Validation Report

Report for:

Serum Institute of India Limited

Validation of CDM project for

Wind power project at Jaibhim by SIIL

LRQA Reference	:	CDM-MUM-0061729 Version 02.8
Date	:	08/11/2012
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LRQA Business Assurance

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1 Executive Summary

Lloyd's Register Quality Assurance Limited has been contracted by Serum Institute of India Limited (SIIL), representing the project participants (PP), to undertake validation of the proposed project activity "Wind power project at Jaibhim by SIIL". The validation has been performed through a process of document review based on the project design document, Version 01.1 dated 27/04/2011 initially submitted for validation and the subsequent revisions, follow-up interviews with the stakeholders, resolution of outstanding issues and issuance of the validation report.

The project activity involves installation of 33.6MW (16nos.WTGs with each 2.1MW capacity). The PP has initially conceptualised for a project capacity of 37.8MW (18nos. of WTG with each 2.1MW capacity) but could only implement 16nos. of WTGs with each 2.1MW capacity due to the constraints faced by the PP in procurement of land for the installation and commissioning of two WTGs. The WTGs are of Suzlon make. The project activity is located in Jaibhim village, Dhule district of state of Maharashtra, India. The purpose of the project activity is to generate electricity from wind energy which is a renewable source and to be wheeled through the North East West North-East (NEWNE) grid for captive use. The generated electricity will displace equivalent electricity from the NEWNE grid which is primarily fed by fossil fuel sources and thus helping in reduction of GHG emissions.

The fulfilment of the requirements as set forth in Article 12 of the Kyoto Protocol of the United Nations Framework Convention on Climate Change (UNFCCC), the modalities and procedures for a CDM (CDM M&P) and relevant decisions of the Conference of the Parties, serving as meeting of the Parties to the Kyoto Protocol (COP/MOP) and the Executive Board of the CDM (CDM-EB) have been evaluated and conformance to the validation requirements were confirmed based on the given information. A risk based approach was taken to conduct the validation and corrective action requests (CARs) and clarifications (CLs) were raised for relevant actions by the PP.

The validation team has found through the validation process 9 CARs and 3 CLs. The PP has taken actions and submitted to LRQA the revised project design document and supporting evidence. The validation team is of the opinion that the proposed project activity as described in the project design document 09 dated 31/10/2012 meets all the relevant UNFCCC requirements for the CDM, as well as the host country's national requirements and if implemented as designed, is likely to achieve the emission reductions and contribute to the sustainable development of the host country. LRQA therefore requests the registration of "Wind power project at Jaibhim by SIIL" to the CDM Executive Board as a CDM project activity.

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Abbreviations

AY	Assessment Year
BE	Baseline emissions
CAGR	Compounded Annual Grown Rate
CAPM	Capital Asset Pricing Model
CARs	Corrective action requests
CDM	Clean development mechanism
CDM-EB	Executive board of clean development mechanism
CDM M&P	Modalities and procedures for a clean development mechanism
CDM VVM	CDM Validation and Verification Manual
CEA	Central Electricity Authority
CERs	Certified emission reductions
CLs	Clarification requests
COP/MOP	Conference of the Parties serving as meeting of the Parties to the Kyoto Protocol
CUF	Capacity Utilisation Factor
DNA	Designated national authority
DOE	Designated operational entity
EF	Emission factor
EIA	Environmental impacts assessment
EPC	Engineering, procurement and construction
ERPA	Emissions reduction purchase agreement
FAR	Forward action requests
FY	Financial Year (April to March)
GHG	Greenhouse gas
GSP	Global stakeholders' consultation process
INR	Indian Rupee
INR/KWh	Indian Rupee per Kilo watt hour
IPCC	Intergovernmental panel on climate change
IRR	Internal rate of return
IT	Income Tax
KP	Kyoto Protocol of the United Nations Framework Convention on Climate Change
KW / KWh	Kilowatt / Kilowatt hour
LE	Leakage emissions
LoA	Letter of approval
LR	Lloyd's Register
LRQA	Lloyd's Register Quality Assurance Limited
MEDA	Maharashtra Energy Development Agency
MERC	Maharashtra Electricity Regulatory Commission
MoEF	Ministry of Environment and Forests
MSEDCL	Maharashtra State Electricity Distribution Company Ltd
MW / MWh	Mega watt / Mega watt hour
NCDMA	National CDM Authority
NCV	Net calorific value
NEWNE	North East West North East
NGO	Non governmental organization
ODA	Official development aid
O&M	Operation and Maintenance
PDD	Project design document
PE	Project emissions
PLF	Plant Load Factor
PP	Project participant

RBI	Reserve Bank of India
RfR	Request for Registration
SI	International System of Units
SIIL	Serum Institute of India Limited
tCO_2e	Tonnes of carbon dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard
WTG	Wind Turbine Generator
YTM	Yield to Maturity

2 Introduction

The project participant (PP), Serum Institute of India Limited has contracted with Lloyd's Register Quality Assurance Limited (LRQA) to undertake validation of the proposed project activity "Wind power project at Jaibhim by SIIL". This report summarizes the findings of the validation process that has been conducted on the validation requirements of the CDM.

The validation has been undertaken by the team formed of the qualified personnel of LRQA as follows:

Names	LRQA entities	Role
Shanbhag Shubha	LRQA Ltd. India	Team Leader[1] CDM Lead Validator CDM programme expert Sector Expert
Ponnada Rama N Rao	LRQA Ltd. India	Team Member, Team Leader CDM Lead Validator CDM programme expert
B Rampradap	LRQA Ltd. India	Sector Expert to the team (in absence of Shubha)
Imran Ustad	LRQA Ltd. India	Technical Reviewer Sector Expert
Michiaki Chiba	LRQA Ltd	Decision maker for initial submission to UNFCCC
Ketan Deshmukh	LRQA Ltd	Decision maker for incompleteness check submission to UNFCCC

Personnel being engaged in a CDM project validation are qualified based on the established procedures of LRQA to assure the resource requirements satisfy all the requirements of competence criteria for an AE/DOE under CDM (CDM-Accreditation Standard version 04). LRQA is designated as an operational entity and holds the full responsibility of decision-making regarding the validation, in line with the accreditation requirements of the CDM-EB. The certificate of appointment of the team personnel is attached to this report.

[1] Shubha Shanbhag participated in the validation team as team leader till 29/03/2012. Ponnada Rama N Rao who earlier participated in team member capacity led the team from 29/03/2012 onwards in absence of Shubha Shanbhag.

2.1 Objective

Validation is the process of an independent third party evaluation of a project activity on the basis of the PDD, against the requirements of the CDM as set out in Article 12 of the Kyoto Protocol, the CDM M&P, the present annex, subsequent decisions made by the COP/MOP and CDM-EB, and other rules applicable to the proposed project activity including the host country's legislation and its specific requirements for sustainable development. The validation follows the requirements of the current version of the CDM validation and verification manual (CDM VVM) to ensure the quality and consistency of the validation work and the report.

2.2 Scope

The scope of validation is an independent and objective review of the project design. Review of the PDD is conducted against the requirements of the Kyoto Protocol, the CDM M&P and relevant decisions of the COP/MOP and the CDM-EB. LRQA follows a risk-based approach in the validation focusing on the identification of significant risks for project implementation and generation of CERs. Validation is not meant to provide any consulting towards the PP, however, the corrective actions requests (CARs) and clarifications (CLs) might provide input for improvement of the project design. A validation conclusion shall become final subject to the decision maker's review by LRQA Ltd.

2.3 GHG Project Description

Serum Institute of India Limited (SIIL) is a manufacturer of immuno-biologicals including vaccines in India. SIIL was incorporated on 22/05/1984. The project activity involves installation of 33.6MW (16nos.WTGs with each 2.1MW capacity). The PP has initially conceptualised for a project capacity of 37.8MW (18nos. of WTG with each 2.1MW capacity) but could only implement 16nos. of WTGs with each 2.1MW capacity due to the constraints faced by the PP in procurement of land for the installation and commissioning of two WTGs (JAI-01, JAI-06). The WTGs are of Suzlon make. The project activity is located in Jaibhim village, Dhule district of state of Maharashtra, India. The geographical location (including village names) and co-ordinates of the project activity WTGs are as below.

Location No.	Village	District	Latitude	Longitude	Gut no.
JAI-02	Runmali	Dhule	21^0 7' 48"	74^0 16' 3"	95/1
JAI-03	Runmali	Dhule	21^0 7' 36"	74^0 16' 4"	79/3
JAI-04	Vaskhedi	Dhule	21^0 7' 20"	74^0 15' 58"	87
JAI-05	Jaitane	Dhule	21^0 7' 41"	74^0 18' 15"	129/2
JAI-07	Runmali	Dhule	21^0 8' 16"	74^0 18' 24"	46
JAI-08	Vajdare	Dhule	21^0 8' 43"	74^0 18' 31"	109
JAI-09	Akhade	Dhule	21^0 7' 54"	74^0 20' 54"	122
JAI-11	Jaitane	Dhule	21^0 7' 24"	74^0 20' 49"	582/3 & 582/4
JAI-18	Shivajinagar	Dhule	21^0 5' 42"	74^0 20' 15"	124/1
JAI-19	Shivajinagar	Dhule	21^0 5' 26"	74^0 20' 11"	116
JAI-21	Shivajinagar	Dhule	21^0 5' 20"	74^0 19' 39"	124/3
JAI-22	Shivajinagar	Dhule	21^0 5' 29"	74^0 18' 59"	386/3 & 386/4
JAI-23	Bhamer	Dhule	21^0 5' 41"	74^0 19' 11"	391/1
JAI-27	Bhamer	Dhule	21^0 5' 10"	74^0 18' 30"	370
JAI-28	Bhamer	Dhule	21^0 5' 0"	74^0 17' 45"	113 & 313/1

JAI-29	Bhamer	Dhule	21^0 5' 17"	74^0 17' 39"	315/2

The site locations have been confirmed through commissioning certificates and through site visit interaction.

The purpose of the project activity is to generate electricity from wind energy which is a renewable source and to be wheeled through the North East West North-East (NEWNE) grid for captive use at PP's industrial facility located in Hadapsar, Pune. The generated electricity will displace equivalent electricity from the NEWNE grid which is primarily fed by fossil fuel sources and thus helping in reduction of GHG emissions.

The estimated GHG emission reductions are 52,898 tCO_2e per annum during the fixed crediting period of 10 years. The project activity is categorised in the sectoral scope 1-Energy Industries (renewable/non renewable sources).

3 Methodology

3.1 Review of documents

The validation is performed primarily based on the review of the project design document (PDD) and the other supporting documentation.

The PDD Version 01.1 dated 27/04/2011 was initially reviewed. LRQA requested the PP to present supporting information and documents relating to the project design and such additional information and documents were also reviewed by LRQA.

Through the process of the validation, the PDD and the supporting documents of the same were evaluated to confirm the actions taken by the PP to the CARs and CLs issued by LRQA. The documents reviewed by LRQA are listed in Appendix B. LRQA reviewed the final version of the PDD Version 09 dated 31/10/2012 to confirm that all changes agreed had been incorporated.

3.2 Site Visit and Follow-up interviews

A site visit and follow-up interviews with the stakeholders were conducted as detailed in the schedule as below:

Date	Location/ Address	Party Interviewed	Subjects Covered	Team Members on Site
22/06/2011	Serum Institute of India (PP)'s corporate office, Pune, Maharashtra.	PP's Top Management	1. Investment and sensitivity analysis 2. Benchmark selection 3. Consideration of CDM revenues 4. Decision making process 5. Funding for project activity	Shubha Shanbhag
29/06/2011	Project site at Dhule, Maharashtra	Representatives from Technology supplier	1. Project boundary issues 2. Projects contribution to sustainable development 3. Performance of WTGs (Power generation, grid availability, PLF, Machine availability,	Shubha Shanbhag

			losses etc.) 4. Physical identification of WTG based on unique identification number 5. Procedures for monitoring & reporting, QA/QC systems, system of training people. 6. Legal requirements including consents and approvals necessary for the project. 7. Electricity metering provision (Joint meter reading, if any), Calibration schedule of meters 8. Institutional arrangement of data collection and archiving 9. Record keeping – daily production report, operation log 10. Provisions for internal audits 11. Emergency preparedness	
29/06/2011	Sub-station	Representatives from MSEDCL	1. Metering Provision 2. Calibration schedule 3. WTG performance 4. Grid availability for power evacuation 5. Payment of electricity supplied by WTG owners – Delays, Penalties 6. Allocation of Unique Identification numbers of WTG and related evidence 7. Views on project activity	Shubha Shanbhag
29/06/2011	Project site at Dhule Maharashtra	Local stakeholders and PP representatives	1. Discussion on local stakeholder consultation process, land ownership, land sale deeds, transaction procedures 2. Intimation process for the meeting to local stakeholders' 3. Representation by stakeholders in stakeholders' consultation meeting 4. Minutes of meeting – Comments, action taken	Shubha Shanbhag

			5. Employment of local skilled and unskilled people 6. Views on the project activity 7. Any other issues of stakeholders' 8. Discussion on environmental impact assessment of the project if any	
29/06/2011	Jaibhim (Dhule)	Interview of the project consultant (E & Y Representative)	1. Investment and sensitivity analysis 2. Benchmark selection 3. Monitoring plan 4. AIR Related evidences 5. Discussion on GSP comments	Shubha Shanbhag
29/06/2011	Jaibhim (Dhule)	Interview of the Senior Management/ PP representatives	1. Selection of technology 2. Selection of site 3. Stakeholders' consultation related discussions 4. Discussion on GSP comments 5. Any unresolved issue from site visit	Shubha Shanbhag

A full list of persons interviewed is shown in Appendix C.

For details of all the findings of the desk review and site visit, please refer to the Validation Protocol and Findings in Appendix F.

3.3 Resolution of clarification and corrective action requests

LRQA applies the risk based approach aimed at focusing on high risk issues to the validation results while not omitting any part of the mandatory processes.

Findings identified in the process are indicated under the titles corrective action requests (CARs) and clarification requests (CLs) and forward action requests (FARs). CARs and CLs require the PP to take relevant actions. Criteria for judging items as CAR or CL are as follows:

Corrective action request (CAR):

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

Clarification request (CL):

- information is insufficient or not sufficiently clear to determine whether the applicable CDM requirements have been met.

FARs are to be raised to highlight issues related to project implementation that require review during the first verification of the project activity. FARs do not relate to CDM requirements for registration.

CARs and CLs are to be resolved or closed out if the PP modifies the project design, rectifies the PDD or provides adequate additional explanations or evidence that

satisfies the concerns. If this is not completed, the project activity cannot be recommended for registration to the CDM Executive Board.

For details of the nature of the issues raised, the nature of the responses provided, the means of validation of such responses and the resulting changes in the PDD or supporting annexes please refer to the Validation Protocol and Findings in appendix F.

3.4 Internal quality control

A technical review by a qualified person independent from the validation team and a review by an authorized decision maker were conducted before the submission of the validation report to the PP and before requesting the registration of the project activity.

4 Validation protocol and conclusions

This section provides an overview of the validation activities undertaken by LRQA in order to arrive at the final validation conclusions and opinion. It includes general conclusions based on the Clean Development Mechanism Validation and Verification Manual Version 01.2. Further details in relation to each element of the protocol and each finding are shown in the Validation Protocol and Findings – Appendix F.

The protocol is structured based on the main validation requirements as follows:

- Approval by the Parties involved
- Participation requirements
- Project design document
- Project description
- Baseline and monitoring methodology
  - Applicability of the selected methodology
  - Project boundary
  - Baseline identification
  - Algorithms and/or formula used to determine emission reductions
- Additionality of a project activity
  - Prior consideration of the CDM
  - Identification of alternatives
  - Investment analysis
  - Barrier analysis
  - Common practice analysis
- Monitoring plan
- Local stakeholder consultation
- Environmental impacts.

4.1 Approval

A CDM project shall be approved by the Parties involved.

The host Party of the proposed project is India. India ratified the Kyoto Protocol on 26/08/2002. The Designated National Authority (DNA) is National Clean Development Mechanism Authority (NCDMA) established in the Ministry of Environment and Forests (MoEF), Government of India. A letter from approval from the host country dated 10/04/2012 having reference number 4/22/2011-CCC has been received. This letter of approval confirms the contribution of the project activity “Wind power project at Jaibhim by SIIL” to the sustainable development of India.

The project has currently been proposed as a unilateral CDM project and the Annex I Party has not yet been identified. In line with the provision of paragraph 57 of the 18th

meeting of the CDM-EB, registration of a project activity can take place without an Annex I party being involved at the stage of registration.

For details relating to this section, please refer to the Validation Protocol in Appendix F.

4.2 Participation requirements

Serum Institute of India Limited is a private entity having its registered office in India.

The contact details of the PP are correctly provided in Annex 1 of the PDD.

Participation in the project activity of the PP has been authorized, as confirmed in the LoA issued by the DNA of the Party concerned. The team confirmed that no entities other than the authorized entities are indicated as project participant in the PDD.

For details relating to this section, please refer to the Validation Protocol in Appendix F.

4.3 Project design document

The PDD was checked and confirmed as complete against the Guidelines for completing the project design document (CDM-PDD) and the proposed new baseline and monitoring methodologies (CDM-NM) referring to the latest version applicable to the validation.

A valid form of the CDM-PDD is used that is the current form as available on the CDM website.

For details relating to this section, please refer to the Validation Protocol in Appendix F.

4.4 Project description

The project activity involves the 33.6 MW wind power project involving 16 WTGs of 2.1 MW capacity each. The PP had initially conceptualised for implementing 18 WTGs of 2.1 MW each, but implemented a total capacity of 33.6 MW with 16 WTGs of 2.1 MW each, due to the constraints faced by the PP in procurement of land for the installation and commissioning of two WTGs (JAI-01, JAI-06)

The WTGs are of Suzlon make. The project activity is located in Jaibhim village, Dhule district of state of Maharashtra, India. The geographical location (including village names) and co-ordinates of the project activity WTGs are as below.

Location No.	Village	District	Latitude	Longitude	Gut no.[2]
JAI-02	Runmali	Dhule	21^0 7' 48"	74^0 16' 3"	95/1
JAI-03	Runmali	Dhule	21^0 7' 36"	74^0 16' 4"	79/3
JAI-04	Vaskhedi	Dhule	21^0 7' 20"	74^0 15' 58"	87
JAI-05	Jaitane	Dhule	21^0 7' 41"	74^0 18' 15"	129/2
JAI-07	Runmali	Dhule	21^0 8' 16"	74^0 18' 24"	46
JAI-08	Vajdare	Dhule	21^0 8' 43"	74^0 18' 31"	109
JAI-09	Akhade	Dhule	21^0 7' 54"	74^0 20' 54"	122
JAI-11	Jaitane	Dhule	21^0 7' 24"	74^0 20' 49"	582/3 &

[2] Gut number is a number specified by Government to specify land demarcation.

					582/4
JAI-18	Shivajinagar	Dhule	21^0 5' 42"	74^0 20' 15"	124/1
JAI-19	Shivajinagar	Dhule	21^0 5' 26"	74^0 20' 11"	116
JAI-21	Shivajinagar	Dhule	21^0 5' 20"	74^0 19' 39"	124/3
JAI-22	Shivajinagar	Dhule	21^0 5' 29"	74^0 18' 59"	386/3 & 386/4
JAI-23	Bhamer	Dhule	21^0 5' 41"	74^0 19' 11"	391/1
JAI-27	Bhamer	Dhule	21^0 5' 10"	74^0 18' 30"	370
JAI-28	Bhamer	Dhule	21^0 5' 0"	74^0 17' 45"	113 & 313/1
JAI-29	Bhamer	Dhule	21^0 5' 17"	74^0 17' 39"	315/2

During the process of validation, LRQA confirmed the capacity, unique identification of the project activity, estimated power generation, arrangement for the evacuation of the electricity generated, technical specifications, date of commissioning, arrangements for O & M and necessary clearances for setting up the project activity. The list of documents reviewed during the course of validation was presented under Appendix B.

The locations of the WTGs and commissioning details have been confirmed through the commissioning certificates as follows;

Location No.	Village	District	Commissioning Certificate dated	Commissioned on	Gut no.
JAI-02	Runmali	Dhule	02/04/2011	19/03/2011	95/1
JAI-03	Runmali	Dhule	02/04/2011	19/03/2011	79/3
JAI-04	Vaskhedi	Dhule	07/09/2011	06/09/2011	87
JAI-05	Jaitane	Dhule	18/03/2011	15/03/2011	129/2
JAI-07	Runmali	Dhule	18/03/2011	15/03/2011	46
JAI-08	Vajdare	Dhule	18/03/2011	15/03/2011	109
JAI-09	Akhade	Dhule	02/04/2011	31/03/2011	122
JAI-11	Jaitane	Dhule	02/04/2011	31/03/2011	582/3 & 582/4
JAI-18	Shivajinagar	Dhule	18/03/2011	11/03/2011	124/1
JAI-19	Shivajinagar	Dhule	02/04/2011	19/03/2011	116
JAI-21	Shivajinagar	Dhule	18/03/2011	11/03/2011	124/3
JAI-22	Shivajinagar	Dhule	02/04/2011	19/03/2011	386/3 & 386/4
JAI-23	Bhamer	Dhule	02/04/2011	19/03/2011	391/1
JAI-27	Bhamer	Dhule	18/03/2011	12/03/2011	370
JAI-28	Bhamer	Dhule	18/03/2011	11/03/2011	113 & 313/1
JAI-29	Bhamer	Dhule	18/03/2011	12/03/2011	315/2

The purpose of the project activity is to generate electricity from wind energy which is a renewable source and to be wheeled to substation through a 33kV overhead line (North East West North-East (NEWNE) Grid) for captive use (self use) at PP's industrial facility located in Hadapsar, Pune. The net electricity supplied by the project activity to the grid (at the substation point) shall be adjusted from the PP's electricity consumption at the consumption end at the industrial facility of the PP located at Pune. LRQA confirmed that the PP is wheeling the generated electricity for captive consumption (self use) through sample credit notes and electricity bills of the industrial facility.

The generated electricity will displace equivalent electricity from the NEWNE grid which is primarily fed by fossil fuel sources and thus helping in reduction of GHG emissions.

The project activity involves installation of 33.6MW (16nos.WTGs with each 2.1MW capacity). The technical details of the WTG provided in the PDD were confirmed from the technical specifications provided by the WTG supplier. In conforming the details, the parameters with respect of the rotor diameter, rotor speed, rated speed, hub height and the expected annual power generation were given special emphasis. The validation team confirms that the Wind Turbine Generator (WTG) of Suzlon make having capacity of 2.1MW is based on a proven technology[3] used elsewhere in the host country for electricity generation using wind energy. The model S-88 of Suzlon has been listed by "Centre for Wind Energy Technology[4]", Government of India, confirming the availability of type certificate.

The PP has estimated a net generation of 3600MWh/WTG/annum (3.6 million kWh per WTG per annum) for the project activity as provided by the WTG supplier. The supplier quotation dated 12/03/2010 is available at the time of decision making. The PP has also conducted a third party assessment study (techno commercial evaluation) for determining PLF by Consolidated Energy Consultants Limited (CECL). The third party assessment of techno commercial evaluation study is in accordance with the paragraph 3(b), Annex 11 of the report of 48th meeting of the CDM EB "Guidelines for the reporting and validation of plant load factors" (Version 01). The third party report has estimated a net generation of 3,485 MWh/WTG/annum with a PLF of 18.94%. The PP has considered higher net generation of 3600 MWh/WTG/annum based on the supplier quotation for demonstration of additionality for the project activity and a lower PLF of 18.94% (3485MWh/WTG/annum) for the estimation of ex-ante emissions reduction is conservative. LRQA deems this approach as appropriate and reasonable.

The estimated GHG emission reductions are 52,898 tCO_2e per annum during the fixed crediting period of 10 years. The project activity is categorised in the sectoral scope 1-Energy Industries (renewable/non renewable sources).

The project description was validated by document review including PDD, review of offer letters from technology supplier, purchase orders, commissioning certificates, publicly available information about the technology supplier, interview, and the on site visit.
LRQA confirms that the project description included in the PDD is accurate and complete. This description provides the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation.

Sustainable development
The host Party's DNA confirmed the contribution of the project activity to the sustainable development of the host Party.

For details relating to this section, please refer to the Validation Protocol in Appendix F.

4.5 Baseline and monitoring methodology

Applicability of the selected methodology to the project activity
The project activity applied the approved baseline and monitoring methodologies:

[3] The Suzlon technology is well known and proven in the wind power industry refer link below http://www.cwet.tn.nic.in/Docu/RLMM_List_01_2011.pdf

[4] The Suzlon technology is well known and proven in the wind power industry refer link below http://www.cwet.tn.nic.in/Docu/RLMM_List_01_2011.pdf

ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”. ACM0002 Version 12.3.0 is valid from 17/09/2010 to 10/05/2012(Requests for registration can be submitted until 11/01/2013).

LRQA confirms unambiguously that the selected methodology is applicable to this project activity. The project applicability was confirmed against each condition in the approved methodology selected. Appendix F includes the list of each applicability condition, the steps taken to validate each one and the conclusions about its applicability to the proposed project activity.

For details relating to this section, please refer to the Validation Protocol in Appendix F.

Project boundary

The project boundary has been validated through document review of the Maharashtra Energy Development Agency (MEDA) infrastructure clearance and commissioning clearance for the WTGs, commissioning certificates as listed in Appendix B, through interview and field survey. This information was substantiated via cross check with CO_2 baseline database Version 6.0 which is the latest version available at the time of submission of the PDD for validation. Through the processes taken, the validation team confirmed that the identified project boundary, the selected sources and the gases were justified for the project activity and they meet the requirements of the approved methodology.

For details of whether any discrepancy was identified, and the processes taken, for example, issued CAR or requested clarification of, revision to or deviation from the approved methodology for approval by the CDM-EB before completion of the validation, please refer to the Validation Protocol in Appendix F.

Baseline identification

The baseline scenario identified in the PDD has been assessed against the requirements in the approved methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” Version 12.3.0. LRQA can confirm that the procedure included in this methodology to identify the most reasonable baseline scenario, has been correctly applied.

The steps taken to assess the baseline identification are described in the Validation protocol in Appendix F.

LRQA confirms that:

- All the assumptions and data used by the project participants are listed in the PDD, including their references and sources;
- All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;
- Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;
- Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD;
- The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.

Algorithms and/or formula used to determine emission reductions

LRQA has confirmed that the steps taken and the equations applied to calculate baseline emissions and emission reductions comply with the requirements of the approved methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” Version 12.3.0.

The steps taken to assess the algorithms and/or formula used to determine emission reductions are described in the Validation protocol in Appendix F.

LRQA confirms that:

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

4.6 Additionality of a project activity

The project additionality was demonstrated by the PP using the "Tool for demonstration and assessment of Additionality" Version 06.0.0.
The PP has presented the financial unattractiveness of the project activity through investment barrier for which the PP has used benchmark analysis. PP has chosen equity IRR as a financial indicator, as the project activity is funded through 100% equity. The equity IRR has been an appropriate benchmark, as per the Guidelines on the assessment of investment analysis, Version 05, paragraph 12, Annex 5, EB62. The required /expected returns on equity have been arrived at by using the Capital Asset Pricing Model (CAPM).
The steps taken to assess the investment analysis are described in the Validation protocol in Appendix F.

Prior consideration of CDM

The start date for the project activity is 05/08/2010, the earliest date on which the agreement was signed between Serum Institute of India Limited and technology supplier (Suzlon) and thereby the PP has committed to expenditures related to implementation of the project. LRQA has validated the start date in accordance with Glossary of CDM terms Version 05, through the review of agreement between the technology supplier and the PP, commissioning certificates and interview with the senior management of the PP organisation.

The project activity started after 2 August 2008. The PP has informed the Host Party designated national authority (DNA) and the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status. Such notification was made to UNFCCC secretariat and to NCDMA on 01/07/2010, which is even before the start date hence meeting the requirement of communication within six months of the project activity start date (i.e.05/08/2010). Through the process of validation, LRQA confirms that the proposed project activity complies with the requirement of the Guidelines on the demonstration and assessment of prior consideration of the CDM Version 04.

The steps taken to assess the prior serious consideration of the CDM are described in the Validation protocol in Appendix F.

Identification of alternatives

The list in the Validation Protocol – Appendix F section 6.b, shows the alternatives given in the PDD, and clearly states how LRQA has validated whether these alternatives are credible and complete.

It is the opinion of LRQA that the list of alternatives provided in the PDD are credible and complete considering the technology and circumstances of the proposed Project activity as well as the investor business.

Investment analysis

The Investment analysis option has been used to demonstrate the additionality of the proposed project activity. LRQA confirms that the PDD provides evidence that this project activity would not be economically or financially feasible, without the revenue from the sale of CERs.

The PP has shown that the project activity is additional by demonstrating that the financial returns of the proposed CDM project activity would be insufficient to justify the required investment.

For assessing the additionality of this project activity LRQA has complied with the latest version of the "Guidance on the Assessment of Investment Analysis" as provided by the CDM Executive Board and with other relevant guidance including the latest guidelines on plant load factors "Guidelines for the reporting and validation of plant load factors".

PP had presented the unprotected spreadsheet versions of the investment analysis, having readable formulae. LRQA could confirm that the investment analysis is presented in a transparent manner, to the extent that the reader can reproduce the results. The equity IRR has been calculated as 10.71%. The PP has used Reserve Bank of India's Yield to Maturity rate of 8.2672% as risk free rate of return, which is appropriate at the time of decision making. Equity beta value has been taken as the average of the 3 year beta values of nine companies listed in BSE-500, and calculated as 1.0801. The market returns have been calculated as 18.90% using Compound Annual Growth Rate (CAGR) for the BSE-500 since its base year (1999) to the time of decision making.The benchmark IRR for the project has been calculated as 19.75% using Capital Asset Pricing Model (CAPM).

For details about the validation of the parameters used in the financial calculations and assessment of the benchmark applied, please refer to the Validation protocol in Appendix F.

LRQA confirms that the underlying assumptions for the investment analysis are appropriate and that the financial calculations are correct.

Common practice analysis

LRQA confirms that the proposed CDM project activity is not widely observed and commonly carried out in the host country, India.

For details about the validation of the geographical scope, the assessment of the existence of similar projects and also the assessment of the essential distinctions between the proposed project activity and any similar projects, please refer to the Validation protocol in Appendix F.

4.7 Monitoring Plan

The PDD includes a Monitoring Plan based on the approved monitoring methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" Version 12.3.0.

LRQA confirms that the Monitoring Plan described in the PDD complies with the

requirements in the Monitoring Methodology and that the PP will be able to apply this Monitoring Plan following the monitoring arrangements described in it.

For details about the validation of the Monitoring Plan, please refer to the Validation protocol in Appendix F.

4.8 Local stakeholder consultation

The PP invited local stakeholders to comment on the proposed project activity on the 26/10/2010 before the publication of the PDD on the UNFCCC website. The local stakeholder consultation meeting was held in Jaibhim village and the following persons and entities attended this meeting:

1. Yuvraj Satish	Farmer, Jaitane village
2. Uttam Eka Khande	Farmer, Navagaon village
3. Bhagvan Lakshman	Farmer, Navagaon village
4. Nana Lahan Goykar	Farmer, Navagaon village
5. Bhaburao Lakshman B	Farmer, Jaitane village
6. Dayaram Ratan K	Farmer, Jaitane village
7. Santosh Uttam Maki	Farmer, Jaitane village
8. Pandit Bhajrang B	Farmer, Bhamer village
9. Satish Anil G	Farmer, Jaibhim village
10. Ganpath H Goswami	Farmer, Jaitane village
11. T Raghunath Pipale	Farmer, Jaibhim village
12. B S Bhende	Farmer, Shivajinagar village
13. Vilas Lalchand Sonewade	Farmer, Shivajinagar village
14. B Ganeshlal Jaiswal	Farmer, Shivajinagar village
15. Jitendra Ganeshlal Jaiswal	Farmer, Shivajinagar village
16. Yogesh Namdev Maki	Farmer, Bhamer village
17. Ramesh Jagannath Ch	Farmer, Jaitane village
18. B Marner	Farmer, Bhamer village
19. Dilip M Patil	Farmer, Khudane village
20. Gangadhar B	Farmer, Khudane village
21. Gangadhar Vani	Farmer, Nijampur village
22. Manoj Sonewade	Farmer, Bhamer village
23. Bhonsale J W	Deputy Manager, Suzlon
24. Bharat Naik	Assistant Manager,Suzlon
25. Kaushik patel	Manager, Suzlon
26. Himanshu Kulkarni	Senior Executive, Suzlon
27. Chetan Mehra	Deputy Manager, Suzlon
28. Rajendra Tiwari	Project Manager, SIIL
29. Santosh Tupe	Manager, Projects, SIIL
30. Vinod Kakule	Assistant Manager, Projects, SIIL

31. Sanjay Tripathi	Deputy Manager, Environment, SIIL
32. Joseph S C	Manager, Commercial, SIIL
33. Manoj S B	Senior Executive, Legal, SIIL
34. Prasanna S	Senior Manager, Marketing, SIIL
35. Vijay Joshi	Executive, SIIL
36. S S Bhonsale	Field Officer, SIIL
37. Avinash R Nalwade	Field Officer, SIIL

LRQA confirms that the stakeholder consultation process targeted stakeholders and was appropriate for identifying stakeholders' opinions about the project and collecting their views.

For details about the steps taken to assess the adequacy of the Stakeholder consultation, please refer to the Validation protocol in Appendix F.

4.9 Environmental impacts

LRQA has confirmed that as per the host country regulations the project activity does not require Environmental Impact Assessment (EIA) to be conducted.

For details about the document review and determination of whether the PP has undertaken the analysis of environmental impacts, please refer to the Validation protocol in Appendix F.

4.10 Summary of Changes

Significant changes made to the original PDD published for Global Stakeholder Consultation Process are summarised below. The PDD Version 01.1 dated 27/04/2011 was modified and several changes occurred due to the result of validation process. The PDD Version 09 dated 31/10/2012 includes all these changes.

For details about the results of the responses to CARs and CLs, discussions on revisions to project documentation and the detailed changes to the PDD coming from the validation process, please refer to the Validation Findings Log in the Validation Protocol in Appendix F.

1. Change in IRR value and Benchmark value (Refer to closure of CAR03, CAR04 and CL02)
2. Change in emission reduction (Refer to closure of CAR06)
3. Change in the capacity of the project (no. of WTGs and location) (Refer to closure of CL01 and CL03)
4. Change in the common practice conditions (Refer to the closure of CAR09)

5 Comments by parties, stakeholders and NGOs

In line with the requirement of the Procedures for Processing and Reporting on Validation of CDM project activities, the PDD is to be made publicly available for 30 days subject to confidentiality provisions agreed with the PP, to enable comments to be received from Parties, stakeholders, and UNFCCC accredited NGOs on the validation and registration requirements.

The PDD was made publicly available in line with the requirements of the procedure for the period of 04 May 11 - 02 Jun 11 as per http://cdm.unfccc.int/Projects/Validation/DB/XXYJMA0QDZ2RRLBZIVGFF0ZFKQ3VPP/view.html

Three comments were received during the period and the comments were made publicly available as per http://cdm.unfccc.int/Projects/Validation/DB/XXYJMA0QDZ2RRLBZIVGFF0ZFKQ3VPP/view.html

The comments received have been taken into consideration as detailed in Appendix D of this report.

6 Validation Opinion

LRQA has undertaken the validation of the proposed project activity "Wind power project at Jaibhim by SIIL" based on the requirements of CDM as set out in Article 12 of the Kyoto Protocol, the CDM M&P, the present annex, subsequent decisions made by the COP/MOP and CDM-EB, and the other rules applicable to the proposed project activity including the host country's legislation and its specific requirements for sustainable development.

The project activity involves the 33.6 MW wind power project involving 16 WTGs of 2.1 MW capacity each. The PP has initially conceptualised for 18nos.of 2.1 MW each, but implemented the project with a capacity of 33.6 MW with 16nos. of 2.1 MW each due to the availability of financial resources. The WTGs are of Suzlon make. The project activity is located in Jaibhim village, Dhule district of state of Maharashtra, India. The purpose of the project activity is to generate electricity from wind energy which is a renewable source and to be wheeled through the North East West North-East (NEWNE) grid for captive use. The generated electricity will displace equivalent electricity from the NEWNE grid which is primarily fed by fossil fuel sources and thus helping in reduction of GHG emissions.

In order to arrive at the final validation conclusions and opinion, LRQA carried out review of project documents, assessment of compliance with and application of the approved baseline and monitoring methodology as well as the approved methodological tools, field survey and physical on site assessment of the project site and interviewing the local stakeholders. There was no project component or issues excluded from the validation.

Through the validation process, the validation team identified 9 CARs and 3 CLs. The PP has taken action on the raised issues and submitted to LRQA the revised PDD and other supporting evidence LRQA reviewed the response and actions taken by the PP, and all the findings were closed through the process.

The validation team is of the opinion that the proposed project activity conforms to all the relevant UNFCCC requirements for the CDM as well as the host country's national requirements, and if implemented as designed, is likely to achieve the validated emission reductions of 52,898 tCO_2 and contribute to the sustainable development of the host country. Therefore LRQA requests the registration of "Wind power project at Jaibhim by SIIL" to the CDM Executive Board as a CDM project activity.

Decision Maker

Ketan Deshmukh
Date: 27 November 2012

7 Appendices

7.1 Appendix A: Letter of approval for the project by the host and investing country DNA

Letter of Approval from the Ministry of Environment and Forests (MoEF), Government of India (Host Country DNA) No. 4/22/2011-CCC dated 10/04/2012.

7.2 Appendix B: List of documents reviewed

Category A documents (documents prepared by the PP)

1. Project Design Document Version 01 dated 01/04/2011, Version 01.1 dated 27/04/2011 (PDD posted for GSP), Version 02 dated 13/08/2011, Version 03 dated 18/10/2011, Version 04 dated 06/03/2012, Version 05 dated 27/04/2012, Version 06 dated 21/05/2012, Version 07 dated 23/05/2012, Version 08 dated 12/06/2012
2. Investment analysis/Emission Reduction Calculation sheet Version 01, dated 01/04/2011, Version 02, dated 13/08/2011, Version 03, dated 18/10/2011, Version 04 dated 06/03/2012, Version 05 dated 27/04/2012, Version 06 dated 21/05/2012 and Version 07 dated 23/05/2012
3. Certificate of incorporation issued by Registrar of Maharashtra dated 22/05/1984
4. Electricity bills for the year 2007-08, 2008-09, 2009-10
5. Offer from Suzlon India Private Limited dated 12/03/2010
6. Board approval for the project activity dated 06/04/2010
7. Purchase order for the wind power project between SIIL & Suzlon India Private Ltd dated 05/08/2010
8. Prior consideration –F-CDM-Form dated 23/06/2010
9. Prior consideration intimation to UNFCCC & NCDMA dated 01/07/2010
10. Stakeholders consultation process- 26/10/2010
11. Techno commercial evaluation of wind energy generation report by CECL dated 22/05/2010
12. Maharashtra Energy Development Authority infrastructure clearance dated 25/02/2011 for sites JAI-11, JAI-27, JAI-28,JAI-29
13. Maharashtra Energy Development Authority infrastructure clearance dated 11/03/2011 for sites JAI-02, JAI-03, JAI-19,JAI-22, JAI-23
14. Maharashtra Energy Development Authority infrastructure clearance dated 25/02/2011 for sites JAI-05, JAI-18,JAI-21
15. Maharashtra Energy Development Authority infrastructure clearance dated

05/03/2011 for sites JAI-07, JAI-08
16. Maharashtra Energy Development Authority infrastructure clearance dated 05/03/2011 for sites JAI-09
17. Maharashtra Energy Development Authority infrastructure clearance dated 22/07/2011 for sites JAI-04
18. Maharashtra Energy Development Authority commissioning certificate dated 02/04/2011 for JAI-02, JAI-03
19. Maharashtra Energy Development Authority commissioning certificate dated 02/04/2011 for JAI-19, JAI-22, JAI-23
20. Maharashtra Energy Development Authority commissioning certificate dated 07/09/2011 for JAI-04
21. Maharashtra Energy Development Authority commissioning certificate dated 18/03/2011 for JAI-05, JAI-07, JAI-08, 18/03/2011 for JAI-18, JAI-21, JAI-28, JAI-11, 18/03/2011 for JAI-27, JAI-29
22. Maharashtra Energy Development Authority commissioning certificate dated 02/04/2011 for JAI-09, JAI-11
23. Technical Specifications for the Suzlon WTG S-88 model
24. PP's declaration for no ODA/public funding dated 01/08/2011
25. Maharashtra Electricity Regulatory Commission order dated 24/11/2003
26. Maharashtra Electricity Regulatory Commission order dated 01/10/2006
27. Maharashtra Electricity Regulatory Commission order dated 17/08/2009
28. Maharashtra Electricity Regulatory Commission order dated 12/09/2010 http://www.mercindia.org.in/pdf/Order%2058%2042/Open_Access_Wheeling_Charges_2010_11.pdf
29. Screen shot of Yield to Maturity value from Reserve Bank of India dated 10/03/2010
30. Evidence to support the Stock prices
31. BSE 500 index low stock value on 31/03/2010 considered for market returns– Evidence
32. Credit notes for the month February 2012
33. Common practice analysis evidence pack
34. Benchmark calculation using BSE SENSEX index

35. Evidence beta consideration - Groenewold, N. and P. Fraser (2000), "Forecasting Beta: How Well Does the 'Five Year Rule of Thumb' Do?", Journal of Business Finance & Accounting, Vol. 27, No. 7-8, pp. 953-982(30).
36. Letter dated 18/10/2010 from Suzlon referring to the PO for 18nos.WTGs (2.1 MW each) to the PP (JAI-06 WTG location site constraint)
37. Letter dated 03/03/2011 from Suzlon referring to the PP about site constraints at JAI-01 & JAI-04 WTG locations.
38. Letter dated 09/07/2011 from Suzlon referring to the PP about the starting of development work at WTG location at JAI-04 and non settlement of land issues at WTG location JAI-01.
39. Credit notes dated 17/09/2012 for supply of electricity from project activity to the grid.
40. HT Electricity bill of PP's industrial facility located at Hadapsar, Pune for the month of September 2012

Category B documents (other documents referenced)

1. ACM 0002-"Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (Version 12.3.0)
2. "Tool to calculate the emission factor for an electricity system" Version 02.2.1
3. CO2 Baseline Database for the Indian Power Sector, User Guide Version 6.0
4. Tool for demonstration and assessment of additionality (Version 6)
5. User guide version 6.0 CO2 baseline database for Indian power sector. http://cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm
6. Clean Development Mechanism Project design document form (CDM- PDD)
7. Guidelines for completing the Project Design Document (CDM-PDD) and the Form for proposed new small scale methodologies (CDM-NM) Version 07
8. Guidelines on the Assessment of Investment Analysis version 05 (Annex 5 to the report of 62nd meeting of the CDM-EB)
9. Guidelines on the Demonstration and Assessment of prior consideration of the CDM (Version 04)
10. Guideline for the reporting and validation of plant load factors (Version 01)
11. Clean Development Mechanism Validation and Verification Manual Version 01.2 (Annex 01, EB 55)
12. Eligibility Criteria for Host Country Approval, National CDM Authority, Ministry of

Environment & Forests
13. Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006
14. Website referred for the SIIL details http://www.seruminstitute.com/content/faq_dtp.htm
15. Details for the WTG technology was referred at http://www.cwet.tn.nic.in/Docu/RLMM_List_01_2011.pdf
16. Prior consideration of the PP on the UNFCCC CDM website:http://cdm.unfccc.int/Projects/PriorCDM/notifications/index_html
17. The Maharashtra Electricity Regulatory Commission (MERC) Order dated 24/11/2003, clause no.2.2.2B http://www.infraline.com/power/setup/MAHOrders_files/WindEnergyOrder241103.pdf for CUF
18. Income Tax benefits details referred at http://law.incometaxindia.gov.in/DitTaxmann/IncomeTaxActs/2005ITAct/section80ia.htm
19. Euro exchange rate was referred at http://www.oanda.com/currency/historical-rates/
20. RBI risk free rate was referred at http://www.rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=11067
21. EIA notification S.O 3067 dated 01/12/2009 at http://moef.nic.in/downloads/rules-and-regulations/3067.pdf
22. EIA notification dated 14/09/2006 http://www.moef.nic.in/legis/eia/so1533.pdf
23. Reserve Bank of India results of quarterly survey of professional forecasters on major macroeconomic indicators for the year 2010-11(Quarter 2), page 5.

7.3 Appendix C: List of persons interviewed

Serum Institute of India Limited

Mr.D R Purohit	Addl. Director, Accounts & Audit, SIIL
Mr .Milind,	Engineer
Mr. Santosh Tupe,	Manager Projects
Mr. Vijay Bharate	Cost Accountant

Suzlon Energy Limited

Mr. Satish V.Vernekar	Area Service Manager, Customer Service
Mr. Mahesh Arali	Manager, Customer Service

MSEDCL

Mr. Sudhir Naik	Substation Engineer

Local Villagers

Mr. S.Murali	Security Guard
Mr. Srinivas	Farmer
Mr. Purvi	Farmer

7.4 Appendix D: How due account has been taken to the public input made to the validation requirements

The PDD was made publicly available in accordance with the requirements of the Procedures for processing and reporting on validation of a CDM project activity for the period of 04 May 11 - 02 Jun 11 as per

http://cdm.unfccc.int/Projects/Validation/DB/XXYJMA0QDZ2RRLBZIVGFF0ZFKQ3VPP/view.html

Three comments were received during the period and the comments were made publicly available.

Comments received have been taken into consideration as follows:

Comment no (1)	Response from PP	Evaluation of Response
The PP states that they have considered 80% accelerated depreciation. However the PDD is silent on the tax shielding as a result from accelerated depreciation. PPs cleverly do not consider the accounting tax offsetting in their companies while calculating the IRR. This is evident from the recently registered projects and those requesting registration. The DOE is therefore requested to critically analyze how the accelerated depreciation benefit has been taken into account and confirm the accounting of the cash inflows as a result of the negative tax liability in the initial years. DOE should not be misguided by the financial presented by the PP or consultant which are custom made for CDM purposes and not the actual financial	It may please be noted that the PP has considered tax shielding in the calculations and the spreadsheet for the same has been made available to the DOE. The project cash flows have been evaluated considering the tax offsetting.	PP has considered tax shielding and the calculations presented in the financial analysis spreadsheet are found to be correct. The cash flows presented in the financial analysis spreadsheet consider tax offsetting and are found to be correct.

considered at the investment decision. Note that considering cash inflows results in an increase in the IRR making wind projects a profitable venture.		
Please also check the offer from WTG supplier and Purchase Order while validating the PLF. It may be so that the third party report which is made after investment decision making - indicates a lower PLF. The PLF seems to be very low. Also check the tariff order.	The offer, purchase order and the third party wind assessment report have been submitted to the DOE.	PLF of the project activity is validated in accordance with "Guidelines for the reporting and validation of plant load factors" (Version 01) and is appropriate. Also refer closure of CL03.
<u>Benchmark:</u> No details are provided on the beta estimation. Is the beta levered or unlevered and what is the reason?? How is the beta appropriate for irr chosen? Benchmark: The benchmark is too high. Even after considering CDM benefits the IRR will not cross the benchmark. Then WHY did the PP go ahead with this non-profitable venture?? This clearly indicates the benchmark is made high just to prove additionality and is not the real benchmark expected by the PP. Why has the PP considered Reliance Infrastructure Ltd for beta determination when Reliance	The Beta calculation has been presented in the PDD and spreadsheet and is available to the DOE. The Beta value evaluated is the equity beta or levered beta for the power sector companies listed in the BSE-500. The equity IRR does not cross the benchmark even after considering the CDM revenues however the investment in the project has been undertaken based on the understanding of expected CER prices that would alleviate (minimize the gap between the expected returns and the project returns) and therefore went ahead with the investment. All the major power sector companies included in the BSE-500 have been considered. Reliance Infra is one of the major power companies and is thus considered for the calculation of beta. The average beta is considered for the benchmark calculations and is calculated for the 9 power sector companies that are listed in the BSE-500. For the estimation of the	Refer Closure of CAR04 and section 6 c of the protocol for detailed validation of the benchmark value.

Infrastructure Ltd. has many other businesses other than pure power generation? How come the risk profile of Reliance Infrastructure Ltd match with the project activity which involves wind electricity generation? What is the vintage considered for beta determination? Is considering only one year appropriate? Why tax computations for beta are only considered for one year?? What is the basis for considering a particular vintage for the market returns, beta estimation and risk free returns?	risk profile, data for at least 2-5 years needs to be used[5]. Thus, the PP has considered the analysis of beta for 3 years. Thus, the PP has calculated beta over a period of 3 years prior to the date of decision making. The calculation for the same is provided in the spreadsheet. All the major power sector companies listed in the BSE-500 have been considered. The BSE-500 Index is a Broad-Based Index constituting 500 companies across 20 sectors listed at the Exchange, representing approximately 93% of the total Market Capitalization. It is an index which covers all the major Power companies and is thus used for arriving at the Benchmark value. Further, the market return has been computed as the Compound Annual Growth Rate for the BSE-500 based on the data from February 1, 1999 (since introduction of the index) to the month for decision making. The risk free return rate is the Yield to Maturity Rate for Government Securities for a term of 20 years, as published in the Reserve Bank of India (RBI) Bulletin on the 12th October 2010	
Why the particular index is considered for calculating the market returns? DOE to evaluate whether the PP has made any other investments considering the same index. Only because a particular index results in a higher benchmark??	SIIL (the project participant) is a manufacturer of immune-biological, including vaccines in India and was incorporated n 1984. This is the first project activity being undertaken by SIIL with the motive of utilizing the wind power for captive purpose. At the time of investment decision, there was no precedence of an investment made by SIIL in renewable energy based power generation. Hence, a comprehensive investment analysis was sought for decision making where the project returns were compared to a benchmark	The validation team confirmed that the PP has used the same index for the investment analysis in another small scale wind power project through the link. https://cdm.unfccc.int/Projects/DB/LRQA%20Ltd1335362700.21/view

[5] Aswath Damodaran states, "Risk and return models are silent on how long a time period one needs to use to estimate betas. Services use periods ranging from two years to five years for beta estimates, with varying results", Aswath Damodaran, Estimating risk parameters (p.9). The article can be accessed at http://pages.stern.nyu.edu/~adamodar/pdfiles/papers/beta.pdf

	which is standard in the market. Subsequently the project participant has also invested in another renewable energy power generation project and has used the same index for the investment analysis.	
Project cost seems to be very high. Are the quotations real or fabricated?	The project costs are based on the Quotations provided by the technology supplier. The same have been made available to the DOE.	Refer section 6 c of the protocol for detailed validation of the project cost. The project cost used in the investment analysis has been sourced from the supplier quotation dated 12/03/2010. The supplier quotation was reviewed in original during the site visit by the validation team. The total cost of the project is INR 2160 million. Further the validation team has cross checked the total project cost considered by the PP at the time of decision making with actual cost of the project as mentioned below. As confirmed from review of the Purchase order for supply of WTGs for wind power project on Suzlon Energy Ltd. dated 05/08/2010
Are REC benefits being claimed? How will the DOE ensure that the PP does not claim REC benefits during project operation?	Due to the current declining trend in the REC market, the PP has not availed REC benefits.	Validation team confirms that PP is not availing REC benefits.
DOE to submit a negative opinion in case the IRR does not cross the benchmark even after considering CDM benefits as it clearly indicates the projects unviability in any case. Why would any one invest in a loss making venture? And if the PP can still go ahead with the project - it indicates that the benchmark is fabricated and is not considered by the PP while making the investment decision!! DOE to validate this critically!! How are the	The comment is addressed to the DOE. All evidence to support the investment analysis has been presented to the DOE.	Refer Closure of CAR04 & CL03 and section 6c of the protocol for detailed validation of the benchmark value. The cash flows presented in the financial analysis spreadsheet consider tax offsetting and are found to be correct. The validation team confirms that the tax calculation considers benefit under section 80 IA of the Income Tax Act under which projects are entitled to a tax holiday for 10 consecutive years out of the first 15 years

investment decisions really made??? DOE to check if the financials correctly apply the 10 year tax holiday - i.e. not liable for taxes for 10 years from the initial 15 years.		
Stakeholder consultation: No details provided on which all stakeholders attended the meeting.	The stakeholders present for the meeting included SIIL employees, technology & O&M service providers, local population, etc. The attendance sheet of all the stakeholders who attended the meeting is provided to the DOE.	The local stakeholders were interviewed during the site visit and it was noted that no adverse comments on project were given by them. The minutes of meeting for the local stakeholder consultation process, attendance sheet, photographs taken during the meeting etc have been reviewed by the validation team and found to be appropriate. Refer section 8 of the protocol below for validation opinion on the local stakeholder consultation process
Submitted by: Babloo		
Comment no (2)	Response from PP	Evaluation of Response
It is evident from the PDD that the values are consistent and it is definitely forged and cooked up values to show a non CDM project as a CDM project. What is this? DoE to check the Detailed Project Report and Feasibility Report which is submitted to the other agencies and Banks by Project owner and ensure that the values match with the DPR/FR submitted to DoE also. After careful study of PDD it is found that DPR/FR is in different versions made and submitted with different purposes to different agencies which is totally unacceptable, illegal and unethical. PP/Consultant may show some undertaking	Comments not considered being relevant to the project.	Refer Closure of CAR03, CAR04, CL03 and section 6 c of the protocol for detailed validation of the project additionality.

letter from bank manager to DoE stating that both DPR's are same. These kinds of letters should not be accepted and entertained by DoE. While collecting the DPR/FR from banks and other agencies, all DPR/FR pages should be counter signed by Banks and other agencies so that the real DPR/FR given to other parties by the PP/Consultant is same as the one submitted to DOE. In this particular project there is clear cut evidence that DPR/FR values are changed/ fabricated mischievously and intentionally. This must be probed fully. DOE must take a written undertaking from the PP/Consultant about the list of parties to whom this DPR/FR is submitted and for what purposes. Then DOE should cross check with all the parties and confirm that the same DPR/FR is submitted to all the parties correctly without any changes. DOE must not accept any reports and undertakings from PP/Consultant. DOE must make independent evaluation and use totally different parties without informing the PP or Consultant to cross check the facts. DOE to write to the party who prepared the DPR/FR which is submitted to the banks and other agencies and the same is verified against the one submitted to the DOE by PP/Consultant. This project is a fabricated		

and fake CDM project and must be rejected by the DOE right away. DOE should not support this kind of projects otherwise CDM EB should suspend this DOE for at least one year.		
Submitted by: zhong zhou li		
Comment no (3)	**Response from PP**	**Evaluation of Response**
1. Purpose of the project and how the proposed project activity reduces greenhouse gas emissions are not briefed in the PDD. Refer section A.2.	1. The project will be utilizing wind energy for generating clean electricity for captive use which would have otherwise been generated through fossil fuel dominated power plants, contributing to reduction in specific emissions (emissions of pollutant) including GHG emissions and also reducing its dependence on fossil fuels for energy requirements.	1. The purpose of the project is defined in the PDD. Also refer section 3 of the protocol for detailed validation of project description
2. How environmentally safe and sound technology is used for the project and details of technology transfer is not demonstrated adequately. Refer A.4.2	2. Section A.4.2 describes the technology used and the make for the same. The project activity involves the installation of state-of–art technology. The wind turbine generators used for the project activity are of the latest technology and are safe and sound as per all the standards and norms.	2. Justification by PP on the technology used by the project activity is accepted and appropriate. Also refer section 3 of the protocol for detailed validation of project description
3. Non-debundling nature of the project activity is not adequately justified as per EB54 Annex 13 (Debundling tool). Refer A.4.5.	3. The project promoter has confirmed that there is no registered small scale project activity registered within the previous two years with them in the same project category and technology whose project boundary is within 1km of the project boundary of the proposed small scale activity. Thus the project is not a debundled component of any other large-scale project activity.	3. Not appropriate to the normal scale project.
4. Please check the project	4. As per the guidelines mentioned SSC methodology	4. Project boundary is in line with the methodology. Also refer

boundary of the project activity is not based on the guidance of the applicable project category.	AMS I.D. (Version 17) of Annex B of the simplified modalities and procedures for small-scale CDM project activities, the project boundary is defined as he "physical, geographical site of the renewable generation source delineates the project boundary." The project boundary includes the electricity generation equipment at the site and the transport through the grid to the captive consumption site. Hence, project boundary is considered within these terminal points.	section 5a of the protocol for detailed validation of project boundary
5. Why has option A (Combined margin) been chosen for calculating emission factor is not justified. Refer B.6	5. The combined margin calculations are in accordance to the latest version of "Tool to calculate the emission factor for an electricity system".	5. Computation of emission factor is in line with the methodology. For response to comments no 33 to 43, refer section 5c of the protocol
6. 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.	6. An investment analysis of the project activity was conducted with equity Internal Rate of Return (IRR) as the financial indicator. IRR is one of the known financial indicators used by banks, lending institutions and project developers for decision making	6. The financial indicator is now justified in the PDD. Refer section 6c of the protocol
7. 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.	7. The project participant has included only grid power plants in the calculation.	7. Computation of emission factor is in line with the methodology. For response to comments no 33 to 43, refer section 5c of the protocol
8. Basis of choosing PLR as benchmark is not adequately demonstrated in the PDD	8. PLR is not the benchmark for the project activity.	8. PLR is not the benchmark for the project activity
9. All the issues of investment analysis guidelines are not discussed	9. Section B.5 has been drafted as per the CDM-PDD guidelines, the PDD is submitted to the DOE 10. All the integral assumptions have been included in the PDD. The PDD has been submitted to the DOE 11. There is no debt involved in this project activity. 12. The source for PLF is	9. For response to point no 9-18,20,24-30 Refer section 6 c of the protocol for detailed validation of investment analysis 10. For response to point no 19,21,22,23 Refer section 5 b and 5c of the protocol 11. For response to point no 31,32 Refer section 6a of the protocol 12. For response to point no 44-53- Refer section 7 of the protocol

in the PDD. Refer B.5. 10. Justification of parameters including O&M, insurance, loan, derating, escalation, and tariff are not demonstrated with justification. Refer B.5. 11. Please provide a proof for proposed debt to equity taken at the investment decision. Refer B.5 12. Proof for PLF is not justified. 13. Date of offer is not provided 14. Project cost is not as per state norms. Refer B.5. 15. O&M charges and its escalation is not as per norms 16. IT rate assumed is not as per standard practice. 17. The application of MAT which is based on tax holiday while calculating WACC is not appropriate. 18. The PP has not explained and justified the key assumptions and rationale. 19. The PP and consultant has not Illustrate in a transparent manner all data used to determine the baseline emissions. 20. Not demonstrated that the proposed	submitted to the DOE. 13. The offers (i.e. quotations dated 12/03/2010 and 15/03/2010 for Jaibhima & Kenersys respectively) have submitted to the DOE 14. Project cost considered is as per the initial quotations in order to estimate the returns from the project activity at the time of investment decision. 15. O&M charges & its escalation is as per the quotation from the O&M service provider 16. It rate is as per the Income Tax Act for the FY 2010-11 17. PP has considered tax shielding and however, MAT is not considered. 18. All the Key assumptions and the sources have been documented in the PDD and the financial spreadsheet and have been provided to the DOE. 19. The baseline emissions have been explained in section B.6 of the PDD and the same is submitted to the DOE. 20. The additionally is demonstrated in Section B.5 of the PDD as per the CDM-PDD guidelines. The PDD is submitted to the DOE. 21. The project activity conforms to all the applicable laws and regulations in India for Power generation using wind energy. The Indian Electricity Act, 2003 (May 2007 Amendment) which is relevant to the project activity does not influence the choice of fuel used for power generation. There is no legal requirement on the choice of a particular technology for power generation as per this Act. 22. The methodology followed will be “AMS I.D Version 17 - Approved methodology for Small Scale Projects” under the sectoral scope “Grid connected renewable electricity generation” which is most appropriate for this Project and is listed as per the UNFCCC norms. 23. Data that is calculated with equations provided in the approved category or default	13. For response to point no 54 Refer section 8 of the protocol

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. 21. National policies and circumstances relevant to the baseline of the proposed project activity are not being summarized clarify. 22. Explain and justify all relevant methodological choices for the proposed project activity 23. 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. 24. CER revenue assumed is not consistently applied 25. Project cost is not as per norms, DOE has to check and clarify. 26. The project cost of the project should be based on offer and not on purchase order or tariff order. 27. O&M charges considered are on higher side. Pls.	values specified in the category have been included wherever necessary as per the methodology used. 24. The CDM revenues have been considered in the financial analysis and the same has been provided to DoE. 25. Project cost is based on the quotations provided by the technology provider. The same is made available to the DOE 26. The project cost of the project is based on offer (Quotations) from the technology supplier and not on purchase order or tariff order. 27. O&M cost used is as per the offer from the O&M. The same is submitted to the DOE. 28. The Benchmark calculation is as per the latest version of the Additionally tool and the Guidelines to investment analysis which is relevant to the project activity. 29. The post-tax IRR is considered for the project activity 30. All the assumptions and data used for the calculation of the benchmark are demonstrated in the PDD and in the spreadsheet. These are made available to the DOE. PLR is not the benchmark for this project activity 31. The chronology of the project activity includes the date of the prior consideration of the project activity as “UNFCCC intimation (date:01/07/2010)” 32. The prior consideration form has been duly filled and submitted for the project activity. 33. The selection of simple OM based on low cost/must run resources is as per the CEA database Version 6. The calculation for the same is made available to the DOE 34. PP has provided for each parameter, chosen value or, where relevant, the qualitative information in the PDD & the spreadsheet. These are made available to the DOE 35. The PP has provided the all the data and information used	

clarify. 28. Benchmark calculation is not as per WACC tool (EB53 Annex 8) 29. Whether pre-tax or post tax IRR is selected is not demonstrated in the PDD. 30. 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. 31. Prior consideration of CDM which is important for the determination of additionality is not documented in the section B.5 of the PDD. 32. Date of PPA is not mentioned in the prior consideration of CDM 33. The selection of simple OM based on low cost/must run resources is not adequately justified. Refer B.6.1 34. PP has not provided for each parameter the chosen value or, where relevant, the qualitative information. 35. Please Provide the actual value applied. Where time series of data is used,	in the PDD as per the CDM PDD guidelines and the PDD is submitted to the DOE. 36. Data chosen has been justified wherever used, the source of the same has been provided in the PDD. 37. The OM calculation is as per latest Tool to calculate the emission factor for an electricity system (Version 02.2.1, EB 63). 38. Operating Margin calculation in Section B.6.1 is as per the Latest Version of the tool to calculate emission factor for an electricity system (Version 02.2.1, EB 63). 39. Operating Margin calculation in Section B.6.1 is as per the Latest Version of the tool to calculate emission factor for an electricity system (Version 02.2.1, EB 63). 40. The CEA data for build margin is calculated as per Emission factor tool. 41. The spreadsheet has been made available to the DOE. The calculation for the emission factor has been provided in the same. 42. There is no consumption of electricity, hence the project Emissions for ex ante calculations have been assumed as zero. 43. Section B.6.3 is corrected in the revised PDD and the same is submitted to the DOE. 44. Recording Frequency mentioned in the section B.7.1 is continuous monitoring, hourly measurement and at least monthly recording 45. At the MSEDCL sub-station, the total export & import to this feeder is monitored using the main meter & the check meter, which are electronic tri-vector meters. The total export at this meter is arrived at by multiplying the monthly meter reading to the multiplying factor of the meter concerned. The monthly meter reading is arrived at as the difference between the current meter reading and the previous meter reading	

where several measurements are undertaken or where surveys have been conducted, provide detailed information. 36. Explain and justify the choice for the source of data. 37. Ex-ante option of calculating OM is not adequately demonstrated. Step 3 of Refer B.6.1 38. 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 39. 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 40. The argument that CEA data for build margin is calculated as per Emission factor tool is not documented.	46. Description of the measurement methods and procedures is provided in the PDD and the same is made available to the DOE. 47. Detailed description of the monitoring plan, including an identification of the data to be monitored and the procedures that will be applied during monitoring is provided in section B.7 of the PDD. 48. The PP has included the sources of data that will be actually used for the proposed project activity in the PDD wherever relevant. 49. The PP has specified: i)the measurement methods and procedures including accepted industry standards or national or international standards which will be applied, ii) the measurement equipment used and iii) how the measurement is undertaken, in section B.7 of the PDD. 50. The sections B.7.1 and B.7,2 of the PDD specifies the calibration procedures that are applied, the measurement method, who is the responsible person / entity that should undertake the measurements and which is the measurement interval. 51. Detailed description of the monitoring plan is provided in the section B.7 of the PDD. Detailed O&M structure implemented by the project operator will in order to monitor emission reductions is now included in the revised PDD. 52. Section B.7.2 of the PDD describes the monitoring procedure, the QAQC procedure and the emergency preparedness for the project activity which demonstrate good monitoring practice of project activity. 53. Detailed data collection and archiving will be implemented by the project operator in order to monitor emission reductions. This is included in the revised PDD	

B.6.1 41. Spread sheet is not provided. The data should be presented in a manner that enables reproducing of the calculation of OM, BM, and CM. 42. The justification of negligible project emissions for wind project is not as per AMS. I. D ver 16.0 EB 54). 43. The emission factor value (Southern grid) for calculating baseline emission is wrong. Refer B.6.3 44. Net electricity should be continuously monitored, hourly measured and at least monthly recorded. Refer B.7.1 45. Metering regulations as per CEA norms is not adequately followed in monitoring plan. Refer B.7.2. 46. Where the values have been measured, include a description of the measurement methods and procedures that comply with the guidance provided under general guidance. 47. Provide a detailed description of the monitoring plan, including an identification of the data to be monitored and the procedures that	54. In order to address and incorporate the concerns of the local stake-holders, SIIL sent out invitation letters to all the stake-holders near the project location well in advance. The letter contained information of the date & site of the meeting along with a clear picture of the agenda of the meeting along with a broad description of the project activity.	

will be applied during monitoring. 48. 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.). 49. 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. 50. 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? 51. 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. 52. Clearly indicate the responsibilities for and institutional arrangements for data collection and archiving. 53. The monitoring plan should reflect good monitoring practice appropriate to the type of project activity. Provide any relevant further background information. 54. 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. Submitted by: Lawrance		

Appendix E: Certificate of Appointment

Validation of "Wind power project at Jaibhim by SIIL"

We hereby certify that the following personnel have engaged in the validation process that has fully satisfied the competence requirements of the validation of the CDM project activity.

Name of Person	Assigned Roles
Shubha Shanbhag	Team Leader & Sector Expert
Ponnada Rama N Rao	Team Member &Team Leader[6]
B Rampradap	Sector Expert to the validation team
Imran Ustad	Technical Reviewer & Sector Expert
Michiaki Chiba	Decision Maker for initial submission to UNFCCC
Ketan Deshmukh	Decision Maker for incompleteness check submission to UNFCCC

Signed by
Decision Maker

Ketan Deshmukh
Date: 27 November 2012

[6] Shubha Shanbhag participated in the validation team as team leader till 29/03/2012. Ponnada Rama N Rao who earlier participated in team member capacity led the team from 29/03/2012 onwards in absence of Shubha Shanbhag.

7.6 Appendix F: Validation Protocol and findings log

	Validated situation	Conclusion
SECTION 1. Approval		
Host Country Approval		
1. Has the Host country DNA provided a written approval?	Yes ☒ No ☐ NA☐ [7] CAR01 was raised to confirm the availability of LoA. PP has submitted the LoA no.4/22/2011-CCC dated 10/04/2012.	OK ~~CAR 01 was closed.~~
2. Confirm that the letter has been issued by the Party's DNA and is valid for the proposed CDM project activity under validation	Yes ☒ No ☐ NA☐ The LoA dated 10/04/2012 with reference 4/22/2011-CCC is issued by the Ministry of Environment & Forests, Government of India, which is the designated national authority (DNA) of the host country as per http://cdm.unfccc.int/DNA/index.html?click=dna_forum. The LoA is issued and valid for the proposed project activity	OK
3. Mention the means of validation employed to assess the authenticity of the Letter of Approval. Indicate the source of the LoA (for example, PP or directly from the DNA)	The LoA was made available by the PP. The LoA was also compared with those of other approval cases of registered projects of 3977, 4576, 4985, and 5161 issued by the DNA. The team confirmed the authenticity of the letter issued.	OK

[7] For each section and question where a YES / NO / NA answer is required, explain your choice.

	Validated situation	Conclusion
4. Does the written Letter of Approval confirm the following: (a) The Party is a Party to the Kyoto Protocol (including ratification)? (b) Participation is voluntary? (c) The proposed CDM project activity contributes to the sustainable development of the country? (d) It refers to the precise proposed CDM project activity title in the PDD being submitted for registration?	Yes ☒ No ☐ NA☐ The LoA confirms: (a) The Host Country Party has ratified the Kyoto Protocol in August 2002. (b) The participation is voluntary. (c) The project contributes to sustainable development in the Host Country. The LoA indicates the precise title of the proposed project activity as indicated in the PDD.	OK
5. Is the letter of approval unconditional with respect of (a) to (d) above?	Yes ☒ No ☐ NA☐	OK
6. Does the LoA from the host party acknowledge the bundle activity (if applicable)?	Yes ☐ No ☐ NA☒	NA
Annex I Party Approval		
7. Has the Annex I country DNA provided a written approval?	Yes ☐ No ☐ NA☒	NA
8. Confirm that the letter has been issued by the Party's DNA and is valid for the proposed CDM project activity under validation.	Yes ☐ No ☐ NA☒	NA
9. Mention the means of validation employed to assess the authenticity of the Letter of Approval. Indicate the source of the LoA (for example, PP or directly from the DNA).	Not Applicable	NA

	Validated situation	Conclusion
10. Does the written Letter of Approval confirm the following: (a) The Party is a Party to the Kyoto Protocol (including ratification)? (b) Participation is voluntary? (c) It refers to the precise proposed CDM project activity title in the PDD being submitted for registration?	Yes ☐ No ☐ NA☒	NA
11. Is the letter of approval unconditional with respect of (a) to (c) above?	Yes ☐ No ☐ NA☒	NA
Host Country and Annex I Party Approval		
12. Do any of the Letters of Approval contain additional specification of the project activity? Like: - PDD Version number? - Validation report version number? Make sure that the request for registration is made on the basis of the documents specified in any of the letters.	The LoA does not refer to any specific version number of the PDD or validation report.	OK

		Validated situation		Conclusion
SECTION 2. Participation				
1	Confirm that the PPs are listed in a tabular form in section A.3 of PDD and that this information is consistent with the contact details provided in Annex 1 of the PDD and with the contact details in the MoC.	Host Party PP name in PDD/ A.3	Serum Institute of India Limited	OK
		Host Party PP name in PDD/ Annex 1	Serum Institute of India Limited	
		Host Party PP name in MoC	Serum Institute of India Limited	
		Annex 1 Party PP name in PDD/ A.3	NA	
		Annex 1 Party PP name in PDD/ Annex 1	NA	
		Annex 1 Party PP name in MoC	NA	
2	Confirm that each of the PPs has been approved by at least one Party involved.	Yes ☒ No ☐ NA☐		OK
3	Confirm that no entities other than those approved as PPs are included in section A.3 of PDD.	Yes ☒ No ☐ NA☐		OK
4	Ensure that the approval of participation has been issued from the relevant DNA. If in doubt verify this with the corresponding DNA.	The Letter of Approval (LoA) dated 10/04/2012 has been issued by the host country DNA. The Designated National Authority (DNA) is the National Clean Development Mechanism Authority (NCDMA) established in the Ministry of Environment and Forests (MoEF), Government of India.		OK

	Validated situation	Conclusion
5 Has the MoC been completed as per the latest "Procedures for MoC between the project participants and the Executive Board"? - No modifications to the template / form should be made and each document should be clearly dated - Title of the project and names of project participants and focal points should be fully consistent with those indicated in all other project documentation - Focal point scopes should be clearly and correctly indicated - Contact details and specimen signatures of focal point entities including those of project participants in Annex 1 should be correctly entered. Only one telephone, fax, email contact should be entered per authorized signatory. In cases where additional contact details are included, only the first indicated information will be taken into account and only the official business address of the proposed entity should be provided on the F-CDM-MOC form. - The Statement of Agreement in Section 3 should be signed by one authorized signatory for each project participant; signatures made available in Section 3 should correspond to those indicated in the related Annex 1 document; focal point entities who are not designated as project participants should not sign Section 3.	Yes ☒ No ☐ NA☐ MoC dated 11/04/2012 was submitted by the PP • Satish Deshpande is the sole focal point and the information is filled in accordance with the MoC form F-CDM-MOC and the requirements of the procedures. • No modifications were made to the template and date is clearly specified • Title of project and names of project participant and focal point is consistent with other project documents shared/submitted by PP • The information is filled in accordance with the MoC form F-CDM-MOC and the requirements of the procedures	OK

	Validated Situation	Conclusion
SECTION 3. Project design document		
1. Is the project activity Small Scale or Normal Scale?	Normal Scale ☒ Small Scale ☐ Bundled Small Scale ☐ (cross as appropriate)	OK
2. Has the PDD used the latest template and guidance from the CDM Executive Board available on the UNFCCC CDM Website? Check outputs from the completeness check.	Yes ☒ No ☐ Guideline for completing the simplified project design document (CDM-PDD) Version 7, EB41, Annex 12 and PDD Format Version 03, EB25, Annex 15 which are the current versions available in UNFCCC CDM website. Guidelines for completing the project design document form for CDM project activities (Ver01.0, EB66 Annex08) is also currently available under VVS track. The last date for the RfR of projects using VVM track is 30/09/2012.	OK

	Validated situation	Conclusion
SECTION 4. Project description		
1. Describe the process undertaken to validate that 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.	Serum Institute of India Limited (SIIL) is engaged in manufacturing of immuno-biologicals, including vaccines in India. SIIL was founded in 1984 as per the certificate of incorporation included in the Appendix B. SIIL has established itself as the world's largest producer of Measles and DTP group of vaccines. (Refer http://www.seruminstitute.com/content/faq_dtp.htm). The proposed project activity is installation of a 33.6MW capacity (16nos.X 2.1MW each) wind power project, located in Jaibhim village, Dhule district, Maharashtra, India. The project activity employs WTGs from Suzlon of S88 with specifications as follows: **Parameter** / **Specification** Rated Power: 2,100 kW Rotor diameter: 88 m Swept area: 6,082 m^2 No. of blades: 3 Lifetime: 20 years Cut in wind speed (Start): 4 m/s Cut out wind Speed (Stop): 25 m/s Rotor Speed: 15-17.6 rpm Hub Height: 80 m Generator Type: Asynchronous Insulation: Class H The purpose of the project activity is to generate electricity from wind energy which is a renewable source and to be wheeled to substation through a 33kV overhead high tension line (North East West North-East (NEWNE) Grid) for captive use (self use) at PP's industrial facility located in Hadapsar, Pune. The net electricity supplied by the project activity to the grid (at the substation point) shall be adjusted from the PP's electricity consumption at the consumption end at the industrial facility of the PP located at Pune. The validation team has cross	OK ~~CL01,CL02, CL03 were closed~~

	Validated situation	Conclusion
	checked the buyer number on the credit notes generated for the WTG(s) is the same consumer number mentioned on the MSEDCL bill for the captive consumption unit of SIIL at Pune, thereby confirming the quantum of electricity generated is wheeled for the captive consumption. LRQA confirmed that the PP is wheeling the generated electricity for captive consumption (self use) through sample credit notes and electricity bills of the industrial facility. The validation team has confirmed the mechanism of the transferring the electricity units generated to the PP's captive consumption unit, in case of any units generated in particular month are not adjusted in the same month, as MSEDCL does a zone wise adjustment and also safeguards its revenue target every month. Thus, if excess units generated, other than adjusted are banked, which will be adjusted in subsequent months and are valid upto the expiry of open access permission (one year) of the PP. During the process of validation, LRQA confirmed the capacity, unique identification of the project activity, estimated power generation, arrangement for evacuation of electricity generated, technical specifications, date of commissioning and necessary clearances for setting the project activity. The list of documents reviewed during the course of the validation is presented under Appendix B. The PP had initially conceptualised for implementing 18 WTGs of 2.1 MW each, but implemented a total capacity of 33.6 MW with 16 WTGs of 2.1 MW each, due to the constraints faced by the PP in procurement of land for the installation and commissioning of two WTGs (JAI-01, JAI-06), PP has withdrawn the 2WTGs. The validation team reviewed the following evidence: • Letter from the WTG supplier Suzlon dated 18/10/2010 indicating that the 13WTGs out of 18 WTGs are clear and 5WTGs (JAI-06, JAI-25 & JAI-26, JAI-10 & JAI-20)facing the site constraints with regard to the land acquisition for installation and commissioning. The PP has withdrawn the WTG at the location JAI-06, and opted for alternatives of JAI-04, JAI-11,JAI-21,JAI-22 as suggested by the WTG supplier. • Letter from the WTG supplier Suzlon dated 03/03/2011 with regard to the status of 17WTGs selected by the PP; 7WTGs are cleared from MEDA infrastructural clearance, the MEDA infrastructure clearance is expected for 8 WTGs and 2WTGs are delayed at JAI-01 & JAI-04 due to	

	Validated situation	Conclusion

the unforeseen right of way (land acquisition) problem.

- Letter from WTG supplier Suzlon dated 09/07/2011 indicating that the project development work started at JAI-04 location, but the right of way (land) issue is pending and not settled. Hence the PP has withdrawn the location JAI-01. The PP has withdrawn WTGs at Locations JAI-06, JAI-01 due to the site constraints (Right of Way land issues), and a total of 16nos. WTGs were installed and commissioned as against the envisaged 18Nos. of WTGs (as per the purchase order). The validation team confirmed the installation and commissioning through the MEDA Clearance, commissioning certificates and site visit.

The validation team confirmed the location of WTGs, unique identification numbers and the commissioning status from the commissioning certificates as given below:

Location No.	Village	Commissioning Certificate dated	Commissi-oned on	Gut no.
JAI-02	Runmali	02/04/2011	19/03/2011	95/1
JAI-03	Runmali	02/04/2011	19/03/2011	79/3
JAI-04	Vaskhedi	07/09/2011	06/09/2011	87
JAI-05	Jaitane	18/03/2011	15/03/2011	129/2
JAI-07	Runmali	18/03/2011	15/03/2011	46
JAI-08	Vajdare	18/03/2011	15/03/2011	109
JAI-09	Akhade	02/04/2011	31/03/2011	122
JAI-11	Jaitane	02/04/2011	31/03/2011	582/3 & 582/4
JAI-18	Shivajinagar	18/03/2011	11/03/2011	124/1
JAI-19	Shivajinagar	02/04/2011	19/03/2011	116
JAI-21	Shivajinagar	18/03/2011	11/03/2011	124/3
JAI-22	Shivajinagar	02/04/2011	19/03/2011	386/3 & 386/4
JAI-23	Bhamer	02/04/2011	19/03/2011	391/1
JAI-27	Bhamer	18/03/2011	12/03/2011	370
JAI-28	Bhamer	18/03/2011	11/03/2011	113 & 313/1
JAI-29	Bhamer	18/03/2011	12/03/2011	315/2

	Validated situation	Conclusion
	The technical details with respect of the WTG provided in the PDD were confirmed with technical brochures from Suzlon. In confirming the details, the parameters with respect of the rotor diameter, rotor speed, nominal power, hub height and the expected annual generation were given special emphasis. The model S-88 of Suzlon has been listed by 'Centre for Wind Energy Technology', Govt. of India confirming availability of type certificate. The team has cross checked the techno commercial evaluation PLF study by a third party Consolidated Energy Consultants Limited (CECL) report dated 22/05/2010. The report specifies a net generation of 3,485 MWh/WTG with a CUF of 18.94%. (Refer to section 9 of page 14 and table 3 of page 23). The expected net PLF from the project activity is 18.94% as per study conducted by third party for determining PLF in accordance with the Para 3 (b), Annex 11 of the report of 48th meeting of the CDM EB "Guidelines for the reporting and validation of plant load factors" (Version 01). PLF considered by the PP in investment analysis based on the supplier quotation is higher than PLF estimated by the third party (specific to the site) however this value is considered to be conservative for the financial analysis and hence accepted. The description of the project activity was validated based on review of the PDD and supporting documents, physical site visit and field interviews that included the overall design document, technical specification from supplier offer and purchase order. CL01 was raised as the PDD did not mention the WTG details. PP has revised the PDD including the WTG model details. CL01 was closed. PDD Version 01.1 did not specify the correct grid details, hence CL02 was raised. PP has now revised the PDD with correct grid of NEWNE, CL02 was closed. PDD Version 01.1 and IRR sheet did not specify the source of the PLF considered, hence CL03 was raised. PP has now revised the PDD and IRR sheet, CL03 was closed. Please refer Findings log at the end of the validation report for details on the	

<table>
<tr><th></th><th>Validated situation</th><th>Conclusion</th></tr>
<tr><td></td><td>findings raised and closure.</td><td></td></tr>
<tr><td>2. Confirm that the exact project location is provided in the PDD with Geographical coordinates, check the accuracy of them and the format of the notation (Grades, minutes, seconds or decimal indicating latitude N or S and Longitude E or W)
Please include here the Geographical coordinates:</td><td>The project activity involves installation of 33.6MW (16nos.WTGs with each 2.1MW capacity)..The PP has initially conceptualised for 18nos.of 2.1MW each, but implemented the project with a capacity of 33.6MW with 16nos. of 2.1MW each due to the availability of financial resources. The WTGs are of Suzlon make. The project activity is located in Dhule district of state of Maharashtra, India. The geographical location (including village names) and co-ordinates of the project activity WTGs are as below:

<table>
<tr><th>Location No.</th><th>Village</th><th>District</th><th>Latitude</th><th>Longitude</th><th>Gut no.</th></tr>
<tr><td>JAI-02</td><td>Runmali</td><td>Dhule</td><td>21^0 7' 48"</td><td>74^0 16' 3"</td><td>95/1</td></tr>
<tr><td>JAI-03</td><td>Runmali</td><td>Dhule</td><td>21^0 7' 36"</td><td>74^0 16' 4"</td><td>79/3</td></tr>
<tr><td>JAI-04</td><td>Vaskhedi</td><td>Dhule</td><td>21^0 7' 20"</td><td>74^0 15' 58"</td><td>87</td></tr>
<tr><td>JAI-05</td><td>Jaitane</td><td>Dhule</td><td>21^0 7' 41"</td><td>74^0 18' 15"</td><td>129/2</td></tr>
<tr><td>JAI-07</td><td>Runmali</td><td>Dhule</td><td>21^0 8' 16"</td><td>74^0 18' 24"</td><td>46</td></tr>
<tr><td>JAI-08</td><td>Vajdare</td><td>Dhule</td><td>21^0 8' 43"</td><td>74^0 18' 31"</td><td>109</td></tr>
<tr><td>JAI-09</td><td>Akhade</td><td>Dhule</td><td>21^0 7' 54"</td><td>74^0 20' 54"</td><td>122</td></tr>
<tr><td>JAI-11</td><td>Jaitane</td><td>Dhule</td><td>21^0 7' 24"</td><td>74^0 20' 49"</td><td>582/3 & 582/4</td></tr>
<tr><td>JAI-18</td><td>Shivajinagar</td><td>Dhule</td><td>21^0 5' 42"</td><td>74^0 20' 15"</td><td>124/1</td></tr>
<tr><td>JAI-19</td><td>Shivajinagar</td><td>Dhule</td><td>21^0 5' 26"</td><td>74^0 20' 11"</td><td>116</td></tr>
<tr><td>JAI-21</td><td>Shivajinagar</td><td>Dhule</td><td>21^0 5' 20"</td><td>74^0 19' 39"</td><td>124/3</td></tr>
<tr><td>JAI-22</td><td>Shivajinagar</td><td>Dhule</td><td>21^0 5' 29"</td><td>74^0 18' 59"</td><td>386/3 & 386/4</td></tr>
<tr><td>JAI-23</td><td>Bhamer</td><td>Dhule</td><td>21^0 5' 41"</td><td>74^0 19' 11"</td><td>391/1</td></tr>
<tr><td>JAI-27</td><td>Bhamer</td><td>Dhule</td><td>21^0 5' 10"</td><td>74^0 18' 30"</td><td>370</td></tr>
<tr><td>JAI-28</td><td>Bhamer</td><td>Dhule</td><td>21^0 5' 0"</td><td>74^0 17' 45"</td><td>113 & 313/1</td></tr>
<tr><td>JAI-29</td><td>Bhamer</td><td>Dhule</td><td>21^0 5' 17"</td><td>74^0 17' 39"</td><td>315/2</td></tr>
</table>
(Gut numbers are the land survey numbers used for identification of the land in the host country)</td><td>OK</td></tr>
</table>

	Validated situation		Conclusion
	The validation team conducted site visit and confirmed consistency of the described project activity in the PDD and the actual implementation. It could be confirmed that the project activity was commissioned and under operation during the time of the site visit. The site locations have been confirmed through commissioning certificates and through site visit interaction. The validation team confirmed the appropriateness of the project description in the PDD by reviewing project documentation and conducting the site assessment.		
3. Confirm that the physical site inspection reflects the description in the PDD of the proposed CDM project activity.	The validation team confirmed the appropriateness of the project description in the PDD by reviewing project documentation and conducting the site assessment.		OK
4. If the team did not undertake a physical site inspection, describe the justification as approved by the CDM Quality Manager. (VVM 01.2: 60-61) Describe briefly the physical site inspection: Travel details and installations, facilities and buildings visited.	Not Applicable		-
5. If the proposed CDM project activity involves the alteration of an existing installation or process, ensure that the project description clearly states the differences resulting from the project activity compared to the pre-project situation.	Pre-project	Project activity	-
	NA The project activity is a Greenfield project	NA	
6. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance (ODA).	The details of project funding were also discussed during the site visit and it was confirmed through the interviews conducted with the senior management that the project was funded through debt and equity and did not involve any diversion of ODA. CAR02 was raised, as the PP did not provide any details on the funding and ODA. The project participant has provided a declaration dated 01/08/2011 stating that it has not availed any ODA/public funding for the project.		OK ~~CAR02 was closed~~

	Validated situation	Conclusion
7. If the project activity is a small scale one, confirm that it is not a debundled component of a large scale project, in line with appendix C of the simplified M&P for SSC CDM project activities and the Guidelines for assessment of de-bundling for SSC project activities.	Not applicable	-

	Validated situation	Conclusion
SECTION 5. Baseline and monitoring methodology		
1. Have the baseline and monitoring methodologies selected by the project participants been previously approved by the CDM Executive Board, that is, does it appear on the methodologies page of the UNFCCC website?	Yes ☒ No ☐ NA☐ ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" Version 12.3.0. ACM0002 Version 12.3.0 is valid from 17/09/2010 to 10/05/2012(Requests for registration can be submitted until 11/01/2013). The methodology refers to the following methodological tools: • Tool for the demonstration and assessment of additionality Version 06 • Tool to calculate the emission factor for an electricity system, Version 02.2.1 Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion is not applied as the project activity does not involve fossil fuel combustion.	OK
2. If the project activity is a Small Scale one; does it qualify within the threshold of the three possible types of small scale projects? Confirm information provided in the PDD.	Not applicable	-
3. If the project activity is a Small Scale one; which approved small scale methodology does the project apply? Confirm that the SSC methodology is applied with the general guidelines to SSC CDM methodologies.	Not applicable	-
4. Determine whether the methodology selected is applicable to the project activity including that the used version is valid. Describe steps taken to assess the relevant information contained in the PDD in the table below.	The team confirmed that the methodology selected is applicable and the Version used for the proposed project activity is valid. Steps taken to assess the applicability of the methodology is detailed below:	OK

No.	Applicability conditions in the ACM0002 "Consolidated baseline methodology for	Information in the PDD	Steps taken to assess PDD information	Conclusion

	grid-connected electricity generation from renewable sources" Version 12.3.0.			
1.	This methodology is applicable to grid-connected renewable power generation project activities that (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).	The project activity involves the installation of a new wind energy based power plant in Maharashtra of 33.6 MW capacity and no renewable power plant was operated prior to the implementation of the project activity (greenfield plant). Hence, this applicability condition is met	The project involves the installation of new wind power plant/unit. LRQA has confirmed this through the site visit, review of supply quotation, purchase order and commissioning reports of the WTGs. The team confirmed that the condition is applicable to the project activity.	OK
2.	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;	The project activity is the installation of 33.6 MW wind energy based power plant in Maharashtra. Hence, this applicability condition is met	The project activity involves installation of new power plant at the site (Greenfield project). LRQA has confirmed this through the site visit, review of supply quotation, purchase order and commissioning reports of the WTGs. The team confirmed that the condition is applicable to the project activity.	OK
3.	In the case of capacity additions, retrofits or replacements (except for capacity addition projects for which the electricity generation of the existing power plant(s) or unit(s) is not affected): 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 addition or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity;	The project activity is a Greenfield setup and does not involve capacity additions, retrofits or replacements. Hence, this criterion is not applicable	The project activity involves installation of new power plant at the site (Greenfield project). LRQA has confirmed this through the site visit, review of supply quotation, purchase order and commissioning reports of the WTGs. The team confirmed that the condition is not applicable to the project activity.	OK
4.	In case of hydro power plants, one of the following conditions must apply: • The project activity is implemented in an existing single or multiple reservoirs, with	The project activity is not a hydro power project. Hence, this applicability criterion is not relevant to the project activity.	The project activity is not a hydro power project as confirmed through the document review of the supply quotation, purchase order, commissioning reports	OK

	no change in the volume of any of the reservoir; or • The project activity is implemented in an existing single or multiple reservoirs, where the volume of any reservoirs is increased and the power density of each of reservoir, as per the definitions given in the Project Emissions section, is greater than 4W/m2 after the implementation of the project activity; or • The project activity results in new single or multiple reservoirs, as per definitions given in the Project Emissions section, is greater than 4 W/m^2 after the implementation of the project activity.		of the WTGs and site visit. The team confirmed that the condition is not applicable to the project activity.	
5	In case of hydro power plants using multiple reservoirs where the power density of any of the reservoirs is lower than 4 W/m2 after the implementation of the project activity all of the following conditions must apply: • The power density calculated for the entire project activity using equation 5 is greater than 4 W/m2; • All reservoirs and hydro power plants are located at the same river and were designed together to function as an integrated project that collectively constitutes the generation capacity of the combined power plant; • The water flow between the multiple reservoirs is not used by any other hydropower unit which is not a part of the project activity; • The total installed capacity of the power units, which are driven using water from the reservoirs with a power density lower than 4 W/m2, is lower than 15 MW;	The project activity is not a hydro power project. Hence, this applicability criterion is irrelevant .	The project activity is not a hydro power project as confirmed through the document review of the supply quotation, purchase order, commissioning reports of the WTGs and site visit. The team confirmed that the condition is not applicable to the project activity.	OK

	• The total installed capacity of the power units, which are driven using water from reservoirs with a power density lower than 4 W/m2, is less than 10% of the total installed capacity of the project activity from multiple reservoirs.			
6	This methodology is not applicable for 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 continued use of fossil fuels at the site	The wind-mills are being newly installed at the project sites There is no fuel-switch from fossil fuel to renewable energy source in the proposed project activity. Hence, this criterion is not applicable	The team confirmed that the project activity is installation of wind power plant and does not fall in any of the criteria mentioned.	OK
7	This methodology is not applicable for Biomass fired power plants	The project activity does not use Biomass fired power plant. Hence, this condition is not relevant to the proposed wind project activity.	The team confirmed that the project activity is installation of wind power plant and does not fall in any of the criteria mentioned.	OK
8	This methodology is not applicable for Hydro power plants that result in new reservoirs or in the increase in existing single reservoirs where the power density of the reservoir is less than 4 W/m^2	The project activity is not a hydro power project. Hence, this applicability criterion is not relevant to the project activity.	The team confirmed that the project activity is installation of wind power plant and does not fall in any of the criteria mentioned.	OK
9	In the case of retrofits, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is .the continuation of the current situation, i.e. to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance	The project activity is a Greenfield setup and does not involve capacity additions, retrofits or replacements. Hence, this criterion is not applicable	The project activity involves installation of new power plant at the site (Greenfield project). LRQA has confirmed this through the site visit, review of supply quotation, purchase order and commissioning reports of the WTGs. The team confirmed that the condition is not applicable to the project activity	OK
Applicability condition of "Tool to calculate the emission factor for an electricity system"				
	The geographic and system boundaries for the relevant electricity grid can be clearly identified and information on the characteristics of the grid is available.	The geographic and system boundaries of the project connected electricity grid (the NEWNE Grid of India) can be clearly identified. Official information on the characteristics of the grid is also available. Details are provided in the PDD Section B.6.1.	Central Electricity Authority, Ministry of Power, Government of India (Host Country) has given the delineations of the project electricity system and the connected electricity system in India that meet the requirements of the Tool.	OK

	Validated situation	Conclusion
5. Confirm that any specific guidance provided by the CDM Executive Board in respect to an approved methodology has been correctly applied.	The approved methodology specifies clear criteria to check the applicability conditions and each condition were checked as detailed above.	OK
6. If a determination regarding the applicability of the selected methodology to the proposed CDM project activity cannot be made, request clarification of the methodology in line with the guidance provided by the CDM Executive Board. Describe the clarification request and response.	Not Applicable	-
7. If the Validation Team determines that the proposed CDM project activity does not comply with the applicability conditions of the methodology, the Team may proceed by means of requesting revision to or deviation from the methodology in line with the guidance provided by the CDM Executive Board. Describe the request for revision or deviation and approval by the CDM Executive Board.	Not Applicable	-
8. If there are any GHG emissions occurring within the proposed CDM project activity boundary, which are not addressed by the applied methodology and which are expected to contribute more than 1% of the overall expected average annual emissions reductions as a result of the implementation of the project but a determination is made that the approved methodology(ies) is / are applicable to the project activity, provide here information about them in relation to the applicability criteria and justify the determination.	The validation of the project activity did not reveal any other greenhouse gas emissions occurring within the proposed project activity boundary as a result of the implementation of the proposed CDM project activity which is expected to contribute more than 1% of the overall expected average annual emission reduction, which are not addressed by ACM0002 Version 12.3.0. This is in accordance with paragraph 77 of CDM VVM (Version 01.2)	OK

	Validated situation	Conclusion
SECTION 5a. Project boundary		

	Validated situation	Conclusion
1. Does the project boundary include physical, geographical site of the industrial facility, processes, or equipment that are affected by the project activity?	Yes ☒ No ☐ NA☐	OK
2. Confirm that all sources and GHGs required by the methodology have been included within the project boundary. Describe here if any emission source that will be affected by the project activity and is not addressed by the approved methodology, has been identified. In such case request clarification of, revision to or deviation from the methodology in accordance with EB guidance. Use the table below for this purpose:	The project boundary has been validated through the review of purchase order, commissioning certificates, and also by means of physical site visit & interviews with the technology supplier, site personnel. Commissioning certificates the location number as given below: a. Locations at JAI-02, JAI-03 dated 02/04/2011 b. Location at JAI-04 dated 07/09/2011 c. Location at JAI-05,JAI-07,JAI-08 dated 18/03/2011 d. Location at JAI-09, JAI-11, JAI-19, JAI-22,JAI-23 dated 02/04/2011 e. Location at JAI-18, JAI-21, JAI-27, JAI-28, JAI-29 dated 18/03/2011 The validation has determined that the delineation of the project boundary in the revised PDD is correct and meets the requirements of the applicable methodology. Section A.2 of the PDD Version 01.1 referred to NEWNE as the grid however the project boundary diagram presented in section B.3 refers to "MSEDCL" as the grid. A CL02 was raised, PP has revised PDD. CL02 was closed. All sources and gases required by the applied methodology have been included within the project boundary. The validation team has confirmed that the project boundary is clearly defined and complies with the requirement of the methodology.	OK ~~CL02 was closed~~

Gases and Sources Included In The Project Boundary						
	Source	**Gas**	**Inc./Exc. Pdd**	**Justification PDD**	**Steps Taken To Assess PDD Justification**	**Conclusion**
BASELINE	CO_2 emissions from electricity generation in fossil fuel	CO_2	Yes	Main emission source	The project activity aims at generating electricity using wind energy supplying to the NEWNE grid which is mainly supplied by fossil fuel based power plants. The project activity will reduce CO_2 emission from power generation by the grid connected	OK

	fired power plants that is displaced due to the project activity				power plants based on fossil fuels. The project activity will also reduce CH_4 and N_2O emissions from power generation by the grid connected power plants based on fossil fuels but the emissions are minor in volume and reasonable to be excluded for simplification and it is more conservative	
		CH_4	No	Minor emission source	NA	NA
		N_2O	No	Minor emission source	NA	NA
PROJECT	For geothermal power plants, fugitive emissions of CH_4 and CO_2 from non-condensable gases contained in geothermal steam.	CO_2	No	The present project activity is a Greenfield wind power project. Hence, not relevant	The validation team has confirmed that project activity involves wind power project capacity of 33.6MW (16WTGs of each 2.1MW capacity) which is a Greenfield project. This condition is not relevant.	OK
		CH_4	No	Minor emission source	NA	NA
		N_2O	No	Minor emission source	NA	NA
	CO_2 emissions from combustion of fossil fuels for electricity generation in solar	CO_2	No	The present project activity is a Greenfield wind power project. Hence, not relevant	The validation team has confirmed that project activity involves wind power project capacity of 33.6MW (16WTGs of each 2.1MW capacity) which is a Greenfield project. This condition is not relevant.	OK
		CH_4	No	Minor emission source	NA	NA

	thermal power plants and geothermal power plants	N_2O	No	Minor emission source	NA	NA
	For hydro power plants, emissions of CH_4 from the reservoir.	CO_2	No	The present project activity is a Greenfield wind power project. Hence, not relevant	The validation team has confirmed that project activity involves wind power project capacity of 33.6MW (16WTGs of each 2.1MW capacity) which is a Greenfield project. This condition is not relevant.	OK
		CH_4	No	Minor emission source	NA	NA
		N_2O	No	Minor emission source	NA	NA

	Validated situation	Conclusion
SECTION 5b. Baseline identification		
1. Determine whether the PDD provides a verifiable description of the identified baseline scenario, including a description of the technology that would be employed and/or the activities that would take place in the absence of the proposed CDM project activity.	The PDD provides the description of identified baseline scenario which would have been undertaken in absence of the proposed project activity and inline with the applied methodology requirements.	OK
2. Confirm that any procedure contained in the methodology to identify the most reasonable baseline scenario, has been correctly applied.	Yes ☒ No ☐ NA☐ According to ACM0002, Version 12.3.0, the baseline for the project activity is the kWh of electricity produced by the renewable generating unit. The baseline scenario is the electricity delivered to the grid by the project activity that otherwise would have been generated by the operation of grid-connected power plants and by the addition of new generation sources. Since this baseline scenario is prescribed by the approved methodology, this is acceptable in accordance with the requirements of clause 105 of CDM VVM Version 01.2.	OK

	Validated situation	Conclusion
3. Check each step in the procedure described in the PDD to identify the baseline scenario against the requirements of the methodology. (Note that if the methodology requires use of tools, that is, such as the tool for the demonstration and assessment of additionality and the combined tool to identify the baseline scenario and demonstrate additionality, the guidance in the methodology shall supersede it in the tool.)	As confirmed above	OK
4. Based on financial expertise and local and sectoral knowledge, determine whether all scenarios that are considered by the project participants and are supplementary to those required by the methodology, are reasonable in the context of the proposed CDM project activity and that no reasonable alternative scenario has been excluded. Use the table below for this purpose:	Since this baseline scenario is prescribed by the approved methodology, this is acceptable in accordance with the requirements of clause 105 of CDM VVM Version 01.2.	OK

Alternative Scenario Ref.	Description in the PDD	Cross-checked with	Validation Opinion
Not Applicable			-
Not Applicable			-

5. Determine whether the baseline scenario identified is reasonable by validating the assumptions, calculations and rationales used, as described in the PDD. It shall be ensured that documents and sources referred to in the PDD are correctly quoted and interpreted. Cross check the information provided in the PDD with other verifiable and credible sources, such as local expert opinion. The table above may be used for this purpose.	The baseline scenario is in accordance with the applied methodology ACM0002 Version 12.3.0. Since this baseline scenario is prescribed by the approved methodology, this is acceptable in accordance with the requirements of clause 105 of CDM VVM Version 01.2.	OK

6. Is the identified baseline scenario in line with regulatory or legal requirements and does it take into account relevant national and/or sectoral policies?	The identified baseline scenario is in line with the regulatory / legal requirements as prescribed by the applied methodology.	OK
7. Is this identification supported by official and/or verifiable documents (for example, studies, web pages, certificates, etc)?	As the baseline scenario is as per the applied methodology this is not applicable.	OK

	Validated situation	**Conclusion**
SECTION 5c. Algorithms and/or formulae used to determine emission reductions		
1. Compare the equations and parameters in the PDD to those in the selected approved methodology and determine if they have been correctly applied to calculate project emissions, baseline emissions, leakage, and emission reductions. Confirm that adequate justification has been provided for selection between different options.	**Baseline emissions** According to the methodology ACM 0002 Version 12.3.0, for new grid connected renewable power plant, the baseline emissions are the product of electricity produced by renewable energy generating unit multiplied by the emission factor of the grid. $BE_y = EG_{PJ,y} \cdot EF_{grid,CM,y}$ $EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh) $EF_{grid, CM, y}$ = Combined margin CO2 emission factor for grid connected power generation in year y calculated using the latest version of the .Tool to calculate the emission factor for an electricity system. (tCO2/MWh) The equation used for calculation of baseline emission is in line with equation no 6 of the applied methodology and is appropriate. Calculation of $EG_{PJ,y}$ Since the project activity is the installation of a new grid-connected renewable power	OK ~~CAR06 was closed~~

	Validated situation	Conclusion
	plant/unit at a site where no renewable power plant was operated prior to the implementation of the project activity, then: $EG_{PJ,y} = EG_{facility,y}$ This is in line with equation no (7) of the applied methodology and is appropriate Calculation of the emission factor ($EF_{grid, CM, y}$) The baseline emission factor is calculated as a Combined Margin (CM) consisting of Operating Margin (OM) and Build Margin (BM) factors based on data from an official source publicly available. The CM emission factor (EF) for the displaced electricity was calculated based on the 'Tool to calculate the emission factor for an electricity system' Version 02.2.1 (hereinafter referred to as "the tool"), in accordance with the applied methodology. The PP uses the EF for the grid electricity as calculated in CO_2 Baseline Database for the Indian Power Sector published by the Central Electricity Authority (CEA), Ministry of Power, and Government of India. The CEA publishes on an annual basis the General Review and the Performance Review of Thermal Power Stations which is used by the majority of CDM project promoters. The database for baseline estimation issued by the CEA has been developed consistently with the availability of data in India. The database is an official publication of the Government of India for the purpose of CDM baselines. The CEA Database Version 6.0 has been applied as it was current at the time of submission of the PDD for validation. The step wise estimation of Combined Margin Emission Factor is provided as below: **Step 1** of the *tool* requires identification of the relevant electric power system. In line with the requirements specified in the tool, the PP has selected the regional grid based on the spatial extent of the power plants that are physically connected through transmission and distribution lines to the project activity. The Indian electricity system is divided into two grids, the Integrated Northern, Eastern, Western, and North-Eastern regional grids (NEWNE) and the Southern Grid. Each grid covers several states. Since the project activity is located in the Maharashtra region, the selection of the NEWNE Grid (which includes the state of Maharashtra) for the purpose of estimation of baseline emission factor is considered appropriate. Therefore, the validation team confirmed the applicability of Step 1 of the *tool*.	

	Validated situation	Conclusion
	Step 2 of the *tool* gives the PP an option to include off-grid power plants in the project electricity system. The PP has chosen only grid power plants for analysis. **Step 3** of the *tool* requires selection of a method for estimation of operating margin. Of the four methods provided in the *tool* for calculating the operating margin ($EF_{grid,OM,y}$), the PP has selected simple OM method since the low-cost/must-run resources constitute less than 50% of total grid generation on average of the five most recent years, i.e from 2005-06 to 2009-10. Low operating cost/must run resources include hydro and nuclear. The tool provides two options – (i) ex-ante option and (ii) ex-post option in calculating the simple OM. With regards to data vintage, the project participant wishes to use the Ex-post option wherein the emission factor is determined for the year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring as per the procedure given in the tool. **Step 4** of the *tool* requires the calculation of the operating margin emission factor according to the Simple OM method chosen as per Step 3 above. EF_{gridOM}= 0.9942 tCO_2/MWh **Step 5** of the *tool* requires calculation of the build margin emission factor. Identification of the group of power units to be included in the Build Margin. The sample group of power units m selected for calculation of the build margin consists of the set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently. The data pertaining to the units thus identified are detailed in the Version 6.0 of the Baseline Carbon Dioxide Emissions database of the Central Electricity Authority (CEA) With regards to data vintage, the project participant wishes to use the Option 2 viz. Ex-post option. For the first crediting period, the build margin emission factor shall be updated annually, ex post, including those units built up to the year of registration of	

	Validated situation	Conclusion
	the project activity or, if information up to the year of registration is not yet available, including those units built up to the latest year for which information is available. For the second & third crediting period, the build margin emissions factor shall be calculated as described in the latest version of the 'Tool to calculate the Emission Factor for an electricity system' The CEA database provides a BM value for the NEWNE grid as 0. 8123 tCO_2/MWh. **Step 6** of the *tool* requires calculation of the combined margin emission factor as per the following equation: $EF_{CO2,grid,y} = EF_{grid,OM,y} \times w_{OM} + EF_{grid,BM,y} \times w_{BM}$ According to the guidance on selecting alternative weights in the tool, the default weights applicable for wind projects are w_{OM} = 0.75 and w_{BM} = 0.25 for the first and subsequent crediting period have been applied. The baseline grid emission factor has been calculated as; $EF_{CO2,grid,y} = EF_{grid,CM,y}$ = 0.9487 tCO_2/MWh The baseline emissions thus can be estimated as: $BE_y = EG_{BL,y} \times EF_{CO2,grid,y}$ = x 55,759MWh x 0. 9487 tCO_2e/MWh = 52,898 tCO_2e Annual average baseline emission is estimated to be 52,898 tCO_2e. Ex-ante electricity generation has been evaluated based on 'Guidelines for the reporting and validation of plant load factors' Version 01, Annex 11, and CDM EB report of its 48th meeting. **Project emissions (PE_y)** According to the chosen baseline methodology ACM0002, for wind energy based renewable energy project activities, PEy = 0 **Leakage (LE_y)** No leakage emissions are considered.as per the methodology Hence, LE_y = 0	

<table>
<tr><th></th><th>Validated situation</th><th>Conclusion</th></tr>
<tr><td></td><td>As no project emission (PE_y) or leakage (LE_y) is considered for the project activity, the estimated baseline emission (BE_y) becomes the emission reduction (ER_y), i.e;
$PE_y = 0$
$LE_y = 0$
<u>Emission reductions</u>

As provided in the methodology, emission reduction is calculated from the equation:

$ER_y = BE_y - PE_y$

The equation used for calculation of emission reduction is in line with equation (11) of the applied methodology and is appropriate.

ER_y: Emission Reductions in the year y (tCO_2e/y
BE_y: Baseline emissions in the year y (tCO_2e/y)
PE_y: Project emissions in the year y (tCO_2e/y)

The annual emission reductions from the project activity can be estimated as the difference between the baseline emissions and the project emissions as follows:

$ER_y = BE_y - PE_y$

$ER_y = 52,898 - 0$
$= 52,898\ tCO_2e$

The steps used for calculation of the baseline emission factor section B6.1 were not inline with the requirements of the Version 2.2.1 of the Tool and the values of build margin emission factor were not consistent. Hence CAR06 was raised. PP has addressed the CAR06 and the calculation methodology for baseline emission factor is in line with the requirements, Hence CAR06 was closed.</td><td></td></tr>
<tr><td>2. Verify the justification given in the PDD for the choice of data and parameters used in the equations to determine estimated emission reductions.</td><td><table><tr><th>Data/Parameter title: $\mathbf{EF_{grid,CM,y}}$</th><th>Comments</th></tr><tr><td>Title in line with methodology?</td><td>Yes ($EF_{CO2,grid,y} = EF_{grid,CM,y}$) and hence found to be OK.</td></tr><tr><td>Fixed throughout the crediting period?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr></table></td><td>OK
<s>CAR06 was closed</s></td></tr>
</table>

	Validated situation		Conclusion
If data and parameters will not be monitored throughout the crediting period and will remain fixed, assess that all data sources and assumptions are appropriate and calculations are correct, applicable to the proposed CDM project activity and will result in a conservative estimate of the emission reductions. If data and parameters will be monitored on implementation and hence become available only after validation of the project activity, confirm that the estimates provided in the PDD for these data and parameters are reasonable. List all data and parameters provided in the PDD in the tables in next column.	Appropriate description of parameter?	Yes	
	Source clearly referenced?	Yes, CEA database Version 6	
	Value provided is considered reasonable?	Yes, 0.9487	
	Has this value been verified?	Yes, verified with the CEA database Version 6.	
	Choice of data correctly justified?	Yes	
	Measurement method correctly described?	NA	
	Data/Parameter title: $\mathbf{EF_{grid,OM,y}}$	Comments	
	Title in line with methodology?	Yes	
	Fixed throughout the crediting period?	Yes	
	Data unit correctly expressed?	Yes	
	Appropriate description of parameter?	Yes	
	Source clearly referenced?	Yes, CEA database Version 6	
	Value provided is considered reasonable?	Yes, 0.9942	
	Has this value been verified?	Yes, verified with the CEA database Version 6	
	Choice of data correctly justified?	Yes	
	Measurement method correctly described?	NA	
	Data/Parameter title: $\mathbf{EF_{grid,BM,y}}$	Comments	
	Title in line with methodology?	Yes	
	Fixed throughout the crediting period?	Yes	
	Data unit correctly expressed?	Yes	
	Appropriate description of parameter?	Yes	
	Source clearly referenced?	Yes, CEA database Version 6	
	Value provided is considered reasonable?	Yes, 0.8123	
	Has this value been verified?	Yes, verified with the CEA database Version 6	
	Choice of data correctly justified?	Yes	
	Measurement method correctly described?	NA	

	Validated situation	Conclusion
	The grid emission factors have been verified with the CEA database available at the site http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm	
3. Confirm that all assumptions and data used by PPs are listed in the PDD including their references and sources, and that the documentation used as the basis for these assumptions and source of data is correctly quoted and interpreted in the PDD.	Yes, all assumptions and data used by the PP are listed in the PDD including their references and sources The grid emission factor is calculated based on the CO_2 Baseline Database for the Indian Power Sector published by the Central Electricity Authority (CEA), Ministry of Power, Government of India (http://cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm	OK
4. Confirm that all estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.	Validation team confirms that the estimate of baseline emissions can be replicated using the data and parameter values provided in the PDD.	OK

	Validated situation	Conclusion
SECTION 6. Additionality of a project activity		
1. Does the PDD clearly describe how the proposed CDM project activity is additional?	Yes ☒ No ☐	OK
2. List the documents and tools provided by the CDM Executive Board used to demonstrate the additionality	"*Tool for demonstration and assessment of Additionality"* Version 06.0.0	OK

	Validated situation	Conclusion
SECTION 6a. Prior consideration of the clean development mechanism		
1. Does the PDD clearly indicate the start date of the project activity in format: dd/mm/yyyy, and is it in line with the Glossary of CDM Terms?	Yes ☒ No ☐ The start date of the project has been considered as 05/08/2010 i.e. The date of purchase order raised on technology supplier, i.e Suzlon. LRQA has validated the start date in accordance with Glossary of CDM terms version 05, through the review of purchase order with technology supplier for WTG, commissioning certificates.	OK
If the PDD was published for Global Stakeholder Consultation process after the start date, check that the CDM benefits were considered necessary in the decision to undertake the project activity as a CDM project, following the below queries.		

	Validated situation	Conclusion
2. For a project activity with a start date on or after the 02 August 2008, confirm that the PPs have informed the host party DNA and the UNFCCC secretariat in writing of their intention to seek CDM Status. If such a notification has not been provided by the PPs within six months of the project activity start date, determine that the CDM was not seriously considered in the decision to implement the project activity.	As the start date was after 02/08/2008, in accordance with the "Guidelines on the demonstration and assessment of prior consideration of the CDM" the PP had informed the Host Party DNA and the UNFCCC secretariat on 01/07/2010, on their intention to seek CDM status, even before the placement of purchase order.(start date). The validation team has reviewed the copy of the prior consideration form that has been sent to the UNFCCC, subsequent confirmation mail from UNFCCC dated 21/07/2010 and from list of notifications received by the UNFCCC from the UNFCCC website. The prior CDM consideration for the project activity had been sent on 01/07/2010 which is after the decision making date that is, 06/04/2010 and before placement of purchase order (05/08/2010). F-CDM dated 23/06/2010 did not contain the precise location of the site. This was discussed during the site visit. As the PP had not finalised the location for the project activity and also the purchase orders were not issued, the locations with geo-coordinates of the sites were not precisely mentioned in the F-CDM form. The location details given in the PDD have been verified through the commissioning certificates of WTGs. The timeline in section B.5 of the PDD Version 01.1 did not include the date of notification to host country DNA, CAR05 was raised. PP has now included in the revised PDD, hence CAR05 was closed. Refer Findings log at the end of the report for details on the closure of the finding. The validation team confirmed that the PP has communicated the prior CDM consideration of the project activity to the NCDMA through mail dated 01/07/2010. The validation team had confirmed the name of the project activity in the list of notifications received by the UNFCCC available from the UNFCCC website. Thus, LRQA confirms that the CDM was seriously considered in the decision to implement the project.	OK ~~CAR05 was closed~~

	Validated situation	Conclusion
3. For a project activity with a start date before 02 August 2008, check the following requirements through document reviews to assess the PPs prior consideration of the CDM: (a) Evidence that must indicate that awareness of the CDM before the project activity start date, and that the benefits of the CDM were a decisive factor in the decision to proceed with the project. (b) Reliable evidence from project participants that must indicate that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation. The time gap between the documented evidence of prior CDM consideration and continuing and real actions shall be within the period required by the Guidance on prior consideration of the CDM. If evidence to support the serious prior consideration of the CDM as indicated above that is authentic is not available, determine that the CDM was not considered in the decision to implement the project activity.	Not Applicable	-

	Validated situation	Conclusion
SECTION 6b. Identification of alternatives		
1. Does the PDD identify credible alternatives to the project activity, to determine the most realistic baseline scenario? Assess this list of alternatives and ensure that: (a) The list of alternatives includes as one of the options that the project activity is undertaken without being registered as a proposed CDM project activity. (b) The list contains all plausible alternatives considered to be viable means of supplying the outputs or services that are to be supplied by the proposed CDM project activity. (c) The alternatives comply with all applicable and enforced legislation.	LIST OF ALTERNATIVES No | Description in the PDD | Describe why it is credible and complete | | | | | | Not Applicable The PP has demonstrated the financial unattractiveness of the project activity through investment barrier by applying the benchmark analysis. Since the baseline for the project activity is electricity supplied by the grid which is outside the direct control of the project developer, the choice of benchmark approach for demonstration of Additionality is relevant.	-

	Validated situation	Conclusion
SECTION 6c. Investment analysis		

	Validated situation	Conclusion
1. Verify the accuracy of financial calculations carried out for the investment analysis: (a) Conduct a thorough assessment of all parameters and assumptions used in calculating the relevant financial indicator, and determine the accuracy and suitability of these parameters. (b) Cross-check the parameters against third-party or publicly available sources, such as invoices or price indices. (c) Review feasibility reports, public announcements and annual financial reports related to the proposed CDM project activity and the project participants.	PP has demonstrated additionality by applying the investment barrier in accordance with the "*Tool for demonstration and assessment of Additionality*" Version 06.0.0. The tool provides step wise approach to demonstrate Additionality. A thorough assessment of all parameters and assumptions used in the financial analysis was conducted by the validation team. The parameters were cross-checked with relevant sources. The details on the validation of input parameters and assumptions are presented in the below table	OK ~~CAR03, CAR04 & CL03 were closed.~~

	Validated situation	Conclusion
2. Assess the correctness of computations carried out and documented by the project participants	The validation team has assessed the correctness of the calculations that were carried out by the PP. CAR03, 04 & CL03 were raised during the review and assessment of the financial parameters of the investment analysis. The resolution is detailed in the findings section of this protocol. IRR was computed for a period of 20 years, which reflects the period of expected operation of the underlying project activity (technical lifetime) and hence was found to be appropriate. LRQA confirms that the salvage value (fair value of any project activity assets at the end of the assessment period) is added back as cash inflows in accordance with guidance 4 of 'Guidelines on the Assessment of Investment Analysis'. Further, LRQA confirms that the tax computation considers benefit under section 80 IA of the Income Tax Act under which such projects are entitled for tax holiday for 10 consecutive years out of the first 15 years. As per Section 80 IA of Income Tax Act – Reduction in respect of profits and gains from industrial undertaking or enterprises engaged in infrastructure development etc. under which a deduction of an amount equal to 100% of the profit and gain derived from such business is allowed for any ten consecutive years out of fifteen years beginning from the year in which the undertaking or enterprise generates power or commences transmission or distribution of power. In accordance with guidance 5 of 'Guidelines on the assessment of investment analysis', LRQA confirms that the depreciation and interest payment, have been added back to net profits for the purpose of calculating the IRR. PP had presented the unprotected spreadsheet versions of all investment analysis, having readable formulas. LRQA could confirm that the investment analysis is presented in a transparent manner, to the extent that the reader can reproduce the results. It was confirmed by the validation team from the available evidence and relevant accounting practices that in the estimation of the post tax Equity IRR, the PP had applied the accepted local accounting and taxation principles. Also, LRQA confirms that all the input values considered for the investment analysis were applicable at the time of investment decision taken by the project participant and it is in compliance with the guidance 6 of the Guidelines on the assessment of the investment analysis Version 5. Also, the assessment of input parameters has been confirmed in accordance to paragraph 110 & 111 of VVM Version 1.2 The equity IRR calculated with the input parameters as provided below work out to 10.71% for the project activity without considering the benefits from the CDM revenue which is less than the benchmark of 19.75%.	OK ~~CAR03, CAR04 & CL03 were closed.~~

<table>
<tr><th></th><th>Validated situation</th><th>Conclusion</th></tr>
<tr><td>3. Assess the sensitivity analysis by the project participants to determine under what conditions variations in the result would occur, and the likelihood of these conditions.</td><td>Power generation, O&M cost, power tariff and capital cost are the critical parameters affecting the IRR and are correctly selected for sensitivity analysis.

<table>
<tr><th rowspan="2">Parameter Varied for IRR w/o CDM</th><th colspan="2">Variation</th></tr>
<tr><th>10%</th><th>-10%</th></tr>
<tr><td>Generation</td><td>12.67%</td><td>8.71%</td></tr>
<tr><td>O&M</td><td>10.44%</td><td>10.97%</td></tr>
<tr><td>Tariff</td><td>12.69%</td><td>8.69%</td></tr>
<tr><td>Capital Cost</td><td>9.19%</td><td>12.50%</td></tr>
</table>
The equity IRR of the project activity is 10.71% (the calculation is presented in IRR sheet) without considering CDM revenues. The sensitivity analysis shows that the IRR is not affected by the varying critical parameters by ±10% and within the benchmark applied for (19.75%).

CAR04 was raised, since PP had assumed the tariff rate for electricity by calculating the average tariff rate for year 2007-08, 2008-09 and 2009-10 and not the current tariff rate with appropriate escalation. PP clarified that they had considered the average tariff based on their electricity bills and the same was considered during decision making. Further PP has clarified that even after applying an escalation rate for the tariff the IRR would not cross the benchmark, this is now presented in the revised PDD. The validation team has reviewed the computation of escalation rate which is based on the past trend of increase in tariff and is based on the tariff issued by MSEDCL in their High Tension tariff booklets in year 2006 and 2010. Using CAGR an escalation rate of 3.06% was computed. Even after applying an escalation rate of 3.06% to the tariff of 5.39 INR/KWh, IRR is which is well within the benchmark. Hence the finding is closed.</td><td>OK
~~CAR04 was closed~~</td></tr>
</table>

Use the table below to list all the inputs to the investment analysis and to describe how each parameter has been validated:

Parameter/input	Symbol/Unit	Value	Source	Means of validation	Conclusion
Project capacity	MW	37.8 (18nos x2.1MW	Quotation from supplier	The capacity of WTG was verified from the supplier quotation dated 12/03/2010.The quotation was sought for 18 WTGs of 2.1MW capacity each. A clarification (CL03) was raised seeking the reason for the implementation of the project activity with 33.6MW (16nos. WTG of 2.1MW	OK ~~CL03 was closed.~~

		each)		each), while initially conceptualised for 18 WTGs. PP clarified that they have decided to implement the project with 16 WTGs based on the availability of the finance. The team has cross checked the minutes of the meeting dated 06/04/2010, which mentioned that the committee did approve for 18 wind mills offered by Suzlon at Jaibhim site, Dhule, Maharashtra. The team has cross checked the following documents 1. Supplier offer for supply of wind power project between SIIL & Suzlon dated 12/03/2010 2. Purchase Order dated 05/08/2010 which specified that 18nos. of each 2.1MW capacity 3. Amended Purchase Order dated 28/10/2010 & 01/11/2010 for 17 nos. of WTG of each 2.1MW capacity 5. Commissioning certificates the location number as given below: a. Locations at JAI-02, JAI-03 dated 02/04/2011 b. Location at JAI-04 dated 07/09/2011 c. Location at JAI-05,JAI-07,JAI-08 dated 18/03/2011 d. Location at JAI-09, JAI-11, JAI-19, JAI-22,JAI-23 dated 02/04/2011 e. Location at JAI-18, JAI-21, JAI-27, JAI-28, JAI-29 dated 18/03/2011 Though 18nos.WTGs was proposed to be implemented initially and accordingly it was approved in the Board meeting, the PP has installed only 16 WTGs as verified from the Purchase Order dated 05/08/2010 (18nos), amended PO dated 28/10/2010 & 01/11/2010 for 17 nos. The validation team has finally confirmed from the commissioning certificates and through site visit that PP has implemented 16nos. WTGs of each 2.1MW capacity under the project activity.	
Project cost	Million INR	2160	Quotation from supplier	The project cost was sourced from the supplier quotation dated 12/03/2010. The quotation specifies a total price of INR 2160 million for 18nos.of WTG including supply of materials, labour and services, identification, selection and allocation of land, obtaining all Government permissions etc. At the time of decision making, the project participant had envisaged a project activity involving the installation of 18 WTGs of 2.1 MW each. However, the PP had to exclude two WTG locations (Location no: JAI-06 and JAI-01) due to constraints faced by the WTG supplier in procurement of land for their commissioning. Therefore, only 16 WTGs were commissioned out of the 18 WTGs that were initially conceptualised. The validation team has confirmed the	OK

				commissioning of the 16 nos. of WTGs through the commissioning certificates and the site visit observation. The commissioning certificates have been provided in the Appendix B. As per paragraph 6 of the Guidelines on the assessment of investment analysis, EB 65, Annex 05, *'Input values used in all investment analysis should be valid and applicable at the time of the investment decision taken by the project participant'*. Therefore, for the purpose of investment analysis of the project activity, all the input parameters are as per those available at the time of decision making. Thus, the project cost considered as INR 2160 million (as per the offer from WTG supplier dated 12/03/2010 is available at the time of decision making). The validation team confirmed that even if 16 WTGs are considered for all the input parameters, the result of the investment analysis and additionality will not change as both revenues and costs will change proportionately and the additionality is retained.	
O & M cost & escalation per annum	Million INR /year/WTG % per annum	2.1 5%	Quotation from supplier	O & M cost was sourced from the supplier quotation dated 12/03/2010, which specifies the O & M charges with spares and consumables will be INR 2.1 million per WTG from 2nd year with 5% annual escalation each year thereafter till 6th year (total O & M cost during 2nd year is 1.75% of project cost). . A CL03 was raised, as the PP did not mention the source for the O & M costs in the IRR sheet and the basis of escalation. PP has specified the O & M costs sourced from the supplier quotation, based on this quotation, the escalation of 5% is considered annually up to the 6th year of the project activity and the same escalation rate is considered for the project lifetime of 20 years. The PP had not signed any O&M agreement during the validation and could not be compared with the actual cost. The team has cross checked the MERC tariff order dated 24/11/2003(http://www.infraline.com/power/setup/MAHOrders_files/WindEnergyOrder241103.pdf) which specified O & M costs of 1.5% of the project cost for first three years and 2% of project cost from 4th year onwards. Validation team confirmed the total O&M cost for the project life of 20 years is INR 1154.374 million calculated based on the quotation from the supplier dated 12/03/2010, while the total O&M cost calculated as per MERC tariff order dated 24/11/2003 is 1213.504 million for the 20 year period. Hence, the O&M cost considered in the project activity is deemed conservative and results in a higher IRR (10.71%) as compared to O&M cost as per MERC order which results in lower IRR (10.51%). The validation team deems the O&M cost of INR 2.1 million/WTG/annum and escalation of 5% from 2nd year onwards to be reasonable and appropriate. CL03 was closed.	OK ~~CL03 was closed~~

Free O & M service	years	1	Quotation from supplier	PP has sourced the value from the supplier quotation dated 12/03/2010. The PP had not signed any O & M agreement during the validation period and the actual period could not be verified. However, the validation team has confirmed that free O & M period used in the investment analysis is reasonable.	OK
Net annual generation	MWh/WTG	3600	Quotation from supplier	The estimated net generation was sourced from the supplier quotation available at the time of decision making. Supplier quotation dated 12/03/2010 specified the net generation would be 3600 MWh/WTG. (Refer to section xi page 4 of offer). A CL03 was raised, as the source of the estimate net generation was not specified in the IRR sheet. The DoE has cross checked the estimation of energy generation from the techno commercial evaluation PLF study by a third party Consolidated Energy Consultants Limited (CECL) report dated 22/05/2010. The report specifies a net generation (average of 18WTGs) of 3,485 MWh/WTG with a CUF of 18.94%. (Refer to section 9 of page 14 and table 3 of page 23). The validation team confirmed that the PLF assessment by the third party is in accordance with option 3(b) of the "Guidelines on Reporting and Validation of the Plant Load Factors" Version 01. PLF considered by the PP in investment analysis based on the supplier quotation 3,600MWh/WTG is higher than estimated generation by the third party (specific to the site-18.94% with 3485MWh/WTG) however since the value is considered to be conservative for the financial analysis and hence accepted. PLF has been subjected to the sensitivity analysis with 10% variation on either side. The validation team has also cross checked the Maharashtra Electricity Regulatory Commission (MERC) Order dated 24/11/2003, clause no.2.2.2B http://www.infraline.com/power/setup/MAHOrders_files/WindEnergyOrder241103.pdf which specifies a CUF of 20% for the new projects commissioned after 01/04/2003. PP has considered the transmission losses of 4.85% and wheeling losses of 6% in the IRR calculations which is as per the supplier quotation and CECL study report. The validation team has confirmed the net annual generation used for the project investment analysis is appropriate and conservative.	OK ~~CL03 was closed.~~
Energy Savings rate	INR/KWh	5.39	Calculated from the electricity bills of years 2007-	The PP has considered actual energy rate paid by the organisation during the year 2007-08, 2008-09, 2009-10 for the calculation of average energy savings rate. A CL03 was raised as the PP did not clarify how this average past rate can be considered standard in the market	OK ~~CL03 was closed~~

			08, 2008-09, 2009-10	The electricity bills supporting the tariff rates have been reviewed by the validation team and found to be appropriate. It was confirmed that even if the highest rate per unit (6.64 INR/KWh as confirmed from the bill of November 2007) is assumed to calculate the savings, the IRR works out to be 15.38% which is still within the benchmark. The energy savings rate considered by the PP is found to be appropriate.	
Wheeling losses Wheeling charges	% INR/KWh	6 0.05	MERC order dated 17/08/2009	The PP has sourced the wheeling losses and wheeling charges from the Maharashtra Electricity Regulatory Commission (MERC) order dated 17/08/2009, clause 5.6, and page 217. This is available during the decision making and is appropriate. MERC order dated 17/08/2009, clause 5.6 (page 217 of 249) specifies the wheeling charges applicable to the consumers connected at the various voltage levels on MSEDCL distribution network during 2009-10 are summarised in terms of INR/kWh and wheeling charges come into effect from the date of issuance of this tariff order. As per clause no. 5.9 “this order shall come into force with effect from 01/08/2009”. PP has considered the wheeling charge of 0.05 INR/kWh and wheeling loss of 6% for a 33kV line. The project activity involves the installation of a new wind energy based power plant in Maharashtra of 33.6 MW capacity. The generated electricity is wheeled to substation through a 33 kV overhead line and will be utilized by the project participant for captive use. Thus, the generated electricity is wheeled through the regional grid for captive use which is a High Tension (HT) (33kV) Industrial Facility. The transmission and wheeling losses are parameters relevant to the type of renewable energy consumer rather than the renewable energy generator. The MERC order dated 24/11/2003 is applicable to renewable energy generators while the MERC order dated 17/08/2009 is applicable to renewable energy consumers. Thus, the validation team confirmed that the MERC order dated 24/11/2003 is not relevant to the project activity and hence, MERC order dated 17/08/2009 has been used by the PP is appropriate and available at the time of decision making. The validation team also confirmed from the actual credit notes dated 14/03/2012 (February 2012 month) received by the PP indicates State Electricity Utility (MSEDCL) is charging a wheeling loss of 9%, hence the wheeling loss of 6% considered by the PP is conservative. Noted the recent actual credit notes dated 17/09/2012 indicates the transmission loss is changed to 6% by MSEDCL (with effect from 05/09/2012), which is the same value considered	OK ~~CL03 was closed.~~

				by the PP and hence the value considered by the PP is appropriate. In the initial financial calculation sheet, the calculation of wheeling and transmission losses from 2nd year onwards was not linked with 'assumptions' sheet (IRR analysis) hence CL03 was raised. PP has revised the sheet with linkages. Hence, CL03 was closed.	
Transmission losses	%	4.85	MERC order dated 17/08/2009	The PP has sourced the transmission losses from the Maharashtra Electricity Regulatory Commission (MERC) order dated 17/08/2009, clause 4.4, and page 116. This is available during the decision making and is appropriate. The project activity involves the installation of a new wind energy based power plant in Maharashtra of 33.6 MW capacity. The generated electricity is wheeled to substation through a 33 kV overhead line and will be utilized by the project participant for captive use. Thus, the generated electricity is wheeled through the regional grid for captive use which is a High Tension (HT) (33kV) Industrial Facility. The transmission and wheeling losses are parameters relevant to the type of renewable energy consumer rather than the renewable energy generator. The MERC order dated 24/11/2003 is applicable to renewable energy generators while the MERC order dated 17/08/2009 is applicable to renewable energy consumers. Thus, the validation team confirmed that referring the MERC order dated 17/08/2009 for transmission losses is appropriate and available at the time of decision making. The validation team also confirmed from the actual credit notes 14/03/2012 (February 2012 month) received by the PP indicates State Electricity Utility (MSEDCL) is charging transmission line loss of 4.85% and hence the transmission loss of 4.85% considered by the PP is appropriate. Noted the recent actual credit notes dated 17/09/2012 indicates the transmission loss is changed to 4.24% by MSEDCL (with effect from 05/09/2012) and the validation team confirmed that it is not going to impact, as the IRR does not cross the benchmark. In the initial financial calculation sheet, the calculation of wheeling and transmission losses from 2nd year onwards was not linked with 'assumptions' sheet (IRR analysis) hence CL03 was raised. PP has revised the sheet with linkages. Hence, CL03 was closed.	OK ~~CL03 was closed.~~
Transmission Charges	INR/MW/Day	918.25	MERC order dated	The transmission charges have been verified from the MERC website[8] wherein an explanatory note on applicability of wheeling and transmission charges have been included. The note	OK

[8] http://www.mercindia.org.in/pdf/Order%2058%2042/Open_Access_Wheeling_Charges_2010_11.pdf

			17/08/2009	clearly provides the reference to the Transmission charges for short-term open access transactions shall be INR 918.25 per MW per day.	
Depreciation rate as per Income Tax	%	80	IT Act	The value has been referred from Section 32 of Income Tax Act 1961 of the host country. Validation team confirmed that the rate of depreciation is in accordance with the host country regulations and confirmed it from the referred Section of Income Tax Act 1961. In the financial spreadsheet, 80IA benefits were not considered in the 9th year despite of positive taxable income, hence a CAR03 was raised. PP has revised the financial spreadsheet and the team has confirmed the calculations are appropriate and valid. CAR03 was closed.	OK ~~CAR03 was closed~~
Depreciation rate as per Companies Act	%	5.28	Companies Act	Validation team confirmed that the rate of depreciation as per the Companies Act 1956 has been applied for computation of Profit Before Tax. Validation team confirmed that depreciation, being a non-cash item has been added back to the Profit after Tax for calculating IRR, which is in accordance with guidance 5 of 'Guidelines on the Assessment of Investment Analysis'.	OK
Corporate tax	%	33.22	IT Act	In accordance with the local taxation laws. Tax rate is calculated as base rate with 10% surcharge and 3% education cess. Base rate for the corporate tax is 30%. Section 80 IA tax exemption is available to the PP within years 1-15 only when the cumulative profit (refer Row 52 of worksheet named 'IRR') is positive for a consecutive period of at most 10 years. In this case, this tax exemption could not be availed in years 1-8 due to this reason. In Year 9, as soon as cumulative profit from the project activity becomes positive, tax exemption has been applied till Year 15. The decision to invest was taken on 06/04/2010 and project was expected to commence the generation in Financial Year (FY) 10-11, the applicable year for tax rate would be FY 10-11 (AY 11-12). The rate for AY 11-12 is 33.22, which should be correct tax rate applicable. PP has charged tax at 33.99% the rate applicable for FY 09-10. Hence, a CAR05 was raised. PP has revised the IRR sheet considering the corporate tax for the year 2010-11. Hence, CAR05 was closed.	OK ~~CAR05 was closed~~
Tax holiday	years	10	IT Act	The PP also has factored in the provision of claiming tax holiday for consecutive 10 years within the first 15 years of the operation as per the income tax rule of the host country. Wind project activities in India enjoy the privilege of carrying the tax liabilities of the wind power project activities towards other businesses by the same investor. In this case, the PP has a negative tax liability in Years 1 & 2. For most investments, the PP would not have to pay corporate tax as its liability is negative in these years. However, for investments in wind power project, the PP has the liberty to carry over this negative liability of tax towards profits made by	OK ~~CAR05 was closed~~

				it in some other business. Further to this, the PP has applied accelerated depreciation benefit as per Indian Income Tax Act which leads to negative tax payable arising out of high and unabsorbed depreciation which may be used by the PP to offset the profits in other businesses. This act as a benefit or cash inflows to the PP which should be accounted for in the financial calculations of the project as it is a direct benefit which arises out of the project. Hence as per the accounting principles the PP has correctly considered the benefits/cash inflows due to accelerated depreciation and therefore as clearly defined in the PAT calculations for years 1 and year 2 the negative tax payable has a positive impact on the IRR thereby increasing it. Hence it is an appropriate and conservative assumption. The validation team confirms that the PP has correctly accounted for the accelerated depreciation benefits and the tax shield. This helps the PP in reducing is overall tax liability. Thus, referring to Cell 'D54' of the worksheet 'IRR', the PP has a tax liability of INR (-) 4601.67 Lakhs (1 Lakh = 0.1 million). If assume that the same PP has a tax liability of INR 5000 Lakhs (say) due to profits made in its other businesses, the overall tax liability of the PP is INR (5000 – 4601.67) = INR 398.33 Lakh. Thus, a negative tax liability is equivalent to revenues made in form of tax savings and hence, improves the profitability of the project activity. PP has not considered 80IA benefits in the 9th year despite of positive taxable income. Hence, a CAR05 was raised. PP has then considered and revised the IRR sheet. http://law.incometaxindia.gov.in/DitTaxmann/IncomeTaxActs/2005ITAct/section80ia.htm	
Equity	%	100	Assumption	The investment analysis & the PDD did mention that the project activity is completely funded by the equity by the project participants. A CAR02 was raised in this regard and the PP has submitted an undertaking letter dated 01/08/2011 stating that the CDM project activity "Wind power project at Jaibhim by SIIL" has been funded entirely through equity by Serum Institute of India Limited. During the site visit, the team has interviewed the senior management and site personnel, and confirmed that the project activity is funded through equity only.	OK ~~CAR02 was closed~~
Residual Value of plant and machinery	(% of plant and machinery cost)	10	Assumed	The residual value assumed by PP is confirmed to be appropriate and in line with standard accounting practices followed within the host country. The residual value is added back in the terminal year. The PP did not consider the residual value of the plant and machinery in the IRR analysis, CL03 was raised. PP has now considered the residual value in the IRR calculations, CL03 was closed.	OK ~~CL03 was closed~~
Land cost	INR million/WTG	3.2	Supplier quotation	Land cost was sourced from the supplier quotation dated 12/03/2010, Annex I, Section VIII. The land cost is added back in the terminal year as salvage value. PP has reported residual value under other income and calculated tax including the same	OK ~~CL03 was closed~~

				under income head, CL03 was raised. PP has now corrected the tax calculation. The Cost of land is assumed to be a non-appreciable and non-depreciable asset for the financial calculations, CL03 was closed. The validation team has also verified the purchase order for acquiring freehold rights of land and free access dated 05/08/2010 for 6 WTGs and 12 WTGs confirmed that the land cost of INR 3.2million per WTG.	
CER Price	€/tCO_2e	12	Assumed	The PP assumption is found to be appropriate and hence accepted	OK
Exchange Rate for Euros	INR/€	61.47	As on 21/03/2010 @ www.oanda.com	The rate applied is as available on 21/03/2010 which is prior to the date of decision making and hence accepted	OK

PP had initially decided for installing 18 WTGs. However, later due to site constraints, PP installed 16 WTGs. As the PP had decided to invest in 18 WTGs at the time of investment decision making, the financial analysis has been presented considering 18 WTGs. However, as the project cost is based on cost per WTG, the IRR considering 16 WTGs will be the same as for 18 WTGs(Separate IRR sheet for 16WTGs is provided). Validation team confirms that the O&M cost is on the basis of per WTG and hence will have the same effect with increase/decrease in the number of WTGs. Similarly net generation estimate is WTG based and hence shall have the same effect for increase/decrease in number of WTGs. Also, energy savings rate, wheeling losses/charges, transmission losses/charges shall not be affected as these are based on kWh of electricity.
The Validation team confirmed that the IRR for both the scenarios (18WTG or 16 WTGs) is the same and appropriate. However, as the project activity has implemented 16 WTGs, the emission reduction estimate is calculated to represent the actual scenario of 16 WTGs so as to have a realistic emission reduction estimate, which is appropriate.

	Validated situation	**Conclusion**
4. Confirm the suitability of any benchmark applied in the investment analysis: (a) Determine whether the type of benchmark applied is suitable for the type of financial indicator presented. (b) Ensure that any risk premiums applied in determining the benchmark reflect the risks associated with the project type or activity. (c) Determine whether it is reasonable to assume that no investment would be made at a rate of return lower than the	Project participant had demonstrated that the financial returns of the proposed CDM project activity would be sufficient to justify the required investment (conformity to paragraph 109(C) of VVM). For demonstrating the financial unattractiveness of the project activity, PP had chosen investment barrier and to demonstrate the investment barrier, benchmark analysis was selected. The PP has chosen equity IRR to demonstrate the additionality of the project. Considering the facts that the project is funded by equity only, equity IRR is used by the project developers to evaluate the investment worthiness of the project and guidance 12 of Annex 5, EB62 allows the use of equity IRR to demonstrate the additionality as well. Expected returns on equity are used as a benchmark for the equity IRR using CAPM model, which is as per the guidance 12 of Annex 5, EB62. Expected rate of return on equity' (Ri) based on the Capital Asset Pricing Model (CAPM) method	OK ~~CAR04 was closed~~

	Validated situation	Conclusion
benchmark by, for example, assessing previous investment decisions by the project participants involved and determining whether the same benchmark has been applied or if there are verifiable circumstances that have led to a change in the benchmark.	is calculated with the help of the following formula: Ri = Rf +β×(Rm-Rf) Where, Ri - Expected rate of return on equity Rf - Risk free rate of return Rm - Market rate of return β - Beta (Rm-Rf) - Market risk premium **Risk free rate of return (Rf):** The risk free rate is the return that is assured on capital investment. Essentially, these are the financial instruments for investment without any default risk. In case of India, the Government of India bonds or securities are considered as the most suitable representative for calculation of risk free rate in the market. The Reserve Bank of India's Yield to Maturity rate has been adopted as the risk-free rate of return which stood at 8.2672% at the time of decision making. The returns on Central Government securities as verified from the official website of the Reserve Bank of India which is at 8.2672% for 10/03/2010. Considering a long term period of 20 years which is appropriate as the financial analysis is performed for a 20 year operation period. The team has confirmed that the risk free rate of return was the recent data as available at the time of investment decision (06/04/2010). Source (link) of risk free rate of return adopted by project participant was not provided in the calculation. Hence, a CAR04 was raised. The PP has considered the Reserve Bank of India's Yield to Maturity rate has been adopted as the risk-free rate of return which stood at 8.2672% (on 10/03/2010- latest available data before the time of decision making) http://www.rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=11067). Hence, CAR04 was closed. **Expected Market rate of return (Rm):** The expected market rate of return has been based on the publicly available BSE-500 Index data. In the initial Version of investment analysis sheet and PDD does not address the following ; • PP has not justified the use of risk premiums of Reliance infrastructure group who is operating multi sectors with infrastructure (roads, metro, airport, real estate) and energy (generation, transmission, distribution and trading), EPC (Engineering, Procurement and Construction) activities, as it would not reflect the true risks associated with the power	

	Validated situation	Conclusion
	sector. • PP has not justified the why unlevered beta was not used in the calculation, to remove the leverage of finance structure and tax structure of companies • PP has not provided any justification for the selection of BSE 500 index over other indices like BSE 200 and BSE Sensex. Hence, a CAR 04 was raised. PP has now addressed all the points raised in CAR04 and it was closed. Refer the findings log at end of the report for details. For the calculation of the market risk premium, it is common to use a widely diversified stock market index as a proxy for the market portfolio. In India, number of stock market indices – BSE 30, BSE 100, BSE 500, S&P CNX 500, Nifty, etc. – are available. Often the choice is between a widely diversified portfolio and one that is only made up of the largest or most frequently traded companies, i.e., between 'breadth' and 'depth'. While BSE-500 Index represents 93.53% of market capitalization, BSE Sensex account for only 42.19% market capitalization. This information can be accessed at http://www.bseindia.com/mktlive/indiceshighlights.asp. Other indices represent market capitalization between these two extremes. Hence, though BSE Sensex is the oldest index and gives data for the past 20 years, it lacks breadth, which is one of the pre requisites and principles on which CAPM rests. BSE-500 Index is a broad-based Index constituting 500 companies across 20 sectors listed at the exchange, representing approximately 93% of the total market capitalization on BSE and covers all 20 major industries of the economy. The BSE - 500 Index is scientifically calculated and the 500 companies (including 15 power sector companies) are selected based on market capitalization, liquidity and balanced industry representation. Thus, this is the largest quantum of data (500 companies) available among all the other indices and provides the most comprehensive view of the Indian capital market. Therefore, validation team has confirmed that BSE-500 is deemed to be the most appropriate market index. The BSE-500 index started in February 1999. This index has vintage data available since February 1999 (inception date). PP has considered the BSE-500 index data from February 1999 (period of inception) to 31/03/2010 (prior to investment decision date), which amounts to 11.16 years. As per "Equity Risk Premiums (ERP): Determinants, Estimation and Implications", by Aswath Damodaran (http://pages.stern.nyu.edu/~adamodar/pdfiles/papers/ERPfull.pdf), the use of vintage data for 10 years and above is considered an acceptable practice.	

	Validated situation	Conclusion
	The average market return has been calculated with the help of the Compound Annual Growth Rate (CAGR). The CAGR is a metric that measures the average returns from the stock market investments over a period of time. It is a more accurate measure than simple average of returns and calculated as: CAGR = (index value at end/ index value at beginning) ^ (1 / no. of years) – 1 LRQA verified the values considered for calculating the CAGR from publicly available information (http://www.bseindia.com/histdata/hindices.asp) and confirms the calculation for market rate of return from the data available during the investment decision as **18.90%**. **Beta** Beta is the measure of the risk of a specific sector/company. Beta for similar power sector companies can be applied as proxy risk profile for the project activity for determination of expected/required return on equity. The Beta in the CAPM equation helps account for the systematic risk by quantifying the sensitivity of the stock of a listed company representing a particular project type/sector with the market returns. Nicolaas Groenewold and Patricia Fraser state, "*CAPM betas are widely used in practice. In general, they are used for some future period, e.g. for calculating required returns or expected future returns or for cost of capital computations as an input into project evaluation. However, since future betas are not known, it is common practice to use betas estimated over some recent period. Underpinning this application of the CAPM betas is the assumption that the betas estimated over a recent period are appropriate as an input into calculations that require projections into the future. While this procedure would be acceptable if the betas were known to be stable over time, there is widespread evidence to the contrary – rather than being constant, the betas are time-varying. This is reflected in the very fact that in practice the betas are generally estimated over relatively short periods, five years being common*". They also state, "*We experimented with alternative estimation periods as a basis for the rule of thumb forecasts and found that, contrary to common practice, a three-year rule is optimal*". Please see Groenewold, N. and P. Fraser (2000), "Forecasting Beta: How Well Does the 'Five Year Rule of Thumb' Do?", Journal of Business Finance & Accounting, Vol. 27, No. 7-8, pp. 953-982(30). Validation team confirmed a 5 year period for beta calculation is appropriate based on financial expertise. Furthermore, the article "Estimating Risk Parameters, Aswath Damodaran Stern	

	Validated situation	Conclusion
	School of Business". by Aswath Damodaran states the following: *"Risk and return models are silent on how long a time period one needs to use to estimate betas. Services use periods ranging from two years to five years for beta estimates, with varying results".* Also, the article "Investment Management A modern guide to security analysis and stock selection" mentions "…an analyst has the liberty to choose the time period for beta estimation. Typically analysts use 2 year and 5 year data. The latter is more popular…" SIIL has calculated the beta for the period of 3 years which is appropriate and in line with host country accounting practices. PP has chosen all the power generating companies of BSE500 at the time of decision making and computed the average data using monthly stock prices over a period of 3 years upto the month prior to decision making i.e 31/03/2010. Out of 15 power sector companies of BSE 500, 11 nos. are in the power generation sector (2nos. are having significant investments in hydro sector), remaining 4nos are in power transmission, and hence the exclusion of 6nos. companies in the benchmark analysis is justified, because of the diverse risk profile. PP has appropriately chosen nine companies for beta calculation.. The beta values calculated based on the above method is the equity beta as it was derived based on the market returns of the similar power generating companies which has already incorporated the impact of the financial risk on the share. The levered beta has been referred which is acceptable for calculation of CAPM based return. Also, validation team checked similar CAPM based benchmarks of similar registered CDM project activities (reference no. 3327, 3632, 4572, 6031, 6113 and 6390) which refer to levered beta and hence the approach is found to be reasonable. LRQA confirms the Beta calculation is in line with the Guidelines on the Assessment of Investment Analysis Version 05 which stipulates that risk premiums applied in the determination of required returns on equity shall reflect the risk profile of the project activity being assessed. The Beta value has been taken to be the average of the 3 year beta values of the following nine companies involved in power generation which are listed on the BSE -500 index. The project activity involves the installation of a new wind energy based power plant in Maharashtra of 33.6 MW capacity. The project is funded entirely through equity and there is no debt involved. Hence, the project participant has chosen the equity IRR as the financial indicator	

	Validated situation	Conclusion
	for the demonstration of additionality of the project. This indicator incorporates the business as well as the financing risks of the project. Unlevering this beta will remove financing risks and hence cannot be considered to be comparable to the chosen financial indicator. Thus, levered beta is used for the benchmark calculation since it incorporates business as well as financing risk and is thus appropriate for comparison with the equity IRR for the project activity. Returns have been calculated based on the growth the BSE-500 index has witnessed since its inception till decision making date. This time difference, in years, between these two dates, has been computed as 11.16 years for use in the standard CAGR formula for estimating market returns. The project activity is being funded through equity alone, the choice of equity IRR as the financial indicator for demonstration of additionality, with equity beta (levered beta) for the benchmark calculation is therefore justified and acceptable to the validation team. The average market return has been calculated with the help of the Compound Annual Growth Rate (CAGR). The CAGR is a metric that measures the average returns from the stock market investments over a period of time. It is a more accurate measure than simple average of returns and calculated as: CAGR = (index value at end/ index value at beginning) ^ (1 / no. of years) – 1 LRQA verified the values considered for calculating the CAGR from publicly available information and confirms the computation for market rate of return as 18.90% for the 11.16 years period ranging from year 01/02/1999 (base year) and 31/03/2010 before the date of decision making i.e. 06/04/2010. The Beta value has been taken to be the average of the 3 year beta values[9] of the following companies which are listed on the BSE -500: 1. CESC Ltd. 2. Gujarat Industries Power Co.Ltd. 3. KSK Energy Ventures Ltd.	

[9] Average of three year beta values is found to be conservative as compared to average based on four year beta values.

	Validated situation	Conclusion
	4. Neyveli Lignite Corpn. 5. BF Utilities 6. Reliance Infrastructure Ltd. 7. Tata Power Co. Ltd. 8. Torrent Power Ltd. 9. NTPC The average beta for all of the above mentioned companies that has been used for the benchmark calculation was 1.0801 for the same period. Since there are nine different power generating companies involved in the calculation of the Beta, the average value of 1.0801 is deemed appropriate and conservative. The risk premium value has been arrived at by calculating the Compound Annual Growth Rate for the BSE-500 since its base year (1999) on a base value of 1,000. At the time of decision making, BSE-500 had a low of 6,906.52. Hence, the risk premium value is Rm = {(6,906.52/1,000) ^ (1/11.16) – 1} = 18.90% Wherein, 11.16 is the number of years between the base date and the period of decision making. Hence, Ri = 8.2672 + 1.0801 * (18.90 – 8.2672) = 19.75% Thus, the benchmark value of 19.75% calculated for the project activity as considered by the PP at the time of investment decision making is reasonable and acceptable. In addition, PP had provided additional benchmark scenario considering BSE-Sensex wherein the data vintage for calculating the market returns is similar/larger as compared to the project activities operational lifetime of 20 years. The market returns for BSE-Sensex is available for a period of 31 years. Validation team confirmed the benchmark calculation for both the index as below: **BSE Sensex:** The market returns were calculated based on a period of 31 years (BSE Sensex data (BSE 30) index is available since April 1979. The end date is considered as 31/03/2010, prior to the investment decision). Thus, a wide range of values is available with SENSEX since its inception (i.e. a period of more than 30 years). This eliminates any short term volatility observed in the market and hence considered appropriate. The beta was calculated based on a 3 year period which is considered appropriate as detailed above. The benchmark value referring	

	Validated situation	Conclusion
	BSE Sensex is calculated as 20.08% as below. • Risk Free Rate of Return (Rf) 8.2672% (for 20 year maturity period as validated above) • Beta (Average) 1.2091 • Market Returns (Rm) 18.04% Hence, Benchmark (CAPM) = **20.08%** (calculated as per formula for CAPM in above section) Therefore, the validation team confirms the benchmark of **19.75%** chosen by PP at the time of investment decision making to be appropriate and reasonable. Moreover, the chosen benchmark is conservative on comparing with the benchmark based on the BSE-Sensex having a longer time period for calculating the market returns. The validation team has further cross checked the benchmark using para 15 of Guidelines on the assessment of the investment analysis (Version 05, EB 62) and calculating the value for cost of equity from " Appendix of Default values for the expected return on equity" of EB62,Annex 5,Page 7- the value computed is 17.34% as mentioned below: The relationship between real rate and nominal rate is (Fisher formula)[10]: Rn = (1 + Rr)(1 + Ri) - 1 = Rr+ Ri+ RrRi Where, Rn is nominal rate, Rr is real rate and Ri is inflation rate. Rr = The real rate taken from " Appendix of Default values for the expected return on equity" of EB62,Annex 5,Page 7 (Group I) for the host country = 11.75% Ri = 5% =The inflation rate considered from the Reserve Bank of India results of quarterly survey of professional forecasters on major macroeconomic indicators for the year 2010-11(Quarter 2), page 5. Rn= (1+11.75%) x (1+5.0%)-1=17.34% Validation team confirmed that the IRR does not cross the benchmark calculated based on Appendix Default values i.e. 17.34% even after applying sensitivity variations.	

[10] Formula is referred from the weblink (http://tfsfrd.tamu.edu/tdss/Basic/rateCalc.asp)

	Validated situation	Conclusion
5. If the project participants rely on values from a Feasibility Study Report (FSR) approved by any national authority, the team is required to ensure that: (a) The FSR has been the basis of the decision to proceed with the investment in the project, that is, that the period of time between the finalization of the FSR and the investment decision is sufficiently short for the DOE to confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed. (b) The values used in the PDD and associated annexes are fully consistent with the FSR and, where inconsistencies occur, the DOE should validate the appropriateness of the values. (c) On the basis of its specific local and sectoral expertise, confirmation is provided, by cross-checking or other appropriate manner, that the input values from the FSR are valid and applicable at the time of the investment decision. Use the table below to cross-check input values and describe here the results of the comparison.	Not applicable, as the PP has used the values from the supplier quotation.	NA

Comparison to similar registered project in the region:

CDM Ref	Investment cost	Tariff	O&M cost	Capacity	Output	Investment cost per output	Load factor	O&M relative to investment	O&M per output
NA									
NA									

NA									
NA									

	Validated situation	Conclusion
SECTION 6d. Barrier analysis		
1. Does the PDD demonstrate that the proposed project activity faces barriers that prevent its implementation and do not prevent at least the implementation of one of the alternatives? Provide here an overall determination of the credibility of the barrier analysis. Use the below table to list each barrier considered in the PDD and to describe how the team undertake their validation.	**Not applicable**	-

Barriers are issues in project implementation that could prevent a potential investor from pursuing the implementation of the proposed project activity. The identified barriers are only sufficient grounds for demonstration of additionality if they would prevent potential project proponents from carrying out the proposed project activity undertaken without being registered as a CDM project activity.

Type of Barrier	Description in the PDD	Determination			Conclusion
		Barriers are real	Prevent implementation of PA	Do not prevent implementation of BL	
Access to finance					NA
Risks related barriers					NA
Technological					NA
Due to prevailing practice					NA

Other					NA
First of its kind					NA

	Validated situation	Conclusion
SECTION 6e. Common practice analysis		
1. Describe how the geographical scope of the common practice analysis has been validated. Assess whether the geographical scope (for example, the defined region) of the common practice analysis is appropriate for the assessment of common practice related to the project activity's technology or industry type.	Though as per paragraph 5 of the "Tool for the demonstration and assessment of additionality Version 06.0 " requires the host country is to be considered as the default geographical area, PP has considered the host country as a geographical area/region A CAR09 was raised as the PPhas not considered the entire host country as the applicable geographical area, now PP has presented the analysis in revised PDD.	OK ~~CAR09 was closed~~
2. Determine to what extent similar and operational projects (for example, using similar technology or practice), other than CDM project activities, have been undertaken in the defined region.	The PP has considered *"Measure"* as *(b) Switch of technology with or without change of energy source (including energy efficiency improvement as well as use of renewable energies);*" and is in line with the paragraph 6 of the tool. PP has considered large scale wind power project activities (18.9 MW – 56.7 MW) commissioned in the host country post-2003 for the common practice analysis, validation team confirmed that they are inline with the para 47 (applicable output range as ±50% of the design output capacity of 37.8MW of the project activity). *Different technologies in the context of the project activity*: a) Energy source/fuel: In this case, the source of energy is wind power b) Feed Stock: This criterion is irrelevant in the context of the project activity as no feed stock is involved c) Size of installation: Since the installed capacity of the project activity is higher than 15 MW, the installation size shall be considered as "*Large*" d) Investment climate: i. Access to technology: Access to the wind power generation technology is fairly same across the host country ii. Subsidies or other financial cash flows: Though not applicable in the case of wind power, subsidies are regulated by the Ministry of New & Renewable Energy, India for the entire host country iii. Promotional policies: Though not applicable in the case of wind	OK ~~CAR09 was closed~~

	Validated situation	Conclusion
	power, subsidies are regulated by the Ministry of New & Renewable Energy, India for the entire host country iv. Legal regulation: As per the Electricity Act 2003, the state electricity regulatory commissions are responsible for formulating legislations for various renewable energy power projects coming up in the respective state. In light of this, it may be appropriate to consider the pre-2003 era of the Indian power sector as a different investment climate altogether. Since such regulations vary from state-to-state, the same renewable energy power project will be subjected to different regulations depending upon its location. Hence, in this case, project activities with similar legal regulation are those commissioned post-2003 in the state of Maharashtra. e) Other features: No additional aspects of variance are observed for similar project activities *Applicable geographical area*: As per paragraph 5, the host country is to be considered as the default geographical area. Thus, as per paragraph 47 of the methodological tool, *Step 1: Calculate applicable output range as +/-50% of the design output or capacity of the proposed project activity* The applicable output range is 18.9 MW to 56.7 MW (i.e. +/- 50% of 37.8MW). *Step 2: In the applicable geographical area, identify all plants that deliver the same output or capacity, within the applicable output range calculated in Step 1, as the proposed project activity and have started commercial operation before the start date of the project. Note their number N_{all}. Registered CDM project activities shall not be included in this step.* In this step, all the plants in India delivering power in the applicable output range of 18.9 MW to 37.8 MW have been considered. Further, all the CDM registered project activities and project activities undergoing validation have been excluded, evidence has been provided in a separate sheet. In this step, all the plants in India delivering power in the applicable output range of 18.9 MW to 37.8 MW have been considered. Further, all the CDM registered project activities and project activities undergoing validation have been excluded	

	Validated situation	Conclusion

Technologies	Total number of projects in the capacity range	N_{all}
Hydroelectric	44	44
Thermal	8	8
Nuclear	0	0
Wind	54	18
Biomass & Bagasse	84	71
Total ($\mathbf{N_{all}}$)		141

Step 3: *Within plants identified in Step 2, identify those that apply technologies different that the technology applied in the proposed project activity. Note their number N_{diff}.*

In this step, those project activities that apply technologies different from that of the project activity (as defined above "*Different technologies"*) have been identified

Technologies	N_{diff}
Hydroelectric	44
Thermal	8
Nuclear	0
Wind	17
Biomass & Bagasse	71
Total ($\mathbf{N_{diff}}$)	140

Step 4: Calculate factor F=1-Ndiff/Nall representing the share of plants using technology similar to the technology used in the proposed project activity in all plants that deliver the same output or capacity as the proposed project activity

In this step, the factor F is evaluated as below:

	Validated situation	Conclusion
	$F = 1 – (N_{diff}/N_{all})$ $= 1- (140/141)$ $= 0.0071$ Also, $N_{all} – N_{diff} = 141-140$ $= 1$ Thus, the results of the analysis are as follows: a) $F < 0.2$ b) $N_{all} – N_{diff} =1$ Since both the conditions of paragraph 47 of the approved methodological tool are not fulfilled, the present project activity is *not* a "common practice" within a sector in the applicable geographical area. The validation team has reviewed the available information of CEA database for the entire host country of the projects with different technologies identified in the above steps and confirmed that the steps adopted are in line with the tool. The validation team has confirmed based on the above analysis that similar activity is not widely observed and the project activity is not considered as a common practice. The common practice analysis sheet has been submitted as evidence.	
3. If similar and operational projects, other than CDM project activities, are already widely observed and commonly carried out in the defined region, assess whether there are essential distinctions between the proposed CDM project activity and the other similar activities.	As above	OK

	Validated situation	Conclusion

SECTION 7. Monitoring plan

1. *Compliance of the monitoring plan with the approved methodology.* Confirm that the MP contains all the necessary parameters and that they are monitored in accordance to the approve Methodology using the following table:

Parameter	Monitoring Methodology description	PDD description	Validated situation	Conclusion
$EG_{facility,y}$	**Data unit**: MWh **Description**: Quantity of net electricity generation supplied by the project plant/unit to the grid in year y **Source of data:** Project activity site **Measurement procedures (if any):** Electricity meters **Monitoring frequency:** Continuous measurement and at least monthly recording **QA/QC procedures**: Cross check measurement results with records for sold electricity **Any comment**:-	**Data unit**: MWh **Description:** Quantity of net electricity supplied to the grid by the project plant/unit to the grid in year *y* **Source of data to be used:** Credit notes for generation by MSEDCL **Value of data : 55,759** **Monitoring frequency:** Values are monitored through main and check meters having an accuracy class of 0.2 and located MSEDCL sub-station. Continuous monitoring, hourly measurement and at least monthly recording **QA/QC procedures:** Meter calibration shall be conducted annually by MSEDCL's testing division. Generation values will be cross-checked with energy bill(s) at consumption	Data unit and description are described correctly. Validation team confirms the description of the parameter is in accordance with the methodology i.e. Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y The unit is correctly mentioned as MWh and the value of data is 55,759 MWh (at a PLF of 18.94%). The credit note provided by the state utility shall be used as source for $EG_{facility,y}$. This was confirmed during site visit interviews with the PP and the O&M staff Measurement methods: The net electricity supplied from the project WTGs is evacuated at 33kV through common feeder lines to a substation (33 kV/220 kV) wherein the electricity is stepped up to 220 kV. The WTGs are connected through a 33 KV overhead line up to Sakri Switchyard. Export and Imports to the feeder at MSEDCL substation will be measured through main and check meters of electronic tri vector type of 0.2 class. The total export at the main and check meter is arrived at by multiplying the monthly meter reading to the multiplying factor of the meter concerned. The monthly meter reading is arrived at as the difference between the current meter reading and the previous meter reading The formula has now been included in the revised PDD	OK

		centre by MSEDCL.	which will be applied on each WTG of a particular feeder is as follows: *Net export of electricity from WTG to Grid* = (% generation of individual WTG connected to feeder) X(Net electricity export @ MSEDCL meter for the feeder) where, % generation of individual WTG connected to feeder = (Controller reading @ Individual WTG)/(Sum of Controller reading of all WTGs connected on feeder) Additionally, MSEDCL receives daily export & import figures for each WTG from the O&M service provider with the help of which it calculates the electricity export by each WTG at the WTG controller. The electricity export reports are generated by MSEDCL on credit notes and sent to SIIL through the O&M service provider on a monthly basis. A sample of credit notes of MSEDCL has been reviewed and provided as a evidence. The monitoring arrangement for the $EG_{facility,y}$ was confirmed during site visit interviews with the PP and the O&M staff.	

2. *Implementation of the plan:* confirm that the monitoring arrangements described in the monitoring plan are feasible within the project design. Described the steps undertaken to assess this.	The monitoring plan describes the objective, organizational structure, roles and responsibility, the monitoring instruments, data monitoring procedure and the management system. A CAR07 was raised, as the web hosted PDD did not address the following; • The PP had not mentioned the operational and management structure to monitor the emission reductions and leakage effects in the PDD. • Description of responsibilities and institutional arrangements for the data collection and archiving was not specified in the PDD Revised PDD incorporating the above points was submitted by the PP, hence CAR07 was closed. Site review was conducted and confirmed that the monitoring is planned in a reasonable manner and considered feasible to be implemented by the PP.	OK ~~CAR07 was closed~~
3. *Implementation of the Plan:* confirm that the means of implementation of the MP, including the data management and quality assurance and quality control procedures, are sufficient to ensure that the emission reductions achieved by / resulting from the proposed CDM project activity can be reported ex post and verified	The monitoring plan includes the internal quality control and assurance process, data control system and regular calibration of the monitoring instruments as appropriate that will ensure reliable monitoring and reporting of the ERs.	OK

	Validated situation	Conclusion
SECTION 8. Local stakeholder consultation		
1. Determine whether comments by local stakeholders that can reasonably be considered relevant for the proposed CDM project activity, have been invited.	The PP has not provided any details on how the stakeholders were notified for the meeting, manner in which the stakeholders were apprised about the project activity, hence a CAR08 was raised. PDD has now been incorporated the manner in which the PP briefed the stakeholders and apprised them about the project activity. Hence CAR08 was closed. The PP had invited the notified the stakeholders through a public notice dated 11/10/2010 and individual invitation letters. This was confirmed by the validation team through the review of invitation letters sent by PP dated 15/10/2010. It was confirmed by the PP that the meeting was conducted on 26/10/2010 in the local language (Marathi) so as to allow the stakeholders understand the project activity details and socio-economic benefits. The stakeholders were encouraged to give their opinion about the project activity. No adverse comments were received through stakeholders' consultation process. This was also confirmed by the validation team during the site visit.	OK ~~CAR08 was closed~~
2. Confirm that the summary of the comments received as provided in the PDD is complete.	The validation team confirmed that the summary of comments received as provided in the PDD is complete. This was confirmed by the validation team through the review of minutes of stakeholder's meeting dated 26/10/2010.	OK
3. Confirm that the project participants have taken due account of any comments received and have described this process in the PDD.	No adverse comment was received during the local stakeholder consultation process that requires further action by the PP. This was confirmed by the validation team through the review of minutes of stakeholder's meeting dated 26/10/2010. This was also confirmed during the site visit.	OK

	Validated situation	Conclusion
SECTION 9. Environmental Impacts		
1. Is an EIA required by the environmental legislation of the host country? Describe the legislation applicable.	PDD mentions that wind projects will not fall under the purview of the Prior Environmental Clearance of Ministry of Environment & Forests, hence no EIA study is required. The validation team has reviewed the applicable EIA notifications and regulations of the host country and confirmed that wind power projects would not fall under the purview of the EIA as per the notification dated 14/09/2006 (http://www.moef.nic.in/legis/eia/so1533.pdf) and notification dated 01/12/2009 (http://moef.nic.in/downloads/rules-and-regulations/3067.pdf.). The validation team has confirmed that no EIA study or clearance is required for setting up wind power projects. The PP has obtained the requisite MEDA infrastructure clearance and commissioning clearance for setting up of WTGs.	OK
2. Confirm whether the project participants have undertaken an analysis of environmental impacts and, if required by the host Party, an environmental impact assessment.	As above	OK
3. Confirm that environmental impacts considered significant by the PPs or the Host country are described in the PDD, including mitigation measures.	The rules of host country do not require EIA for the type of the project activity.	OK

Findings[11]

1. Grade / Ref:	CAR 01	2. Date:	07/07/2011	3. Status:	Closed
4. Requirement:		Para 44 of VVM Version 01.2			
5. Nature of the Issue Raised:					
LoA by the DNA of the host country for the project has not been made available for validation.					
6. Nature of responses provided by the project participants:					
The LoA by the DNA of the host country for the project was made available.					
7. Assessment of such responses:					
PP has provided the LoA dated 10/04/2012.					
8. References to resulting changes in the PDD or supporting annexes:					
NA					

1. Grade / Ref:	CAR 02	2. Date:	07/07/2011	3. Status:	Closed
4. Requirement:		Para 58 of VVM Version 01.2 Guidelines for completing Project Design Documents– CDM-PDD Version 7.0			
5. Nature of the Issue Raised:					
It is indicated in the PDD section A.4.5 that "There is no public funding involved in the project activity", however no evidence to support the same is available for validation.					
6. Nature of responses provided by the project participants:					

[11] Explanation of the Findings Log structure:
1. Grading and Sequential Number of the finding
2. Date of Original Finding
3. New, Open, Closed
4. Requirement (VVM, PDD-CDM, etc)
5. Reference to Protocol
6. Details of PP's response
7. Evaluation from the Validation team
8. List of changes made as a result of the finding

An undertaking is submitted by the PP to the DOE to certify that no public funding is involved in the project activity.
7. Assessment of such responses:
PP has now submitted a declaration dated 01/08/2011 indicating that the project activity does not involve any public funding or ODA. Project activity is funded entirely through equity only**.**
8. References to resulting changes in the PDD or supporting annexes:
Section A.4.4 of PDD

1. Grade / Ref:	CAR 03	**2. Date:**	07/07/2011	**3. Status:**	Closed
4. Requirement:	Para 108,109,110 of the VVM Version 01.2 Guidance on the assessment of investment analysis Version 05				
5. Nature of the Issue Raised:					
1. PP has considered an exchange rate for INR ~ Euro dated 16/07/2010 (@ oanda.com, while the board decision is dated 23/03/2010. 2. In the financial spreadsheet, 80IA benefits are not considered in the 9th year despite of positive taxable income. 3. The decision to invest was taken on 23/03/2010 and project was expected to commence the generation in Financial Year (FY) 10-11, the applicable year for tax rate would be FY 10-11 (AY 11-12). The rate for AY 11-12 is 33.22, which should be correct tax rate applicable. PP has charged tax at 33.99% the rate applicable for FY 09-10. 4. PP to clarify about the exact date of investment decision as the evidence submitted indicated two dates 06/04/2010 and 23/03/2010					
6. Nature of responses provided by the project participants:					
1. The exchange rate has now been taken on the date 21/03/2010. 2. The error has been corrected in the revised financial spreadsheet. 3. The tax rate for the FY 10-11 (AY 11-12) is now used in the revised financial spreadsheet 4. The decision making date is considered to be 06/04/2010 and accordingly PDD/IRR sheet revised.					
7. Assessment of such responses:					
1. The exchange rate has been taken on 21/03/2010 which is valid at the time of decision making. 2. The financial sheet has been corrected accordingly 3. The corporate tax has been corrected as 33.22% for the financial year 2010-11 which is appropriate. 4. The validation team confirmed from the review of the minutes of the meeting of the wind mill committee that one out of the Board members, who has been authorised as per the Board decision dated 23/03/2010, has taken a decision about the project and hence the revised date is accepted. The changes have been made in the benchmark sheet as per the revised investment decision date and hence the finding is closed.					
8. References to resulting changes in the PDD or supporting annexes:					
Section B.5 of PDD, IRR sheet					

1. Grade / Ref:	CAR 04	2. Date:	07/07/2011	3. Status:	Closed
4. Requirement:		Para 108,109,110 of the VVM Version 01.2 Guidance on the assessment of investment analysis Version 05			

5. Nature of the Issue Raised:

1. PP to justify use of the risk premiums of the following companies in determining benchmark, as they would not reflect true risks associated with the power sector (electricity generation):
   Reliance Infrastructure is a group with multi sectors with Infrastructure (roads, metro, airport, real estate), Energy (Generation, transmission, distribution and trading), EPC activities
2. PP has considered 5 companies in the power sector, generating power through different means such as thermal / hydro / wind. However it is prudent that the beta values obtained from the aforesaid companies be unlevered to remove the leverage of finance structure and tax structure of these companies. This is not considered by PP. Please justify.
3. PP has used BSE 500 index from Feb.1999 to Feb.2010. PP to justify the selection of BSE-500 over other indices such as BSE Sensex and BSE-200.
4. Evidence submitted to the DoE for YTM was not showing clearly the values for the 20years period.
5. Source (link) of risk free rate of return adopted by project participant is not provided in the calculation.
6. B.5 of PDD does not mention the Depreciation rates, CER price, exchange rate for CER and tax rate however the same are considered in IRR analysis.

6. Nature of responses provided by the project participants:

1. The PP has chosen all power generating companies which were a part of the 'List of constituents' of BSE-500 at the time of decision-making and computed the average beta using the monthly stock prices over a period of 5 years up to the month prior to decision making (up to February 28, 2010). There are 15 companies in power sector of which only 11 are in power generation sector. The balance 4 companies are in power transmission sector and have been excluded as their risk portfolios are substantially different from power generating companies. Further, of the 11 power generating companies, Jaiprakash Hydro & NHPC had not been considered as they have more significant investments in the hydro sector.
2. The project activity being an equity project, the PP has chosen the equity IRR as the financial indicator for the demonstration of additionality. Hence, the equity beta (i.e. levered beta) is used for the benchmark calculation.
3. The BSE-500 Index is a Broad-Based Index and constitutes a large pool of companies across 20 sectors listed at the Exchange, representing approximately 93% of the total Market Capitalization. It is an index which covers all the major Power companies and is thus used for arriving at the Beta value. However, the PP has also evaluated the benchmark using the BSE-200 index, which is noted to be 19.73%, the evidence is attached. The benchmark using BSE 500 Sensex is noted to be 19.75%, which is presented in the PDD.
4. PP has now provided evidence for YTM for the risk free rate of return.
5. PP has now provided evidence for YTM for the risk free rate of return
6. PDD has been revised

7. Assessment of such responses:

1. PP's selection of 9 companies out of 15 companies of BSE 500 list is justified.
2. The use of equity beta for benchmark calculation can be justified, as the project is funded through 100% equity and PP used Equity IRR as a financial

indicator. This indicator incorporates the business as well as the financing risks of the project. Thus, considering levered beta for the benchmark calculation is deemed appropriate since it incorporates business as well as financing risk and is thus appropriate for comparison with the equity IRR for the project activity.

3. The PP has made the choice of using BSE 500 index for the IRR calculation at the time of decision making. The benchmark of 19.75% is obtained using BSE 500 index. The validation team has also cross checked with the benchmark of 19.73% is obtained using BSE 200 index. The equity IRR for the project activity without considering the CDM returns is 10.71% which is below the benchmarks using both indices. The DoE has cross checked the equity IRR using the estimate energy savings with escalation by 3.06% CAGR per annum, results in an IRR of 14.42%, but still below the benchmark. In addition, validation team has further cross checked the benchmark using para 15 of Guidelines on the assessment of the investment analysis (Version 05, EB 62) and calculating the value for cost of equity from " Appendix of Default values for the expected return on equity" of EB62,Annex 5,Page 7- the value computed is 17.34%. The IRR does not cross the benchmark even after applying sensitivity variations.
4. PP has now provided evidence for YTM for the risk free rate of return showing 20 years
5. PP has provided the evidence of risk free rate of return link in the IRR sheet
6. These have been updated in PDD Version 05

8. References to resulting changes in the PDD or supporting annexes:
Section B.5 of PDD, IRR sheet

1. Grade / Ref:	CAR 05	**2. Date:**	07/07/2011	**3. Status:**	Closed
4. Requirement:	Para 98 of VVM Version 1.2 Guidelines On the Demonstration And Assessment Of Prior Consideration Of the CDM (Version 04)				

5. Nature of the Issue Raised:
The timeline in section B.5 of the PDD does not include the date of notification to host country DNA.
6. Nature of responses provided by the project participants:
The date of notification to host country DNA is included in the revised PDD.
7. Assessment of such responses:
PP has now included the date of notification to the host country DNA in the revised PDD. Hence this was closed
8. References to resulting changes in the PDD or supporting annexes:
Section B.5 of PDD

1. Grade / Ref:	CAR 06	**2. Date:**	07/07/2011	**3. Status:**	Closed
4. Requirement:	Para 89 of VVM Version 1.2				

	Tool to calculate the emission factor for an electricity system Version 2.2.1, EB63

5. Nature of the Issue Raised:

1. Section B.6.1 of PDD refers to Version 2.1.0 of the *"Tool to calculate the emission factor for an electricity system*" however the latest version of the tool is Version 2.2.1
2. All steps used for calculation of baseline emission factor in section B.6.1 were not inline with the requirements by the Version 2.2.1 of the tool
3. Absolute emission data presented in Annex 3 was wrong with respect to 2008-09 year
4. Emission reduction equation as mentioned in the Section B.6.1 is not inline with the methodology.

6. Nature of responses provided by the project participants:

1. The version of the "*Tool to calculate the emission factor for an electricity system*" is updated in the revised PDD.
2. Section B.6.1 is now updated as per the latest version of the "*Tool to calculate the emission factor for an electricity system*".
3. The absolute emissions in Annex 3 are corrected in the revised PDD.
4. The emission reduction equation is corrected as per the methodology.

7. Assessment of such responses:

1. Section B.6.1 of PDD is now addressed in line with the latest tool Version 2.2.1. EB63.
2. All the steps mentioned in the PDD are line with latest tool
3. Absolute emission data in Annex 3 were now corrected
4. Emission Reduction equation was corrected

In the web hosted PDD, the PP has considered power generation of 58,140 MWh from 17nos. of WTGs (CER estimated to be 55,151 tCO2), however due to the actual implementation of 16nos. WTGs with a power generation of 55759 MWh and total CER estimated to be 52,898 tCO2.

8. References to resulting changes in the PDD or supporting annexes:

Section B.6.1, 6.3, Annex 3 of PDD and ER sheet

1. Grade / Ref:	CAR 07	**2. Date:**	07/07/2011	**3. Status:**	Closed
4. Requirement:		Para 122of VVM Version 1.2			

5. Nature of the Issue Raised:

<u>Related to Monitoring Plan</u>

1. The operational and management structure that the project operator will implement in order to monitor emission reductions and any leakage effects generated by the project activity is not described in section B.7.2 of the PDD.
2. Description on the responsibilities for and institutional arrangements for data collection and archiving is also not included in section B.7.2 of the PDD

6. Nature of responses provided by the project participants:

Section B.7.2 was now revised.

7. Assessment of such responses:
Operational and Management Structure for monitoring the project and responsibilities & institutional arrangements for data capturing and archiving is now addressed by the PP in revised PDD
8. References to resulting changes in the PDD or supporting annexes:
Section B.7.2 of PDD

1. Grade / Ref:	CAR 08	2. Date:	07/07/2011	3. Status:	Closed
4. Requirement:		Para 128 of VVM Version 1.2			
5. Nature of the Issue Raised:					
Section E.1 of the PDD provides details on how the local stakeholders were notified for the meeting; however the details on how the project participant described the project activity to the invited stakeholders in a manner to allow them understand the project activity is not included.					
6. Nature of responses provided by the project participants:					
Section E.1 of the PDD has been updated					
7. Assessment of such responses:					
The manner in which the PP briefed the stakeholders and apprised them about the project activity is included in the revised PDD. The local stakeholder consultation process and the manner in which PP described the project to the stakeholders has been confirmed by the validation team during the site visit and description given in revised PDD is found to be appropriate.					
8. References to resulting changes in the PDD or supporting annexes:					
Section E.1 of PDD					

1. Grade / Ref:	CAR 09	2. Date:	07/07/2011 (raised subsequent to the TR finding)	3. Status:	Closed
4. Requirement:		Para 128 of VVM Version 1.2			
5. Nature of the Issue Raised:					
Version 6 of "Tool for the demonstration and assessment of additionality" paragraph 6 mentions: **Applicable geographical area** covers the entire host country as a default; …. PP has not provided any justification that the applicable geographical area is smaller than the host country for technologies that vary considerably from location to location depending on local conditions. PP has also not justified in the PDD how considering Maharashtra state is appropriate and how the technologies vary considerably from location to location depending on local conditions					
6. Nature of responses provided by the project participants:					

Section B.5 of the PDD has been updated by considering the host country as the applicable geographical area in line with the tool and presented the common practice analysis in the revised PDD along with the evidence.
7. Assessment of such responses:
PP has now considered the host country as the applicable geographical area and considers the projects of different technologies using publicly available database (CEA Database Version06) applicable at the project start date. Common practice analysis evidence has been provided to the DoE for validation. PDD has been revised accordingly.
8. References to resulting changes in the PDD or supporting annexes:
Section B.5 of PDD

1. Grade / Ref:	CL01	**2. Date:**	07/07/2011	**3. Status:**	Closed
4. Requirement:	Para 55 of VVM Version 01.2 Guidelines for completing Project Design Documents CDM-PDD Version 7.0				
5. Nature of the Issue Raised:					
1. A.2 of PDD needs to be elaborated with respect to the following to enhance clarity on understanding: a. Social well being: How the project activity results in capacity building of the local people? b. Technology well being: How does it differ from current technology of wind, as PDD mentions " the implementation of these new technologies will help in increasing reliability …" 2. Project location map in A.4.1.4 is not legible 3. In section A.4.3 of the PDD, although few of the technical specifications of the WTG are given in the table, the WTG Model, make etc is not specified 4. The annual estimated reductions and total estimated reduction figures of the table in A.4.4 are not correct. 5. MEDA Infrastructure & commissioning clearance for 15nos. WTGs submitted to DOE, PP to submit the MEDA infrastructure & commissioning clearance for the remaining WTGs. PP also to submit other necessary clearances required for the project activity.				
6. Nature of responses provided by the project participants:					
1. The Section A.2 of the PDD is now revised. 2. Project location map in Section A.4.1.4 is now made clear. 3. Model, Make of the WTG is now mentioned in the Section A.4.3 of the revised PDD. 4. The annual estimated reductions and total estimated reduction figures of the table in A.4.4 are now corrected. 5. The MEDA Certificate for the remaining WTG is now submitted to the DOE.					
7. Assessment of such responses:					
1. Section A.2 of the PDD has been updated in the revised PDD, 2. The project location map in Section A.4.1.4 is corrected in the revised PDD.					

3. The WTG model and make are now included in the Section A.4.3 of the revised PDD. 4. Annual emission reductions in Table A.4.4 were now corrected, which has been confirmed from the PDD guidance procedure. 5. PP has submitted MEDA infrastructural clearance and commissioning certificates of the WTGs. The validation team has confirmed the response is appropriate from the site visit observations, discussion with the PP, commissioning certificates and MEDA clearances and supplier quotation. PP has now received MEDA clearance for all 16nos. WTGs implemented for the project activity, the latest evidence for JAI -04 was submitted for the validation.
8. References to resulting changes in the PDD or supporting annexes:
Section A.4.4, A.2, A.4.1.4, A.4.3 of PDD

1. Grade / Ref:	CL02	**2. Date:**	07/07/2011	**3. Status:**	Closed
4. Requirement:	Guidelines for completing Project Design Documents CDM-PDD Version 7.0				
5. Nature of the Issue Raised:					
Section A.2 of the PDD refers to NEWNE as the grid however the project boundary diagram presented in section B.3 refers to “MSEDCL” as the grid.					
6. Nature of responses provided by the project participants:					
The inconsistency is corrected in the revised PDD.					
7. Assessment of such responses:					
Section B.3 of the PDD is now corrected to mention NEWNE grid where the project electricity will be evacuated.					
8. References to resulting changes in the PDD or supporting annexes:					
Section B.3 of PDD					

1. Grade / Ref:	CL03	**2. Date:**	07/07/2011	**3. Status:**	Closed
4. Requirement:	Para 108,109,110 of the VVM Version 01.2 Guidance on the assessment of investment analysis Version 05				
5. Nature of the Issue Raised:					
1. Section B.5 of the PDD states that “Initially, it was decided that 18 WTGs of 2.1 MW each would be set up as part of this project activity. An agreement for the same was also entered into; however, during project implementation, only 17 WTGs will be commissioned” however reason for the same is not stated in the PDD. Also quotation from Suzlon dated 12/03/2010 indicates the price for 18 numbers of WTGs. Please clarify 2. Plant Load Factor (PLF) and the basis for the PLF were not mentioned in the assumptions sheet of IRR analysis. 3. Calculation of average cost of electricity for year 2007-08, 2008-09 and 2009-10 is not correct (denominator is taken as 13 for yearly average instead of 12). Refer rows 31, 64 and 97 in Estimated Savings Sheet 4. Row 10 in IRR Sheet, the saving is calculated on net generation without deducting wheeling and transmission losses. Please clarify					

5. PP to clarify the basis of O&M prices considered after 6th year.
6. SI units are not used throughout the IRR analysis.
7. Calculation of wheeling and transmission losses from 2nd year onwards is not linked with 'assumptions' sheet. Any change in assumption of these two parameters will not get reflected in all years.
8. PP has assumed the tariff rate for electricity by calculating the average tariff rate for year 2007-08, 2008-09 and 2009-10. PP to clarify how this average past rate can be considered standard in the market and why the current tariff rate with appropriate escalation should not be considered as more appropriate parameter.
9. PP has reported residual value under other income and calculated tax including the same under income head. Following needs to be justified :
    a. Residual value of land being capital receipt, is not chargeable to tax and accordingly tax calculation is incorrect
    b. Cost of land is taken as fair value of the project activity assets, however no appreciation in the land cost has been considered. Please clarify
10. PP to justify why the salvage value is not considered in the investment analysis

6. Nature of responses provided by the project participants:

1. The initial agreement was signed for 18 WTGs. However, the PP had to exclude 2 of these due to constraints faced by the WTG supplier. The documentation for the same is made available to the DOE. The project activity now comprises of 16 WTGs of 2.1 MW capacity each.
2. The generation values considered for the IRR analysis are based on the Quotations as mentioned in the IRR spreadsheet. These generation values are inclusive of the PLF and hence the same is not recalculated in the IRR sheet. The Quotations have been submitted to the DOE.
3. The calculation of the average cost is corrected in the revised spreadsheet.
4. The calculation is revised to include the wheeling and transmission losses in the computation of the net generation.
5. The O&M considered is taken as per the terms of the O&M quotation Since, the contract for O&M services is signed only for a period up to 10 years and no contract is available for the 10th year onwards, the same terms of O&M are considered beyond 10th year.
6. Assumptions sheet is updated to SI units.
7. The error is corrected in the revised financial spreadsheet
8. The savings in this power consumption are considered for the calculation of the project returns. The savings are estimated using data of the power consumption by the PP and tariff rates for a historical period of three years. Since the average of the tariff rate for the three years is used, an escalation is not considered for the same. However, it may be noted that even on application of an annual escalation factor of 3.06% on the estimated savings per unit, the returns from the project remain below the benchmark. This annual escalation factor is derived as a Compounded Annual Grown Rate (CAGR) of the MSEDCL tariff rates for High Tension Industries over a period of 5 years (2006-2010).
9. The tax calculation is corrected as indicated by the DOE. Cost of land is assumed to be a non-appreciable and non-depreciable asset for the financial calculations
10. A salvage value of 10% is now considered in the analysis.

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7. Assessment of such responses:

1. Though 18 WTGs was proposed to be implemented initially and accordingly it was approved in the Board meeting, the PO has implemented only 16 nos. of WTGs as verified from the Purchase Order dated 05/08/2010 (18nos), amended PO dated 28/10/2010 & 01/11/2010 for 17 nos. The validation team has finally confirmed from the commissioning certificates and through site visit that PP has implemented 16 WTGs of each 2.1MW capacity under the project activity. The PP had initially conceptualised for implementing 18 WTGs of 2.1 MW each, but implemented a total capacity of 33.6 MW with 16 WTGs of 2.1 MW each, due to the constraints faced by the PP in procurement of land for the installation and commissioning of two WTGs (JAI-01, JAI-06), PP has

withdrawn the 2WTGs. The validation team reviewed the following evidence:

- Letter from the WTG supplier Suzlon dated 18/10/2010 indicating that the 13WTGs out of 18 WTGs are clear and 5WTGs (JAI-06, JAI-25 & JAI-26, JAI-10 & JAI-20)facing the site constraints with regard to the land acquisition for installation and commissioning. The PP has withdrawn the WTG at the location JAI-06, and opted for alternatives of JAI-04, JAI-11,JAI-21,JAI-22 as suggested by the WTG supplier.
- Letter from the WTG supplier Suzlon dated 03/03/2011 with regard to the status of 17WTGs selected by the PP; 7WTGs are cleared from MEDA infrastructural clearance, the MEDA infrastructure clearance is expected for 8 WTGs expected, and 2WTGs are delayed at JAI-01 & JAI-04 due to the unforeseen right of way (land acquisition) problem.
- Letter from WTG supplier Suzlon dated 09/07/2011 indicating that the project development work started at JAI-04 location, but the right of way (land) issue is pending and not settled. Hence the PP has withdrawn the location JAI-01. The PP has withdrawn WTGs at Locations JAI-06, JAI-01 due to the site constraints (Right of Way land issues), and a total of 16nos. WTGs were installed and commissioned as against the envisaged 18Nos. of WTGs (as per the purchase order). The validation team confirmed the installation and commissioning through the MEDA Clearance, commissioning certificates and site visit.

2. The estimated net generation was sourced from the supplier quotation available at the time of decision making. Supplier quotation dated 12/03/2010 specified the net generation would be 3,600 MWh/WTG. (Refer to section xi page 4 of offer). The estimation of energy generation from the techno commercial evaluation PLF study by a third party Consolidated Energy Consultants Limited (CECL) report dated 22/05/2010. The report specifies a net generation (average of 18WTGs) of 3,485 MWh/WTG with a CUF of 18.94%. (Refer to section 9 of page 14 and table 3 of page 23). The PP has considered higher net generation of 3600 MWh/WTG based on the supplier quotation which is conservative for the IRR analysis.
3. Calculation of average energy cost has been corrected in the revised IRR sheet.
4. PP has now included the wheeling and transmission losses in the net electricity generation calculation in the IRR sheet.
5. O & M -The project participant has not yet signed an O&M contract for the project activity. The escalation considered in the investment analysis is as per the quotation for O&M available at the time of decision making. Based on this quotation, the escalation of 5% is considered annually up to the 6th year of the project activity. Since no value of escalation is available for the period after 6 years, the same escalation rate is considered for the project lifetime of 20 years.
6. SI units have been indicated in the IRR sheet.
7. Calculation of wheeling and transmission losses from 2nd year onwards is now linked with 'assumptions' sheet
8. The PP has considered an escalation factor based on the variation of power tariff rates of 2006 and 2010. The Government of India enacted the Electricity Act in the year 2003 to harmonize and rationalize the provisions in the then existing laws in India. The Act consolidated the laws relating to generation, transmission, distribution, trading and use of electricity. With the enactment of the act, the then existing laws viz, The Indian Electricity Act 1910, The Electricity Supply Act, 1948 and The Electricity Regulatory Commissions Act, 1998 were repealed. Since post-enforcement of this act, the first MERC Tariff Order was issued in the year 2006, other regulations based upon previous repealed acts have not been considered. And hence the selected period for analyzing the trend in tariff escalation is found to be appropriate. The annual escalation factor of 3.06% is derived as CAGR of MSEDCL tariff rates for high tension industries over a period of 5 years. The validation team has confirmed the approach of CAGR on MSEDCL tariff rates for high tension industries over a period of 5 years and application of the escalation factor on the estimated energy savings rate over a period of 20 years is appropriate and conservative. Even after applying annual escalation on the tariff rate, the IRR does not cross the benchmark.
9. PP has now corrected the tax calculation. The Cost of land is assumed to be a non-appreciable and non-depreciable asset for the financial calculations.
10. Salvage value of 10% has now been considered in the investment analysis for the project activity.

8. References to resulting changes in the PDD or supporting annexes:

Section B.5 of PDD and IRR sheet.