location details inspected during site visit.	A.2.2 A.2.4	The WTG details and locations have been corrected in the PDD.	The corrections made in the PDD have been verified and the details of WTGs and location match with the site findings /72/ and hence CAR 4 is closed.
CAR 5 The version of the methodology applied in the PDD is not likely to be valid at the time of submission of project for registration. The project must meet the applicability conditions mentioned in the tool and this has not been established. The narrations given under STEP 1 and STEP 2 in the PDD is not in line with the requirements of the "Tool for the demonstration and assessment of additionality"	B.1.1 B.5.2 B.5.3	The methodology version mentioned in the PDD has been revised (version 12.3.0). The applicability of the project activity to the tools mentioned in B.1 is established in section B.2 of the revised PDD. The narrations given under STEP 1 and STEP 2 have been revised in line with the requirements of "Tool for the demonstration and assessment of additionality"	The version of the applied methodology has been changed in the revised PDD which is noted. Further, it has been verified to confirm if all the requirements of the new version of the applied methodology have been addressed and it is found to be in order. Under section B.2 of the revised PDD, the applicability conditions of the Tools /30//31/ have been discussed. The revisions under STEP 1a and STEP 2of the revised PDD under section B.4 have been suitably changed and is found to meet the requirements of "Tool for the demonstration and assessment of additionality". CAR 5 is closed.
CAR 6 Copies of clearance for the project installation from the State Electrical inspectorate and letters of commissioning have not been provided.	D.1.2	Copies of the clearance from Rajasthan Renewable Energy Corporation Ltd, and commissioning certificates are being submitted.	Copies of required documents have been submitted and verified /22/. CAR 6 is closed.
CAR 7 The basis of O&M charges adopted and the	B.5.13	The offer letter from Suzlon dated 4/12/2010 is enclosed as evidence of O&M cost. Further the O&M agreement with	1. Letter offering O&M services along with terms dated 4 December 2010 /18/ has been received and verified. It is confirmed

annual increase considered is not provided. The O&M charges are normally inclusive of insurance and all other administrative expenses; but, it seems the PP has considered these in addition to O&M costs. Further, the basis for the insurance costs and overhead costs has not been provided. The insurance costs considered are for 17 WTGs whereas the project activity has only 13 WTGs installed The eligibility for MAT has not been established. The basis for claiming an IT rebate of INR 120 M in 2025-2026 has not been established.	B.5.21 B.5.38	Suzlon is enclosed. The O&M agreement does not cover insurance charges and administrative expenses which are paid separately by the project proponent. 2. The insurance costs are assumed based on PP's past experience in implementing wind power projects. The evidence of insurance cost incurred is enclosed. The overhead costs for the project are not being considered in the revised financial analysis. 3. The insurance costs are revised for 13 WTGs and the same has been incorporated in the financial analysis 4. PP would like to clarify that the company is registered under Companies Act,1951 and is paying MAT. The CA certificate confirming that MAT is applicable for the company is being submitted. 5. Income tax rebate in 2025-26 has been removed and the same has been revised in the financial analysis.	that it does not include insurance charges. PP has dropped consideration of administrative charges in revised investment analysis. 2. Copy of policy schedule from Oriental Insurance Company Limited /25/ providing details of premium charged for existing wind power project assets of the PP has been received and verified. 3. In the revised Investment analysis spread sheet submitted the insurance costs are considered for 13 WTGs which is found to be correct. 4. The CA certificate regarding eligibility of MAT /19/ has been received, verified and accepted. 5. IT rebate for 2025-2026 is found to be correct and hence accepted. CAR 7 is closed.
CAR 8 It is seen that depreciation is charged on cost of land also and that the salvage value does not reckon the value of land at the end of life time of project. Justification and basis for claiming additional depreciation @ 20% has not been provided. Further, considering that the WTGs were commissioned on 30 Sep 2011, confirmation	B.5.10 B.5.13 B.5.14 B.5.21	Depreciation on cost of land is ignored and cost of land has been reckoned at the end of lifetime of project and is added in salvage value. 2. The additional depreciation is not being considered and the same has been revised in the financial analysis.	1. Land cost has been removed from consideration of depreciation which is correct and hence accepted. 2. Removal of consideration of additional depreciation is found to be correct and hence accepted. 3. Considering full depreciation for the first year is confirmed to be correct and hence accepted.

of correctness of charging of 50% depreciation is required. The IT holiday considered for the investment analysis needs to be confirmed; further, MAT credits available for PP has not been considered The rates of IT and MAT used for 2011-2012 needs to be substantiated and applicability of MAT to the company needs to be justified with evidence. The cash outflow for purchase of capital assets is not shown in the year it is reported to have occurred. The relevance of indicating 2010-2011 in the spread sheet is not clear.		3. Considering that the WTGs are commissioned on 30 Sep 2011, rate of depreciation has been applied at 80% from the first year itself. 4. The IT holiday considered for the investment analysis is in accordance with section 80 IA of Income Tax Act, which is referred from http://law.incometaxindia.gov.in/DitTaxmann/IncomeTaxActs/2005ITAct/section80ia.htm 5. The PP would like to clarify that the wind power project is owned by HZL and is not under SPV. Hence, MAT credit is not available for the project and the same has not been considered for financial analysis. 6. The IT and MAT rates considered for the year 2011-12 in financial analysis has been referred from source http://www.incometaxindiapr.gov.in/incometaxindiacr/contents/forms2010/pamphets/COMPANIES_2012_13.htm The The CA certificate confirming that MAT is applicable for the company is being submitted. 7. The cash outflow has occurred in the financial year 2011-12 and the same has been incorporated in the financial analysis 8. Year 2010-11 has been removed from the	4. IT holiday for a continuous period of 10 years has been correctly considered and the correct link has been referred. 5. It is confirmed from the Financial Expert that the issue of not considering MAT credit is correct and hence accepted. 6. The applicable IT and MAT rates have been correctly stated and the correct links have been provided. The CA certificate confirming that the company is paying Mat has been received, referred to the financial expert and accepted. 7. Cash outflow has been shown in the year it has reported to have occurred and hence accepted. 8. Indicating 2010-2011 was an error which has now been corrected and hence accepted. Since all issues have been responded satisfactorily, CAR 8 is closed.

		financial analysis spread sheet	
CAR 9 All available beta values at the time of decision making have not been considered. The applicability of the risk free rate considered has not been established. The values considered for IRR are not for uniform period Further, the PDD states that levered beta values have been used to calculate cost of equity. Please provide justification for such use of levered beta instead of un-levering and re-levering the average unlevered beta for calculating cost of equity especially as this is a equity funded project.	B.5.10 B.5.38	Available beta values of power sector listed companies have been considered for beta calculation at the time of decision making (6 June 2011) and the same has been incorporated in the revised benchmark analysis. Companies listed at least five years prior to investment decision have been included in the analysis. The complete list of companies with details of listing is given in the benchmark analysis spread sheets. 2. The risk free return rate and risk premium has also been evaluated at the time of investment decision, considering the operational lifetime (20 years) of the project activity. The revised benchmark calculation sheet is enclosed with relevant links for the data sources (BSE and moneycontrol.com for beta values, BSE for market rate of return, and RBI for risk free rate of return). The detailed explanation of the choice of parameters for the benchmark evaluation has been included in section B.5 of the PDD. The most conservative market rate or return based on three market indices has been selected as the market rate of	The available beta values of all companies for which data is available for at least five years prior to the decision making day has been considered. For validating this, DNV has prepared a list of 22 listed companies engaged in power generation / and / or distribution out of which scrip related data was available for previous 5 years for nine companies /60/. The beta values for all these companies have been sourced and using the standard formula /62/, the beta values have been unlevered. The average of the unlevered beta values has been considered for calculating the market return, which is found to be appropriate in the context of the project being an equity funded project. The market return for three indices (BSE 100, BSE 200, and BSE SENSEX) for which data was available for 20 years, the period of financial analysis, have been computed and the lowest among these have been considered to calculate the market risk premium. The risk free government security based return rate has been revised to indicate a rate which compares with the duration of financial analysis (20 years) /66/ and which was available at the time of making the investment decision. The data required for calculating the required return on equity are:

		return for the evaluation of the required rate of return on equity. The market rate of return for BSE 100, BSE 200, and BSE Sensex have been evaluated from June 1991 onwards, thus providing the market returns for 20.00 years which is comparable with the operational lifetime of the project activity (20 years). BSE 500 is not considered in the analysis since the index was launched in the year 1999 and BSE 500 data is available for only 10 years which is not comparable to the project life time of 20 years. Similarly, other market indices listed are not considered as the available data is not comparable to the project lifetime and/or because they are sectoral indices and not representative of the market. 3. The beta values have been un-levered and the benchmark has been revised based on un-levered beta values. As the project is 100% equity, there is no impact of re-levering the average un-levered beta value (does not result in any change in the beta value).	1. Risk free returns, which has been computed as the G-Sec returns of comparable period 2. Market returns for comparable period has been computed as the stock market returns of three market indices and the most conservative figure has been used. Difference between the risk-free returns and market return defines the risk premium which has been ensured to be very conservative. 3. Beta values of all represented companies have been sourced from reliable sources, the debt and equity of each such company considered and unlevered beta has been used ensuring distortion-free computing of values Thus, the values of all the input parameters for calculating the required return on equity on post-tax basis have been computed correctly / sourced properly. This has helped ensure establishment of a very conservative benchmark of 14% as the required post-tax return on equity. All issue have been addressed properly and hence CAR 9 is closed.
CAR 10 Sensitivity analysis has not been carried out to determine at what percentage of change of selected parameters does change in results	B.5.22 B.5.24 B.5.38	The extent of variation of key parameters which results in IRR reaching the benchmark has been included in section B.5 of the revised	The IRR has been revised to include tabulation of such per cent (%) values of tariff, generation, investment and O&M expenses, at which point the project

occur and the probability of such an occurrence.		PDD	financial indicator meets the benchmark. An analysis of the probability of occurrence of such events has also been included in the revised IRR and PDD. CAR 10 is closed.
CAR 11 A schematic metering diagram clearly indicating the unique ID of the WTG, feeder to which connected, and details of meters installed, has not been included in the PDD. Provide details in a table containing following details: 1. Unique ID of the WTG 2. Metering details, if any, in the transformer yard (690 V to 33 kV) 3. Connected feeder number, and installed meter details at the 33 kV /applicable sub-station and at 66 kV/220 kV sub-station Designate each meter and provide procedure adopted to calculate net amount of power exported based on above meter readings. It is observed that the monitoring practices adopted at the site are not fully covered under the monitoring plan provided in the webhosted PDD which needs to be revised to be in line with methodology requirements and the actual site practices.	B.7.1	Schematic metering diagram indicating unique WTG ID, feeder to which it is connected and the details of the meter installed have been included in the PDD. Details of feeders and meters corresponding to each WTG have been presented in tabular format in the revised PDD. The monitoring practices adopted at the site are included in the monitoring plan and the same has been incorporated in the PDD. Calculation of electricity supplied to the grid is explained in sections B.7.1 and B.7.2.	In section B.3 of the revised PDD, a schematic diagram with the required details has been provided. The monitoring procedure has been revised to include the various meters, recording of data, calculation of transmission losses and computing of net export to grid . DNV has verified all the details and confirmed that it meets the observations made during the site visit /72/. The revised procedure is in line with site practices and complies with the methodology requirements. CAR 11 is closed.
CAR 12 Documents in respect of local stakeholder consultation meeting have not been submitted; following documents are required: 1. Copy of notice informing the	E.1.1 E.1.2 E.1.4	The documents including notice informing stakeholders about the meeting, attendance sheet, minutes of meeting and list of concerns expressed and proposed action for stakeholder consultation meeting are	Copies of public notice, attendance sheet, and minutes of meeting, /20/ have been received and verified. The local stakeholder meeting and the consultation process meet the CDM requirements.

stakeholders about the proposed meeting 2. Copy of attendance sheet at the meeting 3. Copy of minutes of meeting 4. List of concerns expressed and proposed action		being submitted	CAR 12 is closed.
CL 1 Under section A.4.2 of the PDD which contains technical data in respect of the proposed equipment to be installed under the project activity, the documentary basis from where this data has been sourced is not referenced; also, data regarding the lifetime of the project is not provided.	B.5.12	The reference for technical specification and operating life time of the project is incorporated in the PDD 1. WTG technical specifications are enclosed 2. The operating life time is as per the technical specifications provided by the technology supplier (i.e. Suzlon). Technical specifications are enclosed	The reference for technical specifications /18/ has been received and verified /59/. The specifications provided including the technical lifetime are as per the specification sheet provided by the supplier company. CL 1 is closed.
CL 2 Copies of information sent to the EB, UNFCCC and NCDMA in accordance with the requirements of the "Guidance on the demonstration and assessment of prior consideration of the CDM" have not been provided along with copies of acknowledgment of receipt of such information.	B.5.6	Copies of information sent to the EB, UNFCCC and NCDMA in accordance with the requirements of the "Guidance on the demonstration and assessment of prior consideration of the CDM" are being provided along with copies of acknowledgment of receipt of such information	Copies of information sent to EB, UNFCCC, and NCDMA, and due acknowledgement by the respective agencies confirming receipt of information regarding the proposal to set up the project activity have been received /22//23/. These documents demonstrate compliance with the EB requirements of assessment of prior consideration. The UNFCCC link confirming registration of such intimations of CDM consideration has been verified /47/ . CL 2 is closed.
CL 3 The financial analysis presented is incomplete as no references have been provided for the assumptions indicated; also units for values indicated is not provided (for ex: Project	B.1.1 B.5.12 B.5.17 B.5.38	References for assumptions in the financial analysis have been incorporated and units for values of costs have been provided References for depreciation and applicable	Revised investment analysis spread sheet is received and verified. Necessary complete references and units for all have been provided. Incomplete references provided earlier have been replaced by complete and

cost). References provided in the PDD for depreciation and applicable IT rates, and tariff orders are incomplete.		IT rates and tariff orders are incorporated in the PDD	accessible reference links. CL 3 is closed.
CL 4 Regarding Common Practice analysis presented in the PDD, following needs to be completed: 1. Please provide copy of Indian Wind Power Directory (or the relevant pages) from which the data has been sourced. 2. Some of the web-links provided in the table are found to be not working. 3. Please provide justification for having considered only the State of Rajasthan for carrying out the analysis. 4. Please justify the cut-off date considered.	B.5.32 B.5.33 B.5.34 B.5.35 B.5.36 B.5.37	1. The copy of the Indian Wind Power Directory is enclosed. 2. The web links provide in the table have been corrected 3. Every state has a different regulatory regime, tariff structure, and investment climate for Wind power projects. Since the project activity is located in Rajasthan, common practice analysis is conducted considering wind power projects of similar capacity in the state of Rajasthan. 4. The data considered for the common practice analysis includes all projects commissioned up to March 2010. This was the latest data available at the time of investment decision.	Copy of Indian Wind Power Directory is received and the data sourced from it has been verified to be correct. Corrected URL have been checked and found working. The issue of considering the State of Rajasthan is found justified based on the reasoning provided as each state in India has its own ERCs, which in turn formulate the tariff structure and guidance values; these in turn dictate the investment conditions prevailing in the respective state and hence considering Rajasthan as the applicable geographic area for CPA is considered justified /45//51//54//56//57/. CL 4 is closed.
CL 5 The PLF report issued by Power & Energy Consultants has been reviewed; in this regard, the following needs to be attended: 1. The date on which the report was issued is not indicated and the relevance of the period for which the data is considered needs to be justified. 2. The basis for assumption of transmission loss has not been	B.5.16 B.6.4 B.6.5	The final third party PLF report is enclosed, and the PLF has been revised to 19.67%. 2. Power & Energy consultants had applied the transmission losses based on power evacuation system design in Rajasthan. However, the revised PLF report for the project is enclosed with evacuation losses considered at 4% in line with PPA. 3. The value provided at row no. 4 in the table under section 7 of the report has been	The revised PLF report for the project site is received and the tabulation of results has been verified. The transmission loss considered (4%) is based on the RERC guidance and the PPA. This has replaced the earlier considered 5% transmission loss. As a result the net utilization factor has been revised upwards to 19.67%. CL 5 is closed.

mentioned. 3. The value provided at sl no. 4 in the table under section 7 of the report needs to be demonstrated; has it been arrived at after taking the SD into account and if so, how?		arrived after taking Standard deviation (SD) into account. The calculation for the net energy generation given in row no. 4 is enclosed.	
CL 6 The start date has been reckoned as 15 June 2011 based on the earliest date of purchase orders placed for various equipment. However, we note that the contract for construction work is dated 15 March 2011 and the nature of the work ordered for is project specific. To clarify the compliance of the start date with the EB guideline of start date.	B.5.12 C.1.2	The date of signing purchase order is considered as the start date of project activity. The date of signing of purchase order is 15th June 2011, as per the contract and the same has been considered as start date for the project activity. PP would like to clarify that the date on the civil contract, 15th March 2011, is an error as the actual date of signing the contract is 15th June 2011. The same can be clarified by verifying the date of purchase of stamp paper which is 9th June 2011 and hence the contract cannot be signed on 15th March 2011.	DNV has verified the date of purchase of stamp paper and based on this has accepted the PP's explanation that the date indicated is a typographical error and 15 June 2011 is the start date of the project on which the purchase orders including the order for civil construction was placed signifying a serious commitment to the project. CL 6 is closed.
CL 7 1. The cash outflow for purchase of capital assets is not shown in the year it is reported to have occurred. 2. The relevance of indicating 2010-2011 in the spread sheet is not clear. 3. Please express all values in Millions only (not in lakhs and crores) 4. It is stated that the company is paying MAT. Please submit copies of latest annual report to evidence this.	B.5.12 B.5.13 B.5.38	1. The cash flow for purchase of capital assets is shown in the financial year 2011-12, the same year as they have occurred 2. The year 2010-11 has been removed from the financial analysis 3. All values are revised to INR Million 4. The copy of annual report is being submitted	1. The cash outflow for capital equipment purchase is accepted 2. 2010-11 has been removed 3. Values revised to Millions 4. Since the eligibility of Mat could not be arrived at by studying the annual report, PP subsequently submitted a certificate from a CA confirming eligibility for MAT /19/. Hence MAT eligibility is accepted. CL 7 is closed.

CL 8 The Indian DNA requires developers of large scale projects to spend at least 2% of CER revenues for Sustainable Development including society/community development. A monitorable action plan has to be included in the PDD.	B.7.13	The action plan to spend at least 2% of CER revenues for sustainable development has been included in Annex 5 of the PDD.	Annex 5 in the revised PDD /1/ is verified and confirmed to meet the host country's requirement of earmarking 2% CER revenue for sustainable development activities. CL 8 is closed.

Table 4 Forward action requests

Forward action request	Reference to Table 2	Response by project participants
No FAR has been identified.		

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APPENDIX B

CURRICULA VITAE OF THE VALIDATION TEAM MEMBERS

Seshan Ranganathan

Seshan Ranganathan, holds a Bachelor's Degree in Chemical Engineering and has done diploma course in Management and completed the graduate ship course in Industrial Engineering and has an overall working experience of around twenty six years. Prior to joining DNV has around twenty four 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 and pollution control activities including waste water treatment, project management, corporate planning, sales, logistics in fertilizer & petrochemical industry . With respect to the thermal power plant the job assignment included the monitoring of flue gas exit temperatures, excess air used efficiency of fuel additives, condition of boiler refractory, insulation of steam lines etc. The experience also includes 5 years in process design & engineering for chemical process industry.

He is qualified validator and verifier for CDM projects. He has completed the EMS lead auditor course. His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in areas of (a) 1.1 Thermal energy generation from fossil fuels and Biomass including thermal electricity from solar (b) 1.2 Energy generation from renewable energy sources (c) 2.2 Heat distribution (d) 5.1/11.1/12.1 Chemical Processes Industries and (e) 13.1 Waste handling and disposal.

Komaranapura Venkatachar Sudarshan

K.V. Sudarshan holds a bachelors' degree in Chemical Engineering and has nearly 35 years industrial experience in manufacture of aromatic chemicals, use and recovery of solvents, bulk drugs and pharmaceuticals, agro chemicals and plasticizers. This vast experience gave him the unique opportunity to be conversant with process selection, efficiency, and optimum utilization of all inputs including utilities. During his working in industries, he has had exposure to all facets of industrial chemical production, including handling of hazardous chemicals, solid and liquid effluents, waste and waste water treatment. A certified EMS auditor, he has worked as a consultant to design, establish, implement and operate Environmental and Occupational Health and Safety management systems at large industrial houses such as Raymond Textiles, Reliance Energy Industries, Saint Gobain Crystals and Detectors and at State Government undertakings.

He has been associated with CDM since 2005 and has worked as a validator and verifier for various CDM and VCS project activities, both in India and abroad. The project activities assessed by him include renewable energy generation projects, waste handling including community bio-gas projects, and energy efficiency projects in process industries. He is a qualified CDM Verifier and his qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in areas of (a) 1.2 Energy generation from renewable energy sources and (b) 5.1/11.1/12.1 Chemical Processes Industries and (e) 13.1 Waste handling and disposal.

M.V.Srinivasan

M.V.Srinivasan is a Fellow Member of the Institute of Chartered Accountants of India and also a Management Accountant from Chartered Institute of Management Accountants (UK). He has over 18 years of professional experience in Industry in areas of finance, accounting and systems and 5 years of professional experience in areas of internal and systems audit. He has also completed training on "carbon Market Fundamentals" administered by Decatur Professional Development, LLC. His qualification, training and experience demonstrate his sufficient sectoral competence as Financial Expert.

Govindarajulu, Murali

Holds a Bachelor's Degree in Chemical Engineering and has done a Short term diploma course in Management. Having an overall experience of around twelve 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 5 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.