

Validation Report

Report for:
CLP Wind Farms (India) Private Limited

Validation of CDM project for
**Wind Energy Project in Harapanahalli,
Karnataka**

LRQA Reference : CDM-MUM-0061741
Version 4.1
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Contents

1	<i>Executive Summary</i>	3
2	<i>Introduction</i>	6
2.1	Objective.....	6
2.2	Scope.....	6
2.3	GHG Project Description.....	7
3	<i>Methodology</i>	7
3.1	Review of documents.....	7
3.2	Site Visit & Follow-up interviews	7
3.3	Resolution of clarification and corrective action requests.....	8
3.4	Internal quality control.....	9
4	Validation protocol and conclusions	9
4.1	Approval	9
4.2	Participation requirements	10
4.3	Project design document.....	10
4.4	Project description	10
4.5	Baseline and monitoring methodology	12
4.6	Additionality of a project activity.....	13
4.7	Monitoring Plan	15
4.8	Local stakeholder consultation.....	15
4.9	Environmental impacts.....	16
4.10	Summary of Changes.....	16
5	<i>Comments by parties, stakeholders and NGOs</i>	17
6	<i>Validation Opinion</i>	18
7	<i>Appendices</i>	19
7.1	Appendix A: Letter of approval for the project by the host and investing country DNA	19
7.2	Appendix B: List of documents reviewed	19
7.3	Appendix C: List of persons interviewed	22
7.4	Appendix D: How due account has been taken to the public input made to the validation requirements.....	22
7.5	Appendix E: Certificate of Appointment	33
7.6	Appendix F: Validation Protocol and findings log	34

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1 Executive Summary

Lloyd's Register Quality Assurance Limited has been contracted by CLP Wind Farms (India) Private Limited, the project participant (PP), to undertake validation of the proposed project activity "Wind Energy Project in Harapanahalli, Karnataka". The validation has been performed through a process of document review based on the project design document, Version 01 dated 14/04/2011 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 a wind power project of capacity 39.6 MW comprising of 24 Wind Turbine Generators (WTGs), each with rated capacity of 1650 kW. The purpose of the project activity is to generate electricity by utilising the renewable wind potential available in the region, so there will be no GHG emissions. The project activity shall achieve GHG emission reductions by supplying the net electricity generated to the Southern grid which is predominantly dependent on fossil fuel based power plants.

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 07 CARs. 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 Version 08 dated 07/06/2012 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 Energy Project in Harapanahalli, Karnataka" to the CDM Executive Board as a CDM project activity.

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Abbreviations

AIR	Additional Information Request
BE	Baseline emissions
BESCOM	Bangalore Electricity Supply Company
BM	Build Margin
BSE	Bombay Stock Exchange
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
CLPWFL	CLP Wind Farms (India) Private Limited
CM	Combined Margin
COP/MOP	Conference of the Parties serving as meeting of the Parties to the Kyoto Protocol
DNA	Designated national authority
DOE	Designated operational entity
EF	Emission factor
EIA	Environmental impacts assessment
ERPA	Emissions reduction purchase agreement
FAR	Forward action requests
GBI	Generation Based Incentive
GHG	Greenhouse gas
GSP	Global stakeholders' consultation process
GWh	Giga Watt Hour
IREDA	Indian Renewable Energy Development Agency
IMF	International Monetary Fund
IDC	Interest During Construction
IPCC	Intergovernmental panel on climate change
IPP	Independent Power Producer
IRR	Internal rate of return
KP	Kyoto Protocol of the United Nations Framework Convention on Climate Change
KPTCL	Karnataka Power Transmission Corporation Limited
kW / kWh	Kilowatt / Kilowatt hour
LE	Leakage emissions
LoA	Letter of approval
LR	Lloyd's Register
LRQA	Lloyd's Register Quality Assurance Limited
LTAEO	Long Term Annual Energy Output
MAT	Minimum Alternate Tax
MW / MWh	Mega watt / Mega watt hour
NCV	Net calorific value
NGO	Non governmental organization
MNRE	Ministry of New and Renewable Energy
ODA	Official development aid
OM	Operating Margin
O&M	Operation and Maintenance
PDD	Project design document
PE	Project emissions

PP	Project participant
PPA	Power Purchase Agreement
PLF	Plant Load Factor
SLM	Straight Line Method
tCO ₂ e	Tonnes of carbon dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change
UTM	Universal Traverse Mercator
WTGs	Wind Turbine Generators
WDV	Written Down Value

2 Introduction

The project participant (PP), CLP Wind Farms (India) Private Limited (CLPWFPL) has contracted with Lloyd's Register Quality Assurance Limited (LRQA) to undertake validation of the proposed project activity "Wind Energy Project in Harapanahalli, Karnataka". This report summarises 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:

Imran Ustad	LRQA Ltd. India	Team Leader CDM Lead Validator Sector Expert
Shubha Shanbhag	LRQA Ltd. India	Team member CDM Lead Validator Sector Expert
Prabodha C Acharya	LRQA Ltd. India	Technical reviewer Sector Expert
Andrew Ritchie	LRQA Ltd.	Decision maker

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 03). LRQA is designated as an operational entity and holds the full responsibility of decision-making regarding the validation, in accordance with the accreditation requirements of the CDM-EB. The certificate of appointment of the team personnel is attached to this report.

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

The project activity involves installation of a wind power project of capacity 39.6 MW comprising of 24 Wind Turbine Generators (WTGs), each with rated capacity of 1650 kW. The purpose of the project activity is to generate electricity by utilising the renewable wind potential available in the region, so there will be no GHG emissions. The project activity shall achieve GHG emission reductions by supplying the net electricity generated to the Southern grid which is predominantly dependent on fossil fuel based power plants.

The validation team confirms that the Wind Turbine Generators (WTGs) of Vestas of capacity 1650 kW are based on proven technology used elsewhere in the host country for electricity generation using wind energy.

The annual net electricity generation by the project is estimated at 81,200 MWh and the annual emission reduction has been estimated as 72,834 tCO₂e.

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 dated 14/04/2011 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 issued by LRQA. The documents reviewed by LRQA are listed in Appendix B. LRQA reviewed the final version of the PDD Version 08 dated 07/06/2012 to confirm that all changes agreed had been incorporated.

3.2 Site Visit & 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
19/05/2011	Project site/ Substation Davangere/ Karnataka	Technology supplier Local stakeholders Representative from project participant	• Selection of technology & Selection of site • Project boundary issues • Performance of WTGs, Power generation, grid availability, PLF, Machine availability, losses etc • Physical identification of WTG based on unique identification number • Procedures for monitoring & reporting, QA/QC systems, training programme • Data collection, monitoring,	Shubha Shanbhag

Date	Location/ Address	Party Interviewed	Subjects Covered	Team Members on Site
			recording at Central Monitoring station, discussion about the WTG controller and the data apportioning procedure • Electricity metering provision, Calibration schedule of meters • Institutional arrangement of data collection and archiving • Record keeping – daily production report, operation log • Provisions for internal audits • Emergency preparedness • Projects contribution to sustainable development • Legal requirements/ Other Statutory requirements • Discussion on sublease of land • Discussion on environmental impact assessment of the project • Discussion on local stakeholder consultation process • Invitation letters issued to local villagers • Representation by stakeholders in stakeholders' consultation meeting • Minutes of meeting –Comments, action taken • Employment of local skilled and unskilled people • Views on the project activity	

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 whilst 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 authorised decision maker were conducted prior to the submission of the validation report to the PP and prior to 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, reference number 4/22/2011-CCC dated 10/04/2012 has been received. This letter of approval confirms the contribution of the project activity Wind Energy Project in Harapanahalli, Karnataka 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

CLP Wind Farms (India) Private Limited is 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 authorised, as confirmed in the LoA issued by the DNA of the Parties concerned. The team confirmed that no entities other than the authorised entities are indicated as project participants 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 installation of wind power generation of total capacity of 39.6 MW consisting of twenty four WTGs (24 x 1650 kW) connected to the Southern grid system in the host country, India, to displace the predominantly fossil fuel based power generation and thereby reducing the GHG emissions.

The details on the location of the project activity WTGs were confirmed as Harakanalu village, Arsanahalu village, Hyarada village and Dasanahalli village in Harapanahalli taluka of Devangere District, Karnataka, India as given in the section A.4.1.4 of the PDD. The geographic coordinates of the project activity in latitude and longitude were confirmed as below:

Turbine ID	Latitude (Degree, Minute, Second Format)	Longitude (Degree, Minute, Second Format)
H15	14° 48' 20.5"N	75° 50' 36.5"E
H16	14° 48' 31.6" N	75° 50' 25.8"E
H17	14°48' 42.6" N	75° 50' 21.2"E
H18	14° 48' 50.1" N	75° 50' 24.4"E
H19	14° 48' 36.9" N	75° 49' 47.5"E
H20	14° 48' 47.8" N	75° 49' 43.2"E
H21	14° 49' 07.4" N	75° 49' 42.0"E
H22	14° 49' 16.4" N	75° 49' 46.1"E
H23	14° 49' 24.1" N	75° 49' 42.5"E
H24	14° 49' 19.3" N	75° 49' 22.7"E
H25	14° 49' 37.0" N	75° 49' 14.7"E
H26	14° 49' 50.4" N	75° 49' 12.6"E
H27	14° 49' 43.7" N	75° 48' 50.4"E
H28	14° 50' 00.1" N	75° 48' 46.3"E
H29	14° 50' 17.2" N	75° 48' 37.5"E
H30	14° 50' 26.2" N	75° 48' 44.1"E
H31	14° 50' 37.6" N	75° 48' 37.3"E
H32	14° 50' 42.2" N	75° 48' 22.1"E
H33	14° 50' 50.3" N	75° 48' 17.2"E
H34	14° 50' 47.4" N	75° 48' 35.7"E
H35	14° 51' 00.5" N	75° 48' 33.2"E
H36	14° 51' 13.9" N	75° 48' 08.0"E
H37	14° 51' 24.7" N	75° 47' 59.6"E
H38	14° 51' 33.0" N	75° 47' 54.5"E

The WTGs are supplied by Vestas and are connected to the Southern grid system of India. Net electricity generated will displace the grid electricity which is predominantly fossil fuel based, thereby reducing the GHG emissions.

The expected net PLF from the project activity is 23.41% as presented in the Long Term Annual Energy Output Assessment (Third party PLF assessment study) conducted by Hydro Tasmania Consulting. This is in line 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). The third party firm estimated a net PLF of 23.41%. In addition to the above document, it was noted that the bank (IDFC-Infrastructure Development Finance Company Ltd) from where the loan is availed has certified that the project (vide letter dated 29/04/2011) was evaluated for debt financing based on the estimated generation of 81 GWh which corresponds to PLF as quoted by the third party assessment report.

The description of the project activity has been confirmed through the site survey, interview and review of project related documents. 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, arrangements for O&M and necessary clearances for setting the project activity. The technical specifications of the project

provided in the PDD were confirmed during the site survey and also from the technical specifications provided by the WTG supplier. 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 V-82 of Vestas has been listed by 'Centre for Wind Energy Technology', Govt. of India confirming availability of type certificate.

The accuracy and completeness of the project description was validated by document review including offer letter from the technology supplier, purchase orders, tariff order, commissioning certificates, purchase orders, PPA, interview, and field survey. (Refer Appendix B of the validation report).

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: 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. However, projects applying ACM0002 Version 12.3.0 can be submitted for requests for registration until 11 Jan 2013 23:59:59 GMT.

LRQA confirms 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 documentation review on commissioning certificate, PPA, interview and field survey. This information was substantiated via cross-check with CO₂ baseline database Version 6.0 which is the latest version available at the time of submission of the PDD for validation. Through the processes undertaken, 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, e.g. 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 valid from 17/09/2010 to 10/05/2012. However, projects applying ACM0002 Version 12.3.0 can be submitted for requests for registration until 11 Jan 2013 23:59:59 GMT. 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 the 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 valid from 17/09/2010 to 10/05/2012. However, projects applying ACM0002 Version 12.3.0 can be submitted for requests for registration until 11 Jan 2013 23:59:59 GMT.

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 analysis for which the PP has applied 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.

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 13/08/2010, the earliest date on which the agreement was signed between CLPWFPL and technology supplier, Vestas Wind Technology India Private Limited 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 power purchase agreements.

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 17/08/2010, which is within six months of the project activity start date (i.e.13/08/2010). 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 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 “Guidelines 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”.

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 India as a default geographical region for carrying out common practice analysis.

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 valid from 17/09/2010 to 10/05/2012. However, projects applying ACM0002 Version 12.3.0 can be submitted for requests for registration until 11 Jan 2013 23:59:59 GMT.

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 06/01/2011. The local stakeholder consultation meeting was held at Harapanhalli Substation on 01/02/2011 prior to the publication of the PDD on the UNFCCC website. The local stakeholder consultation was attended mainly by local villagers and farmers. The following persons and entities attended the stakeholders meeting¹:

1. Krishna Naik, local villager
2. L. Yevaraja Naik, local villager
3. Ningu Naik, local villager
4. L. Devendra Naik, local villager
5. Peerya, local villager
6. Laxmana Naik, local villager
7. Lokesh Naik, local villager
8. T.Prabhu, local villager
9. Mansya Naik, local villager
10. Ramu Naik, local villager

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.

¹ In all there were more than 25 local villagers who attended the local stakeholder meeting. A few names of local villagers have been presented in the validation report.

4.9 Environmental impacts

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

For details, 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 dated 14/04/2011 was modified and several changes occurred due to the result of validation process. The PDD Version 08 dated 07/06/2012 includes all these changes.

For details about the results of the responses to CARs, 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 version of the applied methodology and tool (ACM0002 version 12.3.0 and Additionality tool version 06.0.0 now applied)
2. Change in project cost (refer Closure of CAR04)
3. Change in IRR value (refer Closure of CAR04)
4. Change in monitoring plan (refer closure of CAR05)
5. Change in common practice analysis (refer closure of CAR07)

5 Comments by parties, stakeholders and NGOs

In accordance 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 accordance with the requirements of the procedure for the period of 19 Apr 11 - 18 May 11 as per <http://cdm.unfccc.int/Projects/Validation/DB/ROMYOMLK0SS9E3H39SES13PWHS2O0J/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/ROMYOMLK0SS9E3H39SES13PWHS2O0J/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 Energy Project in Harapanahalli, Karnataka 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 installation of a wind power project of capacity 39.6 MW comprising of 24 Wind Turbine Generators (WTGs), each with rated capacity of 1650 kW. The purpose of the project activity is to generate electricity by utilising the renewable wind potential available in the region, so there will be no GHG emissions. The project activity shall achieve GHG emission reductions by supplying the net electricity generated to the Southern grid which is predominantly dependent on fossil fuel based power plants.

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 07 CARs. 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 72,834 tCO₂e and contribute to the sustainable development of the host country. Therefore LRQA requests the registration of "Wind Energy Project in Harapanahalli, Karnataka" to the CDM Executive Board as a CDM project activity.

Decision Maker



Andrew Ritchie
Climate Change Services Manager
11th June 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) 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 14/04/2011, Version 02 dated 27/07/2011, Version 03 dated 29/08/2011, Version 04 dated 14/12/2011, Version 05 dated 20/02/2012, Version 06 dated 17/05/2012, Version 07 dated 22/05/2012 and Version 08 dated 07/06/2012.
2. Emission Reduction & Investment Analysis calculation spreadsheet Version 01 dated 14/04/2011, Version 02 dated 27/07/2011, Version 03 dated 29/08/2011, Version 04 dated 14/12/2011, Version 05 dated 20/02/2012, Version 06 dated 17/05/2012, Version 07 dated 22/05/2012 and Version 08 dated 07/06/2012
3. Benchmark calculation sheet Version 01 dated 14/04/2011, Version 02 dated 22/05/2012 and Version 03 dated 07/06/2012
4. Certificate of Incorporation dated 29/07/2008
5. Copy of Technical Specifications for V82 1650 kW type WTG
6. Letter from Director of CLP Wind Farms (P) Ltd clarifying no ODA/public funding has been availed by the project dated 27/04/2011
7. Supply Agreement between CLPWFPL and Vestas Wind Technology India Private Limited dated 13/08/2010
8. Service and Availability Agreement between CLPWFPL and Vestas Wind Technology India Private Limited dated 13/08/2010
9. Erection & Commissioning Agreement between CLPWFPL and Vestas Wind Technology India Private Limited dated 13/08/2010
10. Development and Facilitation Agreement between CLPWFPL and Chitradurga Wind Power Private Limited Subsidiary of Vestas Wind Technology India Private Limited dated 13/08/2010
11. Letter from The Infrastructure Development Finance Company Limited (IDFC) for project PLF dated 29/04/2011
12. Letter to Forest, Ecology and Environment department for diversion of forest land to wind power project dated 24/03/2009
13. Letter to Forest, Ecology and Environment department for diversion of forest land to project dated 13/08/2009
14. Work order from Deputy conservator of Forest dated 03/04/2010
15. Lease deed for agreement for temporary occupation of forest land for non-forestry purposes dated 03/04/2010
16. E-mail communication between the PP and insurance provider for Insurance charges dated 14/06/2010

17. Mail from Vestas giving the details of land lease rentals 30/09/2009
18. Screen shot of State Tariff rates at website
(http://www.indianwindpower.com/policy_environment.php)
19. Power Purchase Agreement between CLPWFPL and Bangalore Electricity Supply Company Limited dated 28/12/2010
20. IT depreciation rates as published by income tax India website.
21. GBI Scheme announced by MNRE dated 17/12/2009
22. Operational Guidelines of GBI by IREDA
23. Supporting for MAT Rate as per the Finance Bill 2010
24. Board meeting resolution dated 27/07/2010
25. F-CDM dated 17/08/2010
26. Commissioning Certificate issued by KPTCL dated 21/01/2011 (for 8 WTGs)
27. Commissioning Certificate issued by KPTCL dated 28/02/2011 (for 16 WTGs)
28. Addendum to CDM Engagement with Ernst & Young dated 16/03/2011
29. Bulk Meter Calibration Report by KPTCL dated 26/02/2011
30. Form –B issued by KPTCL for January 2011
31. Form –B issued by KPTCL for February 2011
32. Energy invoices from CLPWFPL to BESCO limited for month of January 2011
33. Energy invoices from CLPWFPL to BESCO limited for month of February 2011
34. Approval for electrical installation from Chief Electrical Inspector of Government Office dated 19/01/2011, 01/03/2011
35. Invitation letter for the Local Stakeholders Consultation meeting dated 06/01/2011
36. Attendance Sheet for the Local Stakeholders Consultation dated 01/02/2011
37. Photographs of Local Stakeholder Consultation meeting
38. Minutes of Local Stakeholders Consultation Meeting dated 01/02/2011
39. Long Term Annual Energy Output Estimate (300082-TR01-Rev3) by Hydro Tasmania Consulting 16/06/2010
40. GBI Application letter to IREDA from CLPWFPL dated 21/03/2011
41. WTG type certificate issued by DNV (IEC TC-212401-0) dated 06/02/2008
42. Non binding project proposal for setting up 39.6 MW wind farm submitted by Vestas Wind Technology India Private Limited to CLP dated 12/03/2010
43. Asset Manager Cost Break up
44. Letter of Intent from CLP Wind Farms (India) Pvt Ltd to IDFC dated 08/12/2010
45. Professional Services Contract with Hydro-Electric Corporation (trading as Hydro Tasmania Consulting) for Technical due diligence dated 30/09/2009
46. Work order placed to Power Research & Development Consultants Private Limited for Transmission Advisory services dated 19/08/2009
47. Work order placed to Trilegal for legal due diligence 29/07/2009
48. Consent to act as Security Trustee for Gujarat Paguthan Energy Corporation Private Limited from IDBI Trusteeship Services Ltd dated 21/10/2008

49. Work order placed to TATA Consulting Engineers Limited for Environmental impact assessment dated 19/10/2010
50. Contract for Provision of Professional Services between CLP Wind Farms India Private Ltd and SGS India Private Limited dated 23/10/2009 (for 99 MW earlier CLP project at Theni)
51. Contract for Provision of Professional Services between CLP Wind Farms India Private Ltd and SGS India Private Limited dated 09/03/2009
52. Development and Facilitation Agreement between Gujarat Paghutan Energy Private Limited and Vestas Wind Technology India Private Limited dated 31/08/2009
53. Contract for Provision of Professional Services between CLP Wind Farms India Private Ltd and SGS India Private Limited dated 20/10/2010
54. Mail from CLPWFPL to UNFCCC giving the prior consideration notification dated 17/08/2010
55. Acknowledgement mail from UNFCCC dated 31/08/2010
56. Mail from CLPWFPL to Host country DNA dated 17/08/2010

Category B documents (other documents referenced)

1. ACM0002-“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
3. CO₂ Baseline Database for the Indian Power Sector, User Guide Version 6.0
4. Tool for demonstration and assessment of additionality (Version 5.2, EB 39)
5. Tool for demonstration and assessment of additionality (Version 6)
6. User guide version 6.0 CO₂ baseline database for Indian power sector.
http://cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm
7. Clean Development Mechanism Project design document form (CDM- PDD)
8. Guidelines for completing the Project Design Document (CDM-PDD) and the Form for proposed new small scale methodologies (CDM-NM) Version 07
9. Guidelines on the Assessment of Investment Analysis version 05 (Annex 5 to the report of 62nd meeting of the CDM-EB)
10. Guidelines on the Demonstration and Assessment of prior consideration of the CDM (Version 04)
11. Guideline for the reporting and validation of plant load factors (Version 01)
12. Clean Development Mechanism Validation and Verification Manual version 1.2 (Annex 01, EB 55)
13. Eligibility Criteria for Host Country Approval, National CDM Authority, Ministry of Environment & Forests
14. Notification by Ministry of Environment & Forests dated 01/12/2009
15. Tariff order for Karnataka Electricity Regulatory Commission dated 11/12/2009
16. Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006
17. CEA data base for power plants (<http://www.cea.nic.in/>)

18. MW size Grid Solar Power Plants in India -
http://www.renewablemarketsindia.com/attachments/4490_MNRE_List%20of%20MW-size-Grid-Solar-Power-Plants-in-India.pdf
19. Biomass based power projects from the following publicly available sources:
- http://www.nedcap.gov.in/Biomass_Energy.aspx?ID=31
 - http://www.credacq.org/bpg_projects_commissioned.htm
 - <http://www.kredltest.in/Bioreport.aspx>
 - <http://www.kredltest.in/cogenreportallnew.aspx>
 - <http://peda.gov.in/eng/cogeneration.html>
 - <http://www.teda.in/index.php?r=site/index&id=2O8i9U4E3U>
 - <http://neda.up.nic.in/PRAGATI/08-09/PRAGATI-08-09.HTM>
 - <http://neda.up.nic.in/PRAGATI/09-10/PRAGATI-09-10.HTM>
 - <http://neda.up.nic.in/PRAGATI/10-11/PR-10-11-P1-11.pdf>

7.3 Appendix C: List of persons interviewed

CLP Wind Farms (India) Private Limited

Dipjay Sanchania (Head CDM)
Kajal Raut (Asset Manager)

Vestas Wind Technology India Private Limited

Satish V. Vernekar (Area Service Manager, Customer Service)
Mahesh Arali (Manager, Customer Service)

KPTCL

Sudhir Naik (Substation Engineer)

Local Villagers

S. Murali (Security Guard)
Srinivasan. M (Farmer)
Peerya (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 19 Apr 11 - 18 May 11 as per

<http://cdm.unfccc.int/Projects/Validation/DB/ROMYOMLK0SS9E3H39SES13PWHS200J/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:

GSC Comment No. 1	Response from PP	Evaluation of response and conclusion
1. The calculation of project IRR is not as per "Guidance on the Assessment of Investment Analysis' Version 03, EB 51, Annex 58"	1. The project proponent has chosen Equity IRR as the financial indicator to prove additionality. All the calculations have been carried out using standard accounting practices and are complying with the "Guidelines on the Assessment of Investment Analysis' Version 05, EB 62, Annex 5"	Validation team confirms that the IRR is appropriately calculated and is in accordance with the latest "Guidelines on the Assessment of Investment Analysis" (Version 05, EB 62, Annex 5). Refer section 6c of the protocol for the detailed validation opinion on the investment analysis section.
2. Whether pre-tax or post tax IRR is selected is not demonstrated in the PDD.	2. The Equity IRR calculated in the PDD is post tax IRR and the same is updated in the PDD.	The Equity IRR calculated in the PDD is post tax IRR
3. 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.	3. The project activity has considered Equity IRR as the financial indicator and hence Return on Equity (RoE) has been chosen as the appropriate benchmark. The project activity has not considered PLR as the benchmark and hence the comment is not relevant to the project activity.	Validation team confirms that the Benchmark is appropriately calculated and is in accordance with the latest "Guidance on the Assessment of Investment Analysis". Refer section 6c of the protocol for the detailed validation opinion on the benchmark. Also, refer closure of CAR06
4. The service tax rate of 10.3% is not clear. Pls. clarify.	4. Service tax rate is 10%. In addition to this there is an education cess of 3% (Primary Education cess of 2% + Secondary Education cess of 1%). Hence total rate of 10.3% is used as total value.	The PP has considered the service tax based on the host country regulation, hence the service tax considered for the project is deemed appropriate. Refer section 6c of the protocol for the detailed validation opinion on the input values.
5. Derating factor, array efficiency of the wind energy system is not depicted in the PDD. Pls. clarify.	5. The Net saleable energy used for estimating emission reductions and calculating the Equity IRR, has been derived from wind assessment study prepared by a third party - Hydro Tasmania Consulting (HTC). This study has been carried out using onsite data and various assumptions which have been enlisted in the report. This report has been shared with the DoE during validation.	The expected net PLF from the project activity is 23.41% as presented in the Long Term Annual Energy Output Assessment (Third party PLF assessment study) conducted by Hydro Tasmania Consulting. This is in line 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). The third party firm estimated a net PLF of 23.41% and the

GSC Comment No. 1	Response from PP	Evaluation of response and conclusion
		same is used in the investment analysis. The study report does not consider any derating in the machines. Neither does the study consider array efficiency.
6. Debt/Equity ratio should be based on recent investment done by the Project proponent.	6. The typical debt to Equity ratio for a renewable energy project, especially wind power project observed is 70:30. The debt: equity ratio of 70:30 is used which is in the same range of the typically observed ratios for similar projects in the region. Further the recent investment decisions taken by the project proponent also approximately 70:30	The PP has considered the Debt/Equity ratio based on the similar projects in the region and is deemed appropriate. Refer section 6c of the protocol for the detailed validation opinion on the input values.
7. DOE has to check the chronology of events, no purchase order details, investment decision date.	7. The chronology of events related to the project activity and the efforts of the project proponent to secure CDM funding for the project activity (Including the prior consideration of CDM) have been summarized in PDD section B.5	Validation team confirms that the chronology of events is now appropriately described in the revised PDD. 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. Refer section 6a of the protocol for the detailed validation opinion. Also, refer closure of CAR03
8. Prior consideration of CDM which is important for the determination of additionality is not documented in the section B.5 of the PDD.	8. The chronology of events related to the project activity and the efforts of the project proponent to secure CDM funding for the project activity (Including the prior consideration of CDM) have been summarized in PDD section B.5	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 17/08/2010, of their intention to seek CDM status. The validation team confirmed the notification to host party DNA and UNFCCC. Further, the intimation was also confirmed from the list of notifications received by the UNFCCC available from the UNFCCC website. Thus,

GSC Comment No. 1	Response from PP	Evaluation of response and conclusion
		LRQA confirms that the CDM was seriously considered in the decision to implement the project. Refer section 6a of the protocol for the detailed validation opinion.
9. The justification of choosing EIRR as financial indicator is not adequately justified. Whether it is equity or project EIRR, pre-tax or post tax is not mentioned in the PDD.	9. The project proponent has chosen Equity IRR as the financial indicator to prove additionality. All the calculations have been carried out using standard accounting practices and are complying with the "Guidelines on the Assessment of Investment Analysis' Version 05, EB 62, Annex 5". It is a post-tax IRR	Validation team confirms that the IRR is appropriately calculated and is in accordance with the latest "Guidelines on the Assessment of Investment Analysis". Refer section 6c of the protocol for the detailed validation opinion on the investment analysis section.
10. 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.	10. Off-grid power plants have not been included in the project electricity system.	Validation team confirms that the emission factor is appropriately calculated and is in accordance with the "Tool to calculate the emission factor for an electricity system" Version 02". Refer section 5b & 5c of the protocol for the detailed validation opinion on the selection of emission factor for the project electricity system.
11. Justification of parameters including O&M, insurance, loan, derating, escalation, and tariff are not demonstrated with justification. Refer B.5.	11. The PDD section B.5 has been updated to provide the source of data used for all the assumptions/input parameters	Refer section 6c of the protocol for the detailed validation opinion on the input values.
12. Please provide a proof for proposed debt to equity taken at the investment decision. Refer B.5	12. See response to comment no 6	Refer conclusion given in comment no 6
13. Proof for PLF is not justified.	13. As per para. 3 of the "GUIDELINES FOR THE REPORTING AND VALIDATION OF PLANT LOAD FACTORS", the PLF can be defined ex-ante by using "The plant load factor determined by a third party contracted by the project participants".	Refer conclusion given in comment no 5

GSC Comment No. 1	Response from PP	Evaluation of response and conclusion
	The PLF/net generation has been estimated using the third party (HTC) report which has already been shared with the DoE. Further the term loan also has been sanctioned considering the same PLF/net generation. Thus the ex-ante choice of PLF/net generation is justified.	
14. Date of offer is not provided	14. The Offer provided by Vestas was dated 12/03/2010. The copy of the offer document has been shared with the DoE.	The offer document has been reviewed by the validation team and is found to be appropriate.
15. Project cost is not as per state norms. Refer B.5.	15. The PP has prior experience in setting up similar projects in India. Some of its projects are currently registered or at different stages in the CDM pipeline. The project cost has been estimated based on the offer provided by the technology supplier and other parameters which were available to the PP at the time of decision making. The same can be verified by the DoE during project validation.	Refer section 6c of the protocol for the detailed validation opinion on the input values.
16. O&M charges and its escalation is not as per norms	16. O&M charges and its escalation are as per the offer provided by the supplier (Vestas) on 12/03/ 2010. The copy of the offer document has been shared with the DoE	Refer section 6c of the protocol for the detailed validation opinion on the input values.
17. IT rate assumed is not as per standard practice.	17. The Income Tax rates – (Corporate & MAT) are derived from the Indian IT Act prevailing at the time of decision making (Link: http://law.incometaxindia.gov.in/DIT/Income-tax-acts.aspx)	Refer section 6c of the protocol for the detailed validation opinion on the input values.
18. The application of MAT which is based on tax holiday while calculating WACC is not appropriate.	18. The MAT has been applied only for the years wherein the project is eligible for claiming tax holiday under section 80 IA. Post the 15 th year of operation, the project has considered MAT credit as well which is in line with the Indian IT Act.	Validation team confirms that applying MAT and accounting for MAT credit is in line with host country taxation laws and is appropriate.
19. The PP has not explained and justified the key assumptions and rationale.	19. The PDD has been updated to address this point.	Revised PDD includes the key assumptions and rationale
20. The PP and consultant has not illustrate in a transparent manner all data used to determine the baseline emissions.	20. The PDD has been updated to address this point.	Revised PDD includes the key data used for calculation of emission reductions

GSC Comment No. 1	Response from PP	Evaluation of response and conclusion
21. Not demonstrated that the proposed project activity is additional as per options provided under attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities.	21. The project activity under discussion is not a small scale project. The additionality has been demonstrated in the CDM PDD as per the latest "Tool for demonstration and assessment of Additionality" which is also recommended by the applicable approved methodology.	The additionality has been demonstrated in the PDD as per the latest "Tool for demonstration and assessment of Additionality"
22. National policies and circumstances relevant to the baseline of the proposed project activity are not being summarized clarify.	22. National policies and circumstances relevant to the baseline of the proposed project activity had already been summarized in the web hosted PDD section B.5	Validation team confirms that national policies and circumstances relevant to the baseline of the proposed project activity had already been summarised in the web hosted PDD section B.5 and hence no further change needed.
23. Explain and justify all relevant methodological choices for the proposed project activity	23. All relevant methodological choices for the proposed project activity have been justified in PDD section B.6.1	Validation team confirms that all relevant methodological choices for the proposed project activity have been justified in PDD section B.6.1
24. Prior consideration of CDM which is important for the determination of additionality is not documented in the section B.5 of the PDD.	24. same as response to comment no 7&8	Refer conclusion given in comment no 7 & 8.
25. Date of PPA is not mentioned in the prior consideration of CDM	25. same as response to comment no 7&8	Refer conclusion given in comment no 7 & 8
26. The selection of simple OM based on low cost/must run resources is not adequately justified. Refer B.6.1	26. This selection of simple OM has been established as per the data extracted from CEA database version 4.0, 5.0 and 6.0 and the same had already been demonstrated in the web hosted PDD	Validation team confirms that the emission factor is appropriately calculated and is in accordance with the "Tool to calculate the emission factor for an electricity system" Version 02". Refer section 5b & 5c of the protocol for the detailed validation opinion on the selection of simple OM factor.
27. PP has not provided for each parameter the chosen value or, where relevant, the qualitative	27. Same as Response to point no. 11	Refer section 6c of the protocol for the detailed validation opinion on the input values.

GSC Comment No. 1	Response from PP	Evaluation of response and conclusion
information.		
28. Please Provide the actual value applied. Where time series of data is used, where several measurements are undertaken or where surveys have been conducted, provide detailed information.	28. This comment is not relevant to the project activity as there is no requirement for carrying out sample surveys in the applied approved methodology.	This comment is not relevant to the project activity as there is no requirement for carrying out sample surveys in the applied approved methodology.
Submitted by Lasith		

GSC Comment No. 2	Response from PP	Evaluation of response and conclusion
1. 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 considered at the investment decision. Note that considering cash inflows results in an increase in the IRR	1. The PP has clearly stated in the PDD that it is opting for Generation Based Incentive (GBI) under the MNRE GBI Scheme. As per the scheme regulations, any project opting for the same cannot apply accelerated depreciation and hence there is no question of tax shielding. This comment is not relevant to the project activity under discussion. Hence only relevant assumptions are used in calculation of IRR and same is mentioned in section B.5 of PDD.	As confirmed from the review of MNRE-GBI Scheme Guidelines dated 17/12/2009 ² , "The GBI scheme would be implemented in parallel with existing fiscal incentive including that of accelerated depreciation, for grid connected wind power projects in a mutually exclusive manner, so that companies can avail either accelerated depreciation or GBI, but not both". Accordingly, PP has opted for GBI; this is also verified through their application made to IREDA dated 21/03/2011.

² http://www.cwet.tn.nic.in/Docu/Grid_Interactive_Wind_Power_Projects.pdf

GSC Comment No. 2	Response from PP	Evaluation of response and conclusion
making wind projects a profitable venture.		
2. 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.	2. The third party wind assessment report (carried out by HTC) is dated prior to the decision making and hence was appropriately used for investment analysis. As per para 3 of the "Guidelines for the Reporting and Validation of Plant Load Factor", the PLF can be defined ex-ante by using "The plant load factor determined by a third party contracted by the project participants". The PLF/net generation has been estimated using the third party (HTC) report which has already been shared with the DoE. Further the term loan also has been sanctioned considering the same PLF/net generation. Thus the ex-ante choice of PLF/net generation is justified.	The expected net PLF from the project activity is 23.41% as presented in the Long Term Annual Energy Output Assessment (Third party PLF assessment study) conducted by Hydro Tasmania Consulting. This is inline 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). The third party firm estimated a net PLF of 23.41% and the same is used in the investment analysis. Refer section 6c of the protocol for the detailed validation opinion on the input values.
3. 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?	3. The project activity has considered Equity IRR as the financial indicator and hence Return on Equity (RoE) has been chosen as the appropriate benchmark. There is no specific guidance from the CDM EB on the use of levered or unlevered beta. PP has chosen levered beta for calculating the benchmark. The benchmark is computed in accordance with the latest "Guidelines on the Assessment of Investment Analysis"	Validation team confirms that the Benchmark is appropriately calculated and is in accordance with the latest "Guidelines on the Assessment of Investment Analysis". The PP had selected levered beta for calculating the benchmark. The PP has excluded the beta more than 1.4 and an average of the Beta values of remaining five companies in the power sector has been considered for determining the final Beta value for estimating the return on equity, resulting in a conservative beta value. Refer section 6c of the protocol for the detailed validation opinion on the benchmark. Also refer closure of CAR06
4. Stakeholder consultation: No details provided on which all stakeholders attended the meeting.	4. The web hosted PDD section E.1 clearly describes the category of stakeholders viz. Representatives from technology supplier (Vestas India)	Web hosted PDD clearly describes the date of local stakeholder consultation meeting. The appropriateness of local stakeholder consultation

GSC Comment No. 2	Response from PP	Evaluation of response and conclusion
	- Employees of CLP Wind Farms (India) Private Limited - Villagers from nearby villages The attendance sheet listing names of all the stake holders along with the photographs of the meets were shared with the DoE during validation	meeting conducted by PP is confirmed by the validation team. Refer section 8 of the protocol for the detailed validation opinion on the local stakeholder consultation process.
5. 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. 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 anyone 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 investment decisions really made???	5. The benchmark has been calculated using publicly available information and is representative of a typical benchmark for an investor in a similar project in the country. It is not an internal benchmark. As per the "Tool for demonstration and assessment of Additionality" Version 06, EB 63, the PP is not required to analyze the impact of CDM funds on the project's returns. The PP expects to see an increasing trend in CER prices, and is optimistic that it will be high enough that the project will be able to alleviate the gap between project returns and the benchmark.	Validation team confirms that the Benchmark is appropriately calculated and is in accordance with the latest "Guidelines on the Assessment of Investment Analysis". Refer section 6c of the protocol for the detailed validation opinion on the benchmark. Also refer closure of CAR06
6. Why has the PP considered Reliance Infrastructure Ltd for beta determination when Reliance Infrastructure Ltd. has many other businesses	6. The benchmark is now computed in accordance with the latest "Guidelines on the Assessment of Investment Analysis" refer revised PDD.	Validation team confirms that the Benchmark is appropriately calculated and is in accordance with the latest "Guidelines on the Assessment of Investment Analysis". Refer section 6c of

GSC Comment No. 2	Response from PP	Evaluation of response and conclusion
other than pure power generation? How come the risk profile of Reliance Infrastructure Ltd match with the project activity which involves wind electricity generation?		the protocol for the detailed validation opinion on the benchmark. Also refer closure of CAR06
7. 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? 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??	6. The benchmark is now computed in accordance with the latest "Guidelines on the Assessment of Investment Analysis" refer revised PDD.	Validation team confirms that the Benchmark is appropriately calculated and is in accordance with the latest "Guidelines on the Assessment of Investment Analysis". Refer section 6c of the protocol for the detailed validation opinion on the benchmark. Also refer closure of CAR06
8. Project cost seems to be very high. Are the quotations real or fabricated?	8. The project cost has been estimated based on the offer provided by the technology supplier and other parameters which were available to the PP at the time of decision making. The same can be verified by the DoE during project validation.	Refer section 6c of the protocol for the detailed validation opinion on the input values. Also refer closure of CAR04
9. Are REC benefits being claimed? How will the DOE ensure that the PP does not claim REC benefits during project operation?	9. No. REC benefits were not considered while decision making. PP has signed Power Purchased Agreement with state utility at preferential tariff hence, as per REC regulation in India; the project is not eligible to earn REC benefits.	The validation team confirms that the PP has not considered and is not eligible for REC benefits
10. 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.	10. Tax holiday u/s 80 IA had already been incorporated in the web hosted PDD financials.	The financials have correctly accounted for the tax holidays as per the host country regulations.

GSC Comment No. 2	Response from PP	Evaluation of response and conclusion
Submitted by Babloo		

GSC Comment No. 1	Response from PP	Evaluation of response and conclusion
1. When the project is funded by both equity and loan, the appropriate benchmark would be PROJECT IRR and not EQUITY IRR	1. The Equity component of the project cost represents the money invested in the project by the PP. If the expected returns are not met for this equity investment, the PP has the choice to not make any (equity) investment in the project and this would be the "no project" scenario. If this occurs, there is no question of the debt funding being put in and hence PP had used equity IRR as a benchmark for decision making. Further, as per the Guidelines on the Assessment of Investment Analysis (Version 05, Equity Internal Rate of Return was selected as the financial indicator to assess the attractiveness of the project. The benchmark has been chosen as Return on Equity appropriately.	Validation team confirms the appropriateness of the chosen financial indicator and benchmark in line with latest "Guidelines on the Assessment of Investment Analysis Version 05, EB 62, Annex 5". Also refer closure of CAR04 & CAR06
Submitted by SB		

7.5 Appendix E: Certificate of Appointment

Validation of “Wind Energy Project in Harapanahalli, Karnataka ”

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

Imran Ustad
Shubha Shanbhag
Prabodha C Acharya
Andrew Ritchie

Assigned Roles

Team Leader, Sector Expert
Team Member, Sector Expert
Technical Reviewer, Sector Expert
Decision Maker

Signed by



Andrew Ritchie
Climate Change Services Manager

11th June 2012

Decision Maker

7.6 Appendix F: Validation Protocol and findings log

This document has been produced by the LRQA Validation Team following the completion of the desk review and the site visit. It outlines the validated situation in relation to a number of criteria, including those defined in the Validation and Verification Manual (VVM) produced by the CDM Executive Board.

The questions within this document must be completed in full and in your own words. The purpose of this protocol is to record LRQA's opinion and LRQA's findings.

Where LRQA has identified issues requiring corrective action or clarification, a reference is made in the 'Conclusion' column, and details **are stated in the section marked 'Findings'**.

	Validated situation	Conclusion
SECTION 1. Approval		
Host Country Approval		
1. Has the Host country DNA provided a written approval?	Yes ☒ No ☐ NA ☐ ³ CAR01 was raised to confirm the availability of LoA. The LoA was received on 10/04/2012. After verifying the approval letter the finding was closed.	CAR01 OK
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 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 issued by the DNA. The team confirmed the authenticity of the letter issued.	OK

³For 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).	NA	NA

	Validated situation	Conclusion
10. Does the written Letter of Approval confirm the following: (e) The Party is a Party to the Kyoto Protocol (including ratification)? (f) Participation is voluntary? (g) 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.	Yes ☐ No ☐ NA ☒	NA

		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	CLP Wind Farms (India) Private Limited	OK
		Host Party PP name in PDD/ Annex 1	CLP Wind Farms (India) Private Limited	
		Host Party PP name in MoC	CLP Wind Farms (India) Private 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 ☐ The project activity is currently developed as a unilateral project. Annex I participant is not specified at this stage.		OK
3	Confirm that no entities other than those approved as PPs are included in section A.3 of PDD.	Yes ☒ No ☐ NA ☐ CLP Wind Farms (India) Private Limited is the only PP as indicated in the PDD		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) has been issued by 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 20/02/2011 was submitted by the PP. • CLP Wind Farms (India) Private Limited 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 project design document (CDM-PDD) Version 07 (EB41, Annex 12 and template of CDM-PDD Version 03 (EB25, Annex 15), which are the current versions as applicable and available in UNFCCC website are used.	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.	CLP Wind Farms (India) Private Limited (CLPWFPL) has implemented a wind power project of capacity 39.6 MW comprising of 24 Wind Turbine Generators (WTGs), each with rated capacity of 1650 kW. The project area is spread across 4 villages - Harakanalu, Arsanahalu, Hyarada, Dasanahalli which are part of Harapanahalli Taluk of Davangere District in the State of Karnataka. The electricity generated from the project activity is sold to the local electricity distribution company in the state. The Project activity is contributing towards reduction of the Greenhouse Gas (GHG) emissions by supplying the generated electricity to the Southern Grid, which is mainly dominated by fossil fuel based power. 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, arrangements for O&M 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 technical details with respect of the WTG provided in the PDD were confirmed with technical brochures from Vestas. 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 V-82 of Vestas has been listed by 'Centre for Wind Energy Technology', Govt. of India⁴ confirming availability of type certificate. The expected net PLF from the project activity is 23.41% as presented by the supplier in the offer document. Further to this, the PP also conducted a third party assessment study report for determining PLF in accordance with the Para	OK ~~CAR02-Closed~~

⁴ http://www.cwet.tn.nic.in/html/information_ml.html

	Validated situation	Conclusion																		
	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 firm estimated a net PLF of 23.41%. The bank from where loan is availed has certified that the proponent has applied for a loan based on a PLF of 23.41%. The description of the project activity has been confirmed through the site survey, interview and review of documents. The technical specifications of the project provided in the PDD were confirmed during the site survey and also from the technical specifications provided by the WTG supplier. The PP had also presented approvals for the installation of WTG, commissioning certificates, purchase orders and power purchase agreements (PPAs) (Refer Appendix B of the validation report). The accuracy and completeness of the project description was validated by document review including offer letter from the technology supplier, purchase orders, tariff order, commissioning certificates, PPAs, interview, and field survey.																			
2. Confirm that the exact project location is provided in the PDD with Geographical coordinates and check the accuracy of them. Please include here the Geographical coordinates:	The validation team conducted a 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 WTGs are being provided by Vestas. The details on the location of the project activity WTGs were confirmed as Harakanalu village, Arsanahalu village, Hyarada village and Dasanahalli village, Karnataka, India as given in the section A.4.1.4 of the PDD. The geographic coordinates of the project activity as stated under section A.4.1.4 were confirmed by the validation team. <table border="1"> <thead> <tr> <th>Turbine ID</th><th>Latitude</th><th>Longitude</th></tr> </thead> <tbody> <tr> <td>H15</td><td>14° 48' 20.5"N</td><td>75° 50' 36.5"E</td></tr> <tr> <td>H16</td><td>14° 48' 31.6" N</td><td>75° 50' 25.8"E</td></tr> <tr> <td>H17</td><td>14°48' 42.6" N</td><td>75° 50' 21.2"E</td></tr> <tr> <td>H18</td><td>14° 48' 50.1" N</td><td>75° 50' 24.4"E</td></tr> <tr> <td>H19</td><td>14° 48' 36.9" N</td><td>75° 49' 47.5"E</td></tr> </tbody> </table>	Turbine ID	Latitude	Longitude	H15	14° 48' 20.5"N	75° 50' 36.5"E	H16	14° 48' 31.6" N	75° 50' 25.8"E	H17	14°48' 42.6" N	75° 50' 21.2"E	H18	14° 48' 50.1" N	75° 50' 24.4"E	H19	14° 48' 36.9" N	75° 49' 47.5"E	OK CAR02-Closed
Turbine ID	Latitude	Longitude																		
H15	14° 48' 20.5"N	75° 50' 36.5"E																		
H16	14° 48' 31.6" N	75° 50' 25.8"E																		
H17	14°48' 42.6" N	75° 50' 21.2"E																		
H18	14° 48' 50.1" N	75° 50' 24.4"E																		
H19	14° 48' 36.9" N	75° 49' 47.5"E																		

	Validated situation				Conclusion
	H20	14° 48' 47.8" N	75° 49' 43.2"E		
	H21	14° 49' 07.4" N	75° 49' 42.0"E		
	H22	14° 49' 16.4" N	75° 49' 46.1"E		
	H23	14° 49' 24.1" N	75° 49' 42.5"E		
	H24	14° 49' 19.3" N	75° 49' 22.7"E		
	H25	14° 49' 37.0" N	75° 49' 14.7"E		
	H26	14° 49' 50.4" N	75° 49' 12.6"E		
	H27	14° 49' 43.7" N	75° 48' 50.4"E		
	H28	14° 50' 00.1" N	75° 48' 46.3"E		
	H29	14° 50' 17.2" N	75° 48' 37.5"E		
	H30	14° 50' 26.2" N	75° 48' 44.1"E		
	H31	14° 50' 37.6" N	75° 48' 37.3"E		
	H32	14° 50' 42.2" N	75° 48' 22.1"E		
	H33	14° 50' 50.3" N	75° 48' 17.2"E		
	H34	14° 50' 47.4" N	75° 48' 35.7"E		
	H35	14° 51' 00.5" N	75° 48' 33.2"E		
	H36	14° 51' 13.9" N	75° 48' 08.0"E		
	H37	14° 51' 24.7" N	75° 47' 59.6"E		
	H38	14° 51' 33.0" N	75° 47' 54.5"E		
	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

	Validated situation		Conclusion
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.	The site visit for this project was conducted on 19/05/2011. During the site visit, the validation team visited the project site, local villages and state utilities office.		OK
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	OK
	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. The project proponent has also provided a declaration stating that it has not availed any ODA/public funding for the project.		OK
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.	NA		-

	Validated situation	Conclusion
SECTION 5. Baseline and monitoring methodology		
1. Has the baseline and monitoring methodologies selected by the project participants been previously approved by the CDM Executive Board, i.e. 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 was valid from 17/09/2010 to 10/05/2012. However, projects applying ACM0002 Version 12.3.0 can be submitted for requests for registration until 11 Jan 2013 23:59:59 GMT. The methodology refers to the following methodological tools: • Tool for the demonstration and assessment of additionality • Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion • Tool to calculate the emission factor for an electricity system 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.	NA	-
3. If the project activity is a Small Scale one; which approved small scale methodology does the project apply? Confirm that the SSC meth is applied in conjunction with the general guidelines to SSC CDM methodologies.	NA	-
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 grid-connected electricity generation from renewable sources" Version 12.3.0.	Information in the PDD	Steps taken to assess PDD information	Conclusion
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 meets this requirement as the Project activity involves installation of a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant);	The project involves the installation of new wind power plant/unit. LRQA has confirmed this through the site visit, review of agreements (supply agreement, service & availability, erection and commissioning agreement, development & facilitation agreement) signed between the project participant and the technology provider, and commissioning reports of the WTGs.	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 meets this requirement as the Project activity involves installation of wind power plant.	The project activity involves installation of new power plant at the site (Greenfield project). LRQA has confirmed this through the site visit, review of agreements (supply agreement, service & availability, erection and commissioning agreement, development & facilitation agreement) signed between the project participant and the technology provider, and commissioning reports of the WTGs.	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	Not applicable to the Project activity as the Project is Greenfield setup and does not involve capacity additions, retrofits or replacements.	The project activity involves installation of new power plant at the site (Greenfield project). LRQA has confirmed this through the site visit, review of agreements (supply agreement, service & availability, erection and commissioning agreement, development & facilitation agreement) signed between the project participant and the technology provider, and commissioning reports of the WTGs.	OK

No.	Applicability conditions in the ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” Version 12.3.0.	Information in the PDD	Steps taken to assess PDD information	Conclusion
	project activity;			
4.	In case of hydro power plants: At least one of the following conditions must apply: - The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or - The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of reservoirs is increased and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m² after the implementation of the project activity; or - The project activity results in new single or multiple reservoirs and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m² after the implementation of the project activity.	Not applicable to the project activity since the project activity involves installations of wind power plant.	The project activity is not a hydro power project	OK
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	Not applicable to the Project activity as the Project activity involves installation of a wind power plant.	The project activity is not a hydro power project	OK

No.	Applicability conditions in the ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” Version 12.3.0.	Information in the PDD	Steps taken to assess PDD information	Conclusion
	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/m^2, is lower than 15 MW; • The total installed capacity of the power units, which are driven using water from reservoirs with a power density lower than 4 W/m^2, is less than 10% of the total installed capacity of the project activity from multiple reservoirs.			
5.	The methodology is not applicable to the following: • Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; • Biomass fired power plants; • Hydro power plants that result in new reservoirs or in the increase in existing reservoirs where the power density of the	The project activity is installation of a wind power plant and does not involve- • Switching from fossil fuels to renewable energy sources at the sites. • Biomass fired power plants • Hydro power plants,	The project activity is installation of wind power plants and does not fall in any of the criteria mentioned.	OK

No.	Applicability conditions in the ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" Version 12.3.0.	Information in the PDD	Steps taken to assess PDD information	Conclusion
	power plant is less than 4 W/m ² .			
Applicability condition of "Tool to calculate the emission factor for an electricity system"				
	<i>The geographic and system boundaries for the relevant electricity grid can be clearly identified and information on the characteristics of the grid is available.</i>	Applicable The geographic and system boundaries of the project connected electricity grid (the Southern 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 as 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.	NA	-
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.	NA	-

	Validated situation	Conclusion
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).	

	Validated situation	Conclusion
SECTION 5a. Project boundary		
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:	All sources and GHGs required by the methodology have been included within the project boundary.	OK

	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 the identified baseline scenario which would have been undertaken in absence of the proposed project activity and in line 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
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, i.e. 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

	Validated situation	Conclusion
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
NA			NA
NA			NA

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.	NA

	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 ACM0002 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/yr) $EF_{grid, CM, y}$ = 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. <u>Calculation of $EG_{PJ,y}$</u> Since the project activity is the installation of a new grid-connected renewable power 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. <u>Calculation of the emission factor ($EF_{grid, CM, y}$)</u>	OK

	Validated situation	Conclusion
	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 (hereinafter referred to as "the tool"), in accordance with the applied methodology. The PP uses the EF for the grid electricity as calculated in CO₂ Baseline Database for the Indian Power Sector published by the Central Electricity Authority (CEA), Ministry of Power, 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 CM EF is provided as below: Step 1 of the <i>tool</i> 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 Southern region, the selection of the Southern Grid for the purpose of estimation of baseline emission factor is considered appropriate. Therefore, the validation team confirmed the applicability of Step 1 of the <i>tool</i>. Step 2 of the <i>tool</i> 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 <i>tool</i> requires selection of a method for estimation of operating margin. Of the four methods provided in the <i>tool</i> 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	

	Validated situation	Conclusion																				
	most recent years, i.e from 2005-06 to 2009-10. <table><tr><th>Year</th><th>Low-cost/must-run resources of net generation</th></tr><tr><td>2005-06</td><td>27.00%</td></tr><tr><td>2006-07</td><td>28.30%</td></tr><tr><td>2007-08</td><td>27.10%</td></tr><tr><td>2008-09</td><td>22.80%</td></tr><tr><td>2009-10</td><td>20.60%</td></tr></table> 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 <i>tool</i> requires the calculation of the operating margin emission factor according to the Simple OM method chosen as per Step 3 above. In validating Step 3, LRQA confirmed the calculations with respect to the OM emission factor for the Southern Grid and arrived at the following summary: <table><tr><th>Year</th><th>Absolute emissions (including imports) (tCO₂)</th><th>Net generation (including imports) (GWh)</th><th>Specific emissions (tCO₂/MWh)</th></tr><tr><td>2009-10</td><td>127,831,832</td><td>135,774</td><td>0.9415</td></tr></table> EF_{gridOM}= 0.9415 tCO₂/MWh Step 5: Identification of the group of power units to be included in the Build Margin	Year	Low-cost/must-run resources of net generation	2005-06	27.00%	2006-07	28.30%	2007-08	27.10%	2008-09	22.80%	2009-10	20.60%	Year	Absolute emissions (including imports) (tCO ₂)	Net generation (including imports) (GWh)	Specific emissions (tCO ₂ /MWh)	2009-10	127,831,832	135,774	0.9415	
Year	Low-cost/must-run resources of net generation																					
2005-06	27.00%																					
2006-07	28.30%																					
2007-08	27.10%																					
2008-09	22.80%																					
2009-10	20.60%																					
Year	Absolute emissions (including imports) (tCO ₂)	Net generation (including imports) (GWh)	Specific emissions (tCO ₂ /MWh)																			
2009-10	127,831,832	135,774	0.9415																			

	Validated situation	Conclusion								
	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 CO₂ Baseline 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 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’ Step 6 of the <i>tool</i> requires calculation of the build margin emission factor. The CEA database provides a BM value for the Southern grid as 0.7634. As part of validation of Step 5 of the tool, LRQA confirmed the BM for the year 2009-10 as per the following summary: <table><tr><th>Year</th><th>Absolute emissions (tCO₂)</th><th>Net Generation (GWh)</th><th>Specific emissions (tCO₂/MWh) BM</th></tr><tr><td>2009-10</td><td>27,558,555</td><td>36,100</td><td>0.7634</td></tr></table> Step 7 of the <i>tool</i> 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.	Year	Absolute emissions (tCO ₂)	Net Generation (GWh)	Specific emissions (tCO ₂ /MWh) BM	2009-10	27,558,555	36,100	0.7634	
Year	Absolute emissions (tCO ₂)	Net Generation (GWh)	Specific emissions (tCO ₂ /MWh) BM							
2009-10	27,558,555	36,100	0.7634							

	Validated situation	Conclusion
	The baseline grid emission factor has been calculated as; $EF_{CO_2, grid, y} = EF_{grid, CM, y} = 0.8970 \text{ tCO}_2/\text{MWh}$ The baseline emissions thus can be estimated as: $BE_y = EG_{BL, y} \times EF_{CO_2, grid, y}$ $= 81,200 \text{ MWh} \times 0.8970 \text{ tCO}_2\text{e}/\text{MWh}$ $= 72,834 \text{ tCO}_2\text{e}$ Annual average baseline emission is estimated to be 72,834 tCO₂e. Ex-ante electricity generation has been evaluated based on 'Guidelines for the reporting and validation of plant load factors' Version 01, Annex 11, CDM EB report of its 48th meeting. <u>Project emissions (PE_y)</u> According to the chosen baseline methodology ACM0002, for wind energy based renewable energy project activities, PE_y = 0 <u>Leakage (LE_y)</u> No leakage emissions are considered.as per the methodology Hence, LE_y = 0 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 (tCO₂e/y)	

	Validated situation	Conclusion																														
	BE_y: Baseline emissions in the year y (tCO₂e/y) PE_y: Project emissions in the year y (tCO₂e/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 = 72,834 - 0 = 72,834 tCO₂e																															
2. Verify the justification given in the PDD for the choice of data and parameters used in the equations to determine estimated emission reductions. 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.	<table><tr><th>Data/Parameter title:</th><th>W_{OM}</th></tr><tr><td>Title in line with methodology?</td><td>Yes, In line with “Tool “</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><tr><td>Appropriate description of parameter?</td><td>Yes Weightage of operating margin emissions factor</td></tr><tr><td>Source clearly referenced?</td><td>Yes Default values used as per the “Tool to calculate the emission factor for an electricity system” Version 2</td></tr><tr><td>Value provided is considered reasonable?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Choice of data correctly justified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr></table> <table><tr><th>Data/Parameter title:</th><th>W_{BM}</th></tr><tr><td>Title in line with methodology?</td><td>Yes, In line with “Tool “</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><tr><td>Appropriate description of parameter?</td><td>Yes Weightage of build margin</td></tr></table>	Data/Parameter title:	W _{OM}	Title in line with methodology?	Yes, In line with “Tool “	Fixed throughout the crediting period?	Yes	Data unit correctly expressed?	Yes (%)	Appropriate description of parameter?	Yes Weightage of operating margin emissions factor	Source clearly referenced?	Yes Default values used as per the “Tool to calculate the emission factor for an electricity system” Version 2	Value provided is considered reasonable?	Yes	Has this value been verified?	Yes	Choice of data correctly justified?	Yes	Measurement method correctly described?	NA	Data/Parameter title:	W _{BM}	Title in line with methodology?	Yes, In line with “Tool “	Fixed throughout the crediting period?	Yes	Data unit correctly expressed?	Yes (%)	Appropriate description of parameter?	Yes Weightage of build margin	OK
Data/Parameter title:	W _{OM}																															
Title in line with methodology?	Yes, In line with “Tool “																															
Fixed throughout the crediting period?	Yes																															
Data unit correctly expressed?	Yes (%)																															
Appropriate description of parameter?	Yes Weightage of operating margin emissions factor																															
Source clearly referenced?	Yes Default values used as per the “Tool to calculate the emission factor for an electricity system” Version 2																															
Value provided is considered reasonable?	Yes																															
Has this value been verified?	Yes																															
Choice of data correctly justified?	Yes																															
Measurement method correctly described?	NA																															
Data/Parameter title:	W _{BM}																															
Title in line with methodology?	Yes, In line with “Tool “																															
Fixed throughout the crediting period?	Yes																															
Data unit correctly expressed?	Yes (%)																															
Appropriate description of parameter?	Yes Weightage of build margin																															

	Validated situation		Conclusion
		emissions factor	
	Source clearly referenced?	Yes Default values used as per the “Tool to calculate the emission factor for an electricity system” Version 2	
	Value provided is considered reasonable?	Yes	
	Has this value been verified?	Yes	
	Choice of data correctly justified?	Yes	
	Measurement method correctly described?	NA	
	Data/Parameter title:	EG_{facility,y}	
	Title in line with methodology?	Yes	
	Fixed throughout the crediting period?	No	
	Data unit correctly expressed?	Yes (MWh/year)	
	Appropriate description of parameter?	Yes	
	Source clearly referenced?	Yes	
	Value provided is considered reasonable?	Yes (81,200)	
	Has this value been verified?	Yes	
	Choice of data correctly justified?	Yes	
	Measurement method correctly described?	Yes	
	Data/Parameter title:	EF_{grid CM,y}	
	Title in line with methodology?	Yes, in line with applied “Tool“	
	Fixed throughout the crediting period?	No. To be monitored ex-post	
	Data unit correctly expressed?	Yes (tCO ₂ /MWh)	
	Appropriate description of parameter?	Yes	
	Source clearly referenced?		

Validated situation		Conclusion
	the CO ₂ baseline database for the Indian Power Sector published by CEA (http://cea.nic.in/reports/planning/cdm_CO2/cdm_CO2.htm)	
Value provided is considered reasonable?	Yes	
Has this value been verified?	Yes	
Choice of data correctly justified?	Yes	
Measurement method correctly described?	NA	
Data/Parameter title:	EF_{grid,OM,y}	
Title in line with methodology?	Yes, in line with applied "Tool"	
Fixed throughout the crediting period?	No. To be monitored ex-post	
Data unit correctly expressed?	Yes (tCO ₂ /MWh)	
Appropriate description of parameter?	Yes	
Source clearly referenced?	Yes as per Latest version of the CO ₂ baseline database for the Indian Power Sector published by CEA (http://cea.nic.in/reports/planning/cdm_CO2/cdm_CO2.htm)	
Value provided is considered reasonable?	Yes	
Has this value been verified?	Yes	
Choice of data correctly justified?	Yes	
Measurement method correctly described?	NA	
Data/Parameter title:	EF_{grid,BM,y}	

	Validated situation		Conclusion
	Title in line with methodology?	Yes, in line with applied "Tool"	
	Fixed throughout the crediting period?	No. To be monitored ex-post	
	Data unit correctly expressed?	Yes (tCO ₂ /MWh)	
	Appropriate description of parameter?	Yes	
	Source clearly referenced?	Yes as per Latest version of the CO ₂ baseline database for the Indian Power Sector published by CEA (http://cea.nic.in/reports/planning/cdm_CO2/cdm_CO2.htm)	
	Value provided is considered reasonable?	Yes	
	Has this value been verified?	Yes	
	Choice of data correctly justified?	Yes	
	Measurement method correctly described?	NA	
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.	All assumptions and data used by the PP have been 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.	The 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		

	Validated situation	Conclusion
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	<i>"Tool for demonstration and assessment of Additionality"</i> 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 it is in line with the Glossary of CDM Terms?	Yes ☒ No ☐ The start date of the project has been considered as 13/08/2010 i.e. the date of signing of agreement with technology supplier, i.e Vestas Wind Technology India Private Limited. LRQA has validated the start date in accordance with Glossary of CDM Terms version 05, through the review of agreement with technology supplier for WTG, commissioning certificates, and power purchase agreements.	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 17/08/2010, on their intention to seek CDM status. The validation team has reviewed the copy of the prior consideration form that has been sent to the UNFCCC and from list of notifications received by the UNFCCC from the UNFCCC website. Also, the notification to host party DNA was confirmed from the email communication dated 17/08/2010. 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. However, CAR 03 was raised as the dates for all the events under the table ‘chronology of events’ were not stated. The PP revised the PDD, mentioning the dates for all the events. The validation team confirmed the dates with the evidence and closed the CAR.	~~CAR03~~ OK

	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	NA

	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
	1	The proposed Project activity not undertaken as a CDM project activity. The financial unattractiveness of the project activity not undertaken as a CDM project activity is demonstrated through investment barrier by applying the benchmark analysis. The validation team has validated the investment analysis in the below sections.
	2	No Project activity and equivalent amount of energy would have been produced by the Project grid electricity system through its currently running power plants and by new capacity addition to the grid i.e. Continuation of current situation. This is a credible alternative as in absence of the project activity, the grid would have continued with the fossil fuel based power projects and thus there would also be the associated GHG emissions. Thus, continuation of the current situation (electricity generation from the grid) is the most probable baseline alternative for the project.
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.		
		OK

	Validated situation	Conclusion
SECTION 6c. Investment analysis		
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.	The PP has demonstrated additionality by applying the investment barrier in accordance with the “<i>Tool for demonstration and assessment of Additionality</i>” 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 table below.	OK ~~CAR04 Closed~~ ~~CAR06 Closed~~
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. Equity IRR was calculated 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 calculation considers benefit under section 80 IA⁵ of the Income Tax Act under which such projects are entitled for tax holiday for 10 consecutive years out of the first 15 years. 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.	OK

⁵ Section 80 IA – 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.

	Validated situation	Conclusion																				
	The PP had presented the unprotected spreadsheet versions of all investment analysis, having readable formulae. LRQA can 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 project IRR calculated with the input parameters as provided below work out to 7.54% for the project activity without considering the benefits from the CDM revenue which is less than the benchmark of 19.40%.																					
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.	Parameters (i) annual generation, (ii) power sale tariff, (iii) O&M cost and (iv) project cost were selected for sensitivity analysis. The validation team confirms the sensitivity analysis as below: <table><tr><th>Parameter</th><th>Variation (+10%)</th><th>Variation (-10%)</th><th>Cross Over Point</th></tr><tr><td>Change in net generation</td><td>10.54%</td><td>3.76%</td><td>+39.26%</td></tr><tr><td>Change in Power Sale tariff</td><td>10.49%</td><td>3.78%</td><td>+ 40.48%</td></tr><tr><td>Change in O&M Cost</td><td>7.06%</td><td>8.00%</td><td>-370.8%</td></tr><tr><td>Change in Total Project Cost</td><td>4.68%</td><td>10.55%</td><td>-29.32%</td></tr></table> <u>Annual generation:</u> The PP has appointed a third party consultant for assessment of the PLF for the WTG	Parameter	Variation (+10%)	Variation (-10%)	Cross Over Point	Change in net generation	10.54%	3.76%	+39.26%	Change in Power Sale tariff	10.49%	3.78%	+ 40.48%	Change in O&M Cost	7.06%	8.00%	-370.8%	Change in Total Project Cost	4.68%	10.55%	-29.32%	OK
Parameter	Variation (+10%)	Variation (-10%)	Cross Over Point																			
Change in net generation	10.54%	3.76%	+39.26%																			
Change in Power Sale tariff	10.49%	3.78%	+ 40.48%																			
Change in O&M Cost	7.06%	8.00%	-370.8%																			
Change in Total Project Cost	4.68%	10.55%	-29.32%																			

	Validated situation	Conclusion																										
	location. Since the PP has considered the PLF as per the PLF assessment report, which is site specific, the considered value is more appropriate and very unlikely to increase. The IRR does not cross the benchmark if the annual electricity generation / PLF is increased by +10%. The IRR crosses the benchmark with a variation in PLF of 39.26% i.e. at the PLF value of 32.60%. LRQA reviewed the tariff order of the Karnataka Electricity Regulatory Commission dated 11/12/2009, which was applicable at the time of investment decision, which indicates a PLF of 26.5% for Karnataka. <u>Tariff rate:</u> As the KERC order dated 11/12/2009 has fixed the tariff for the period of 10 years there is no possibility of change in tariff. The electricity tariff for the project is fixed at of INR 3.70/kWh as confirmed from the actual power purchase agreement (PPA). Tariff rate in India has been under government control. Though government varies tariff rates in accordance with the market conditions or other incentives as per national priorities, increasing the rate by 40.48% after the PPA is signed is very unlikely. In the KERC tariff order, the tariff rate has been estimated as an average of 10 year tariff rate as provided below: <table><tr><th>Year</th><th>Tariff (INR/ kWh)</th></tr><tr><td>1st Year</td><td>4.40</td></tr><tr><td>2nd Year</td><td>4.25</td></tr><tr><td>3rd Year</td><td>4.10</td></tr><tr><td>4th Year</td><td>3.94</td></tr><tr><td>5th Year</td><td>3.79</td></tr><tr><td>6th Year</td><td>3.64</td></tr><tr><td>7th Year</td><td>3.49</td></tr><tr><td>8th Year</td><td>3.34</td></tr><tr><td>9th Year</td><td>3.19</td></tr><tr><td>10th Year</td><td>3.04</td></tr><tr><td>Average Tariff for the above 10 years</td><td>3.72</td></tr><tr><td>Rounded off to</td><td>3.70</td></tr></table>	Year	Tariff (INR/ kWh)	1 st Year	4.40	2 nd Year	4.25	3 rd Year	4.10	4 th Year	3.94	5 th Year	3.79	6 th Year	3.64	7 th Year	3.49	8 th Year	3.34	9 th Year	3.19	10 th Year	3.04	Average Tariff for the above 10 years	3.72	Rounded off to	3.70	
Year	Tariff (INR/ kWh)																											
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10 th Year	3.04																											
Average Tariff for the above 10 years	3.72																											
Rounded off to	3.70																											
	Further, even if the tariff, which has been fixed at INR 3.70/kWh for first 10 years of operation,																											

	Validated situation	Conclusion
	is increased by 10% for all 20 years, the project still remains additional. <u>O&M cost:</u> The IRR does not cross the bench mark even when the O&M cost is made zero. A decrease in O&M cost to zero is not feasible considering the high inflation rate in the host country. <u>Project cost</u> The IRR is within the benchmark of 19.40% for a reasonable variation of -10% of the project cost as provided in the table above. As the project activity is operational and the costs have already been incurred by the project participant, LRQA reviewed the purchase orders issued by the PP to confirm the actual project cost. The actual cost for project is INR 2315.073 million and falls within the sensitivity range considered. The project IRR reaches the benchmark at a variation by -29.32%, which is unlikely to happen since the project is already in operation. LRQA confirmed that the result of the sensitivity analysis consistently supports the conclusion that the project activity is not financially attractive. Based on the validation of the investment analysis that included an assessment of all parameters and assumptions used in calculating the relevant financial indicator, cross-checks against third party or publicly available sources and correctness of computation carried out, the financial returns of the proposed CDM project activity would be insufficient to justify the required investment.	

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
No. of wind turbines	Nos	24	Vestas Proposal	The number of WTGs involved in the project has been confirmed based on the review of proposal, agreements (supply agreement, service & availability, erection and commissioning agreement, development & facilitation agreement) signed by PP with technology supplier and Commissioning Reports of the WTGs. (Refer Section 7.2 Appendix B of the report for the list of documents reviewed by the validation team). This was also confirmed during the site visit.	OK
Capacity of each wind turbine	MW	1.65			
Capacity of the project	MW	39.6			
Net Generation	Million units	81.20	Third party Assessment Report, page 69, Table 7.5 Calculated	The Net Annual Estimated Generation and PLF are sourced from the Long Term Annual Energy Output Estimate (LTAE0) Report by third party i.e. Hydro Tasmania Consulting contracted by the PP before the investment decision. The PLF was sourced from the third party report of Hydro Tasmania Consulting dated 16/06/2010 and is in accordance with Option 3 b) of the "Guidelines on Reporting and Validation of Plant Load Factors" Version 01. It was confirmed by the validation team that the third party report was available to PP during the investment decision. During the site visit by the validation team to the PP's corporate office, the PP confirmed that the PLF values for WTGs were sourced from the third party report rather than only relying on the values provided by the technology suppliers in their offer letters. The third party PLF values are more realistic, since the values are determined after application of loss factors. The losses as mentioned below were reviewed by the validation team to form the energy estimate report and found to be appropriate.	OK ~~CAR04 Closed~~
Plant Load Factor	%	23.41			

Parameter/input	Symbol/Unit	Value	Source	Means of validation	Conclusion																																							
				<table><tr><td></td><td>Losses</td><td></td></tr><tr><td>A</td><td>WAsP Model Correction (Terrain effects)</td><td>100%</td></tr><tr><td>B</td><td>Internal wake effects</td><td>96.7%</td></tr><tr><td>C</td><td>Other wake effects (existing and future wind farms)</td><td>100%</td></tr><tr><td>D</td><td>Power curve performance</td><td>96%</td></tr><tr><td>E</td><td>WTG availability</td><td>96.5%</td></tr><tr><td>F</td><td>Electrical connection availability</td><td>98%</td></tr><tr><td>G</td><td>Other Environmental Effects (Blade degradation)</td><td>99.5%</td></tr><tr><td>H</td><td>Curtailment</td><td>100%</td></tr><tr><td>I</td><td>WTG Transformer</td><td>98.5%</td></tr><tr><td>J</td><td>Wind Farm Power Collection System</td><td>98.5%</td></tr><tr><td>K</td><td>Wind Farm Substation Transformer</td><td>99.5%</td></tr><tr><td>L</td><td>Transmission Line</td><td>NA</td></tr></table> Further to confirm the appropriateness of the PLF assumed, the validation team has reviewed the following: • In addition, validation team also compared the PLF with similar registered projects (UNFCCC Ref: 4956, 4739, 4997, 3575, 3735, 3700) located in Karnataka state where PLF varies from 23.18% to 26.50%. • This is also compared with the PLF of 26.5% as specified in the KERC Order dated 11/12/2009 which mentions a PLF of 26.5%. However, the PLF as indicated in the KERC tariff order is applicable to larger region and not site specific. At this PLF of 26.50%, the project IRR (without CDM revenues) is 11.46%, which still less than the benchmark. Hence the values were accepted by the validation team.		Losses		A	WAsP Model Correction (Terrain effects)	100%	B	Internal wake effects	96.7%	C	Other wake effects (existing and future wind farms)	100%	D	Power curve performance	96%	E	WTG availability	96.5%	F	Electrical connection availability	98%	G	Other Environmental Effects (Blade degradation)	99.5%	H	Curtailment	100%	I	WTG Transformer	98.5%	J	Wind Farm Power Collection System	98.5%	K	Wind Farm Substation Transformer	99.5%	L	Transmission Line	NA	
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L	Transmission Line	NA																																										
Project Cost	INR Million	2316.00	Vestas Proposal and	The project cost is sourced from the “Non binding project proposal	OK																																							

Parameter/input	Symbol/Unit	Value	Source	Means of validation	Conclusion
			other supporting documents	for setting up 39.6 MW wind farm submitted by Vestas Wind Technology India Private Limited to PP" dated 12/03/2010. The actual project cost as confirmed from the agreements signed by the PP (details provided in Appendix B, section 7.2) is INR 2315.073 Million. In addition, the validation team cross-checked the project cost with the loan sanction letter dated 08/12/2010 which mentions the EPC cost for project as INR 2316 million. The project cost is dependent on the prevailing economic and market conditions and therefore dependent upon the time of investment decision and prevailing economic policies of the state. From the review of similar registered projects (UNFCCC Ref: 4956, 4739, 4997, 3575, 3735, 3700) it was noted that cost per unit capacity varies from INR 49.20 to 62.67 Millions/MW, and the unit cost of the project activity is INR 58.48 Millions/MW. Hence the project cost as mentioned in the financial offer document is considered reasonable and hence accepted.	~~CAR04 Closed~~
Debt Equity	%	70% 30%	As per CLP Group's earlier project	This is also compared with the D/E ratio of 70:30 as specified the KERC Order dated 11/12/2009 and found to be appropriate. This is also compared with similar projects in region and found to be acceptable.	OK ~~CAR04 Closed~~
Interest rate	%	11.25%	As per CLP Group's earlier project	This is also compared with the interest rate of 11.75% as specified the KERC Order dated 11/12/2009 and found to be appropriate. This is compared with Letter of Intent from CLP Wind Farms (India) Pvt Ltd to IDFC dated 08/12/2010 which specifies the interest rate as 11.26% and hence the value assumed by the PP is acceptable.	OK ~~CAR04 Closed~~
Debt tenure	years	12	As per CLP Group's earlier project	This is compared with Letter of Intent from CLP Wind Farms (India) Pvt Ltd to IDFC dated 08/12/2010 which specifies the interest rate as 11.26% and hence the value assumed by PP is	OK ~~CAR04 Closed~~

Parameter/input	Symbol/Unit	Value	Source	Means of validation	Conclusion
				acceptable.	
Moratorium	years	0	As per CLP Group's earlier project	This is compared with Letter of Intent from CLP Wind Farms (India) Pvt Ltd to IDFC dated 08/12/2010 which specifies the interest rate as 11.26% and hence the value assumed by PP is acceptable.	OK ~~CAR04 Closed~~
Operation and Maintenance (first 3 years)	INR Million	0	Vestas proposal	The O&M cost is confirmed from the "Non binding project proposal for setting up 39.6 MW wind farm submitted by Vestas Wind Technology India Private Limited to PP" dated 12/03/2010 and found to be acceptable.	OK ~~CAR04 Closed~~
Operation and Maintenance (4th year)	INR Million	40.80	Vestas proposal	The O&M cost is confirmed from the "Non binding project proposal for setting up 39.6 MW wind farm submitted by Vestas Wind Technology India Private Limited to PP" dated 12/03/2010. KERC Order dated 11/12/2009 stipulates the same as 1.25% of capital cost. The O&M cost is dependent on the prevailing economic and market conditions and therefore dependent upon the time of investment decision and prevailing economic policies of the state. From the review of similar registered projects (UNFCCC Ref: 4956, 4739, 4997, 3575, 3735, 3700) it was noted that the O&M cost was found to be 1.05%-1.74% of the project cost. In the current project O&M cost is 1.74% and falls in the range of O&M cost of other similar projects. Hence the validation confirms that O&M charges are appropriate.	OK ~~CAR04 Closed~~
Escalation in O & M (5 to 20)	%	5	Vestas proposal	This is also compared with the O&M escalation rate of 5% as specified the KERC Order dated 11/12/2009 and found to be appropriate.	OK ~~CAR04 Closed~~
Service tax on O & M fees	%	10.30	As per prevalent service tax rates	The PP has considered the service tax based on the host country regulation applicable at the time of investment decision making. Hence, the service tax considered for the project is deemed appropriate.	OK ~~CAR04 Closed~~
Insurance cost per turbine	INR Million	0.07227	As per quotation received from insurance brokers	Confirmed from the mail from the insurance provider giving the details of the insurance premium (covering fire insurance, earth quake and terrorism extensions and general insurance) assumed for the project dated 14/06/2010	OK ~~CAR04 Closed~~
Insurance cost for	INR Million	1.73	As per quotation	Confirmed from the mail from the insurance provider giving the	OK

Parameter/input	Symbol/Unit	Value	Source	Means of validation	Conclusion
the project			received from insurance brokers	details of the insurance premium (covering fire insurance, earth quake and terrorism extensions and general insurance) assumed for the project dated 14/06/2010	~~CAR04-Closed~~
Tariff	INR/kWh	3.70	Karnataka Electricity Regulatory Commission (KERC)'s tariff order for non-conventional energy dated December 2009	The validation team confirmed the tariff rate of 3.70 INR/kWh without any escalation as specified the KERC Order dated 11/12/2009 and applicable at the time of investment decision making. The tariff is also confirmed through review of Power Purchase agreement between BESCOM and M/s CLP Wind farms India Private Ltd dated 28/12/2010. Tariff rate is dependent on the local government policies; any change to the tariffs is only applicable to projects wherein the PPA has not been entered into. Since the PPA for this project activity is already in place, any change in the tariffs through the tariff policy will not affect this project activity. The PP has considered a fixed tariff rate of INR 3.70/kWh for the period of 10 years. LRQA reviewed the tariff order dated 11/12/2009 which calculates the tariff rate for each year with 1st year tariff rate as INR 4.40/kWh, gradually decreasing to INR 3.04/kWh in 10th year. KERC has determined a simple average tariff rate of INR 3.70/kWh as fixed for 10 years. Though the tariff order does not specify the tariff rate from 11th year onwards, it is very likely that the tariff rate will be reduced from 11th year as the PP shall service its debt and interests on it before 10 years of WTG operation. Hence, LRQA deems a constant tariff rate of INR 3.70/kWh for the financial analysis to be reasonable.	OK ~~CAR04-Closed~~
Depreciation Rate (Book)	%	5.28	Indian Companies Act	In accordance with the local taxation laws.	OK ~~CAR04-Closed~~
IT Depreciation Rate	%	7.69	Appendix IA of Income Tax (IT) Rules	In accordance with the local taxation laws.	OK ~~CAR04-Closed~~
Generation Based Incentive (GBI)	INR/kWh	0.5	Ministry of New and Renewable Energy	Confirmed from GBI Scheme announced by MNRE dated 17/12/2009. It was confirmed during the meeting held at the PP's	OK ~~CAR04-Closed~~

Parameter/input	Symbol/Unit	Value	Source	Means of validation	Conclusion
			(MNRE)'s Generation Based Incentive (GBI) scheme/ Indian Renewable Energy Development Agency (IREDA)	office that the GBI scheme was available during the decision making of the project and the PP had considered GBI during investment decision of the project. GBI Application letter to IREDA from CLPWFPL dated 21/03/2011 was also reviewed to confirm the above.	
GBI cumulative cap	INR Million per MW	6.20	MNRE GBI scheme/ IREDA	Confirmed from GBI Scheme announced by MNRE dated 17/12/2009	OK
Max. GBI allowed in a year	INR Million per MW	1.55	MNRE GBI scheme/ IREDA	Confirmed from GBI Scheme announced by MNRE dated 17/12/2009	OK
Max. GBI allowed in a year	INR Million	61.38	MNRE GBI scheme/ IREDA	Confirmed from GBI Scheme announced by MNRE dated 17/12/2009	OK
GBI cumulative cap	INR Million	245.52	MNRE GBI scheme/ IREDA	Confirmed from GBI Scheme announced by MNRE dated 17/12/2009	OK
Max duration for GBI	years	10	MNRE GBI scheme/ IREDA	Confirmed from GBI Scheme announced by MNRE dated 17/12/2009	OK
Income tax rate	%	33.22	IT rate	In accordance with the local taxation laws.	OK
MAT rate	%	19.93	Finance Bill 2010	In accordance with the local taxation laws.	OK
Salvage Value	%	5	Assumed	As per sub section 2(b) of section 205 of the Companies Act 1956 Assets can be depreciated up to 95%, hence residual value is considered as 5%. It can be referred on http://www.indiankanoon.org/doc/1422372/ .	OK CAR04

	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 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.	Appropriateness of the benchmark The benchmark applied for the project activity is expected returns on equity which is calculated based on Capital Asset Pricing Model (CAPM) approach. CAPM is a model based on the proposition that any stock's required rate of return is equal to the risk-free rate of return plus a risk premium that reflects only the risk remaining after diversification. The benchmark based on the Capital Asset Pricing Model (CAPM) method is calculated with the help of the following formula: $R_e = R_f + \beta \times (R_m - R_f)$ Where, R_f - Risk free rate of return R_m - Expected market returns β - Beta $(R_m - R_f)$ - Market risk premium As per the guidance 13 of the 'Guidelines on the assessment of investment analysis' Version 05, for cases where projects could be developed by an entity other than the project participant, the benchmark should be based on parameters that are standard in the market and the DOE shall also include its opinion on whether a benchmark based on parameters that are standard in the market is suitable in the context of the underlying project activity.	OK CAR06-Closed

⁶ http://rbidocs.rbi.org.in/rdocs/Bulletin/DOCs/26CT_CBL080510.xls

⁷ Period since inception of BSE 500 index (February 1999) has been considered

⁸ <http://www.bseindia.com/about/abindices/bse500.asp>

⁹ <http://pages.stern.nyu.edu/~adamodar/pdfiles/papers/ERPfull.pdf>

¹⁰ <http://www.bseindia.com/histdata/hindices.asp>

¹¹ Total Risk = Systematic risk + Unsystematic risk

¹² <http://tfsfrd.tamu.edu/tdss/Basic/rateCalc.asp>

	Validated situation	Conclusion
	Accordingly, LRQA validated the below components of CAPM: i) Risk Free Rate of Return (R_f), ii) Beta (Average) arrived from the similar power generating companies (β) iii) Expected Market Returns (R_m). The PP has calculated the equity benchmark (required/expected return on equity) by adding a risk premium over government bond rates based on the publicly available stock market data. The benchmark based on CAPM has been compared with equity IRR (chosen financial indicator) which is in accordance with the guidance 12 of the “Guidelines on the assessment of investment analysis” Version 05. <u>Risk free rate of return (R_f):</u> 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 the 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. LRQA confirmed that the returns on Central Government securities as verified from the official website of the Reserve Bank of India⁶ which was 8.2307% per annum, available at the time of investment decision. The value considered for the risk free rate of return is for 20 years maturity. Therefore, this is considered appropriate. <u>Expected market returns (R_m):</u> The expected rate of return of market portfolio has been calculated by the PP based on the compounded annual growth rate (CAGR) of publicly available BSE-500 Index data for a period of 11.41 years from February 1999 – 30/06/2010⁷. The Bombay Stock Exchange Limited constructed an index, christened BSE-500, consisting of 500 scripts. The changing pattern of the economy and that of the market were kept in mind while constructing this index. BSE-500 Index is a broad-based Index consisting of 500 companies across 20 sectors listed at the Exchange, representing approximately 93% of the total market capitalisation on BSE and covers all 20 major industries of the economy⁸. This is the most diversified index of the entire stock indices portfolio at the BSE. BSE-500 Index is scientifically calculated and the 500 companies are selected based on market capitalisation, liquidity and balanced industry representation. The BSE-500 index 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.	

	Validated situation	Conclusion
	As the BSE-500 index represents a widely diversified portfolio in terms of quantum of companies, the selection of the same for the calculation of R_m used in CAPM was deemed to be appropriate The BSE-500 index started in February 1999. This index has vintage data available since February 1999 (inception date). The PP has considered the BSE-500 index data from February 1999 (period of inception) to 30/06/2010 (prior to investment decision date), which amounts to 11.41 years. As per “Equity Risk Premiums (ERP): Determinants, Estimation and Implications”, by Aswath Damodaran⁹, the use of vintage data for 10 years and above is considered an acceptable practice. Hence, it was concluded that the calculation of expected market returns using data for a period of 11.41 years is appropriate. 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: $\text{CAGR} = (\text{index value at end} / \text{index value at beginning})^{(1 / \text{no. of years})} - 1$ LRQA verified the values considered for calculating the CAGR from publicly available information¹⁰ and confirms the calculation for market rate of return from the data available during the investment decision as 18.72% Beta (β) The CAPM assumes that investors hold fully diversified portfolios. This means that investors are assumed by the CAPM to want a return on an investment based on its systematic risk alone, rather than on its total risk¹¹. The measure of risk used in the CAPM, which is called ‘Beta’, is therefore a measure of systematic risk. Hence, Beta is the measure of the risk of a specific sector/company. In order to quantify the risk related to this project, the PP had taken the Beta values of the nine similar power generating companies listed on the BSE website. The Beta value of the nine similar power generating companies ranges from 0.6133 to 2.2370. The PP has excluded the beta more than 1.4 and an average of the Beta values of remaining five companies in the power sector has been considered for determining the final Beta value for estimating the return on equity. The exclusion of beta more than 1.4 results in a lower average beta value	

	Validated situation	Conclusion
	which is conservative. The 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 School of Business”. by Aswath Damodaran states the following: <i>“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”.</i> Hence the validation team is of the opinion that consideration of 5 year data (July 2005 –June 2010) for beta estimation by the PP is well within the host country accounting practices and hence appropriate. Further, 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 values of the nine similar power generating companies has been calculated based on the standard method β = Covariance of returns of the similar power generating companies with the market / Variance on the market The Beta value is calculated based on the above method for the similar power generating companies. The average beta of the five companies (excluding the companies for which beta is more than 1.4) is calculated as 1.0642. Thus, the benchmark value of 19.40% calculated for the project activity as considered by the PP at the time of investment decision making is reasonable and acceptable. Further to this, validation team cross checked the benchmark using default values following ‘Guidelines on the assessment of the investment analysis’ as below: As per paragraph 15 of Guidelines on the assessment of the investment analysis (Version 05, EB 62), the value for cost of equity can be selected from Appendix. The value of Return on	

	Validated situation	Conclusion
	Equity for Group-1 projects (category applicable to the project activity) in India is 11.75%. As per paragraph 7 of Appendix of the above mentioned document, in situations where an investment analysis is carried out in nominal terms, project participants can convert the real term values provided in the table below to nominal values by adding the inflation rate. The inflation rate shall be obtained from the inflation forecast of the central bank of the host country for the duration of the crediting period. If this information is not available, the target inflation rate of the central bank shall be used. If this information is also not available, then the average forecasted inflation rate for the host country published by the IMF (International Monetary Fund World Economic Outlook) or the World Bank for the next five years after the start of the project activity shall be used. The PP has taken the option of considering “The inflation rate shall be obtained from the inflation forecast of the central bank of the host country for the duration of the crediting period”. Since the data available is for 5 and 10 Year period, the minimum data among 5 year period and 10 year period has been considered, which results in a conservative benchmark. The relationship between real rate and nominal rate is (Fisher formula)¹²: $R_n = (1 + R_r)(1 + R_i) - 1 = R_r + R_i + R_r R_i$ Where, R_n is nominal rate, R_r is real rate and R_i is inflation rate. $R_n = (1 + 11.75\%)(1 + 5.0\%) - 1 = 17.34\%$ The validation team confirmed that the IRR does not cross the lowest possible benchmark calculated based on default value i.e. 17.34% even after conducting sensitivity analysis. In the above context, the benchmark computed by PP is deemed reasonable in context of the latest Guidelines on the assessment of the investment analysis (Version 05, EB 62) and hence acceptable.	

	Validated situation	Conclusion
5. In case 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, i.e. 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	NA

Comparison to similar registered project in the region:

As the PP does not rely on values from a Feasibility Study Report (FSR) approved by any national authority, project comparison is not undertaken.

CDM Ref	Investment cost (Million INR)	Tariff (INR/KWh)	O&M cost (Million INR/year)	Capacity (MW)	Output (MWh)	Investment cost per output (Million INR/MW)	Load factor i.e PLF (%)	O&M relative to investment (%)	O&M per output (Million INR/MWh)
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	NA			
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.	The PP has presented common practice analysis in accordance with the stepwise approach prescribed by the Tool for the demonstration and assessment of additionality Version 06.0.0 In accordance with Para 5 Tool for the demonstration and assessment of additionality Version 06.0.0, the PP had considered the entire host country as default to determine the geographical area. The validation confirms the geographical area determined by the PP is appropriate and in accordance with Para 5 Tool for the demonstration and assessment of additionality Version 06.0.0 and paragraph 120 (a) of the CDM VVM Version 01.2.	OK CAR07-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.	In accordance to the Para 47 of the Tool for the demonstration and assessment of additionality Version 06.0.0, the PP had demonstrated the common practice analysis in stepwise manner In Step 1, the PP has correctly stated the projects with similar output, i.e. projects with installed capacity between 19.80MW and 59.40 MW In Step 2, the PP has considered geographical area as the host country. This is the default option prescribed in the paragraph 1 of the guideline and paragraph 120 (a) of the CDM VVM Version 01.2. The PP has identified 439 power plants that deliver the same output or capacity projects. The validation team confirms similar project from the review of CO₂ Baseline Database Version 06, wind power directory 2011 and publicly available information for nuclear and biomass based power plants. In Step 3, out of the 439 identified power plants, the PP has calculated the N_{diff} as 430 by removing the similar wind projects. The identified power plants with different technology that includes 140 thermal power plants, and 222 hydro power plants and 68 biomass projects.	OK CAR07-Closed

	Validated situation	Conclusion
	In Step 4, the PP has calculated F factor which is 0.0205. The applied tool specifies in conclusion to paragraph 47 that: <i>“The proposed project activity is a “common practice” within a sector in the applicable geographical area if both the following conditions are fulfilled: (a) the factor F is greater than 0.2, and (b) $N_{all} - N_{diff}$ is greater than 3.”</i> Since one of the above criteria is not fulfilled, the validation team has concluded that the project activity is not a common practice in India. The validation team has cross-checked the installed capacity from the archived report publicly available in the CEA website (http://www.cea.nic.in/archives.html), MNRE website and Wind power directory 2011 and confirmed the correctness and appropriateness of the data used by the PP in the common practice analysis. However, CAR 07 was raised initially at the time of validation. The resolution of the finding is mentioned in the protocol of this report.	
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.	This step has been covered in the above step.	OK

			Validated situation	Conclusion
SECTION 7. Monitoring plan				
1. <i>Compliance of the monitoring plan with the approved methodology.</i> 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 Meth description	PDD description	Validated situation	Conclusion
EG_{facility,y}	Data unit: MWh/yr 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/yr Description: Quantity of net electricity generation supplied by the project plant/unit to the grid in year y Source of data: Form- B of Karnataka Power Transmission Corporation Limited (KPTCL) Measurement procedures (if any): Electricity meters In present project activity, the electricity being generated by 24 wind turbines is monitored at the dedicated Haraknal substation located at Harapanahalli. In the substation, there are two meters namely- Check Meter and Main Meter (static type Trivector meter, Accuracy class: 0.2. Every month BESCOM Official visits the	The 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/year and the value of data is 81,200 MWh/year. The monthly break up report (stated as Form-B issued by KPTLCL in project case) provided by the state utility shall be used as source for EG_{facility,y}. This was confirmed during the interaction with operation and maintenance staff of the technology supplier and PP representatives. Measurement methods: There shall be feeder-wise monitoring arrangements to measure the electricity export and electricity import using tri vector energy meters of 0.2s accuracy class. The meter accuracy class was also confirmed through the	OK ~~CAR05-Closed~~

¹³ Note: Days wherein no (zero) generation occurs will be excluded

		substation in the presence of O&M team of wind turbine Supplier (Vestas) and the Main meter reading is taken jointly and recorded by BESCOM. The said meter readings are reported by the Field Officer to the concerned distribution circle who in turn informs to the consumption circle, which is authorized to prepare the Bill and give the credit for the energy generated by the wind turbines. The Haraknal sub-station has the provision for 4 feeders of which two are currently in operation. At the time of commissioning, 13 nos of WTGs were connected to Feeder 1 and the remaining 11 WTGs of the project activity were connected to Feeder 2 at the Haraknal Substation. Currently the Haraknal sub-station handles only 24 WTGs which are owned by CLPWFL. The meter readings are taken at the sub-station every 24 hours. A 33 kV reference meter is also present which is generally used by KPTCL for comparison. Since the capacity of the wind farm is higher, there is a possibility of more machines (WTGs) being installed and hence the bulk meter may have (in future) more machines connected to it. If this scenario occurs, the following apportioning mechanism will be used. Specific Calculation Procedure (For the time period during start and end of each crediting period) :	review of the calibration report issued by KPTCL. The arrangement of main and check meters for monitoring of net electricity generation as stated in PDD was confirmed during the site visit. The apportioning mechanism described in the PDD is confirmed to be appropriate. The responsibility for testing and calibration of meters is with BESOM and shall be undertaken in accordance with the PPA requirements. This is confirmed through the discussions held with operation and maintenance staff of the technology supplier and interaction with substation engineer. The QA/QC procedure is described in the PDD in line with the methodology requirement and is appropriate.	
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		For the time period during start and end of each crediting period, the following apportioning formula would be used to estimate the electricity generation for calculating emission reductions: X = No. of days between start/end date of crediting period and date of BESCO's billing cycle¹³ Y = Total no. of days in a particular month for which Form B reading has been taken Z= No. of units as per Form B for that particular month Electricity Generation = (X/Y) * Z OR alternatively the daily readings taken by the technology supplier at the site will be referred for calculating the generation for X days. Days wherein no (zero) generation occurs will be excluded from emission reduction calculations. <u>Feeder wise apportioning mechanism</u> At anytime during the crediting period, if there are additional WTGs (which are not a part of this project activity) connected with the bulk meter(s) at Haraknal sub-station, the apportioning mechanism listed in PDD section B.7.2 would be used. The net electricity recorded at the substation is apportioned to individual WTGs based on the generation at the		
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		WTG as per the formula given below: Electricity exported by WTG to Grid, $EG_{exp, y} = (\% \text{ generation of individual WTG connected to feeder}) \times (\text{Electricity Export recorded at substation}),$ Where, $\% \text{ generation of individual WTG connected to feeder}$ $= (\text{Controller reading @ Individual WTG}) / (\text{Sum of Controller reading of all WTGs connected on feeder})$ Similarly, electricity imported by the WTG from the grid, $EG_{imp, y} = (\% \text{ generation of individual WTG connected to feeder}) \times (\text{Electricity Import recorded at substation})$ EG_{facility,y} = EG_{exp, y} – EG_{imp, y} Monitoring frequency: Continuous measurement and at least monthly recording QA/QC procedures: The main meter readings can be cross checked with the check meter readings to ensure correctness. The main and check meters shall be calibrated and maintained by BESCOM as per their own schedule and this frequency of meter calibration is not within the control of the Project Proponent. Accuracy class of Main meter and Check meter: 0.2 Frequency of testing: once in a quarter of a calendar year		
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		Responsibility: BESCOM will test and calibrate the meters. Cross check measurement results with records for sold electricity (Invoices raised by PP) Any comment: Data will be kept for crediting period + 2 Years		
EF _{grid CM,y}	Data unit: tCO₂ /MWh Description: 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” Source of data: As per the ‘Tool to calculate the emission factor for an electricity system’ Measurement procedures (if any): As per the “Tool to calculate the emission factor for an electricity system” Monitoring frequency: As per the “Tool to calculate the emission factor for an electricity system” QA/QC procedures: As per the “Tool to calculate the emission factor for an electricity system”	Data unit: tCO₂ /MWh Description: 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” Source of data: Latest version of the CO₂ baseline database for the Indian Power Sector published by CEA Measurement procedures (if any): As per the “Tool to calculate the emission factor for an electricity system” Monitoring frequency: As per the “Tool to calculate the emission factor for an electricity system” QA/QC procedures: Not applicable as this data would be sourced from a third party Any comment: Data will be kept for crediting period + 2 Years	The data unit, description, source of data used, measurement, monitoring and QA/QC procedures described in the PDD are in line with the methodology and are appropriate.	OK

	Any comment:			
EF _{grid,OM,y}	Data unit: tCO₂ /MWh Description: Operating margin CO2 emission factor in year y Source of data: CO₂ baseline database (Version 6.0) published by CEA in March 2011 Measurement procedures (if any): As per the “Tool to calculate the emission factor for an electricity system” This value is derived by taking the Simple Operating Margin of the most recent year for Southern grid. Monitoring frequency: Simple OM, simple adjusted OM, average OM: Either once for each crediting period using the most recent three historical years for which data is available at the time of submission of the CDM-PDD to the DOE for validation (ex ante option) or annually during the crediting period for the relevant year, following the guidance in Step 3 above QA/QC procedures: - Any comment:	Data unit: tCO₂ /MWh Description: Operating margin CO2 emission factor in year y Source of data: Latest version of the CO₂ baseline database for the Indian Power Sector published by CEA Measurement procedures (if any): As per the “Tool to calculate the emission factor for an electricity system” This value is derived by taking the Simple Operating Margin of the most recent year for Southern grid. Monitoring frequency: annually during the crediting period for the relevant year QA/QC procedures: Not applicable as this data would be sourced from a third party Any comment: Data will be kept for crediting period + 2 Years	The data unit, description, source of data used, measurement, monitoring and QA/QC procedures described in the PDD are in line with the methodology and are appropriate.	OK

EF _{grid,BM,y}	Data unit: tCO₂ /MWh Description: Build margin CO2 emission factor in year y Source of data: CO2 baseline database (Version 6.0) published by CEA in March 2011 Measurement procedures (if any): As per the “Tool to calculate the emission factor for an electricity system”. Monitoring frequency: BM: For the first crediting period, either once ex ante or annually ex post, following the guidance included in Step 5. For the second and third crediting period, only once ex ante at the start of the second crediting period QA/QC procedures: - Any comment:	Data unit: tCO₂ /MWh Description: Build margin CO2 emission factor in year y Source of data: Latest version of the CO₂ baseline database for the Indian Power Sector published by CEA Measurement procedures (if any): As per the “Tool to calculate the emission factor for an electricity system”. This value is for the most recent year for Southern grid. Monitoring frequency: BM: For the first crediting period, either once ex ante or annually ex post, following the guidance included in Step 5. For the second and third crediting period, only once ex ante at the start of the second crediting period QA/QC procedures: Not applicable as this data would be sourced from a third party Any comment: Data will be kept for crediting period + 2 Years	The data unit, description, source of data used, measurement , monitoring and QA/QC procedures described in the PDD are in line with the methodology and are appropriate.	OK
2. <i>Implementation of the plan.</i> 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 organisational structure, roles and responsibility, the monitoring instruments, data monitoring procedures, emergency preparedness and the management system. During the site visit, the validation team has confirmed that the monitoring is planned in a reasonable manner and considered feasible to be implemented by the PP.			OK ~~CAR05 Closed~~

3. <i>Implementation of the Plan:</i> 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, ensuring reliable monitoring and reporting of the ERs.	OK ~~CAR05 Closed~~
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	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.	Local stakeholders were invited. The PP had conducted the local stakeholders meeting on 01/02/2011. The PP issued an open invitation notice on 06/01/2011 inviting stakeholders to participate in the meeting. In the stakeholders' meeting, discussion was made on the project's potential impact to the local environment, potential adverse effects and the expected benefits to the local community. Justification given by the PP was presented during the meeting and it is described in the PDD. Review of the Stakeholder meeting minutes shows that people were supportive of the project activity and expressed no negative comment on the project activity. During the site visit, the validation team confirmed with a section of the stakeholders on the meeting conducted by the PP and the mode of invitation extended for the meeting. It was also confirmed that they had no concerns with respect to the project activity. The stakeholders confirmed their presence in the stakeholder meeting held by the PP and that they had no concerns with respect of the project activity. Stakeholders appreciated the opportunity offered to the local villagers as security guards and commented that due to the installation of such wind projects, road conditions in the area have improved. LRQA confirms that the local stakeholder consultations were adequate with respect to identification of local stakeholders, seeking their views and taking due account of any comments and conducted in a transparent manner. The stakeholder consultation process, targeted stakeholders and due actions for concerned issues have been clarified in the PDD.	OK
2. Confirm that the summary of the comments received as provided in the PDD is complete.	The validation team confirmed that the summary of the comments received as provided in the PDD is complete.	OK

	Validated situation	Conclusion
3. Confirm that the project participants have taken due account of any comments received and have described this process in the PDD.	No comment was received that requires further action by the PP.	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.	The Ministry of Environment & Forests (MoEF), Government of India, under Environment Impact Assessment (EIA) notification vide S.O 1533(E) dated 14/09/2006 specified a list of projects/activities in Schedule I of the said notification, which for setting up new projects or modernisation or expansion, would require prior environmental clearance and which may call for an EIA as a part of obtaining environmental clearance. As per the said notification and Schedule 1 of the latest Environmental Impact Assessment (EIA) notification dated 1/12/2009, the proposed project activity does not require any EIA to be conducted.	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

Findings¹⁴

1. Grade / Ref:	CAR 01	2. Date:	20/05/2011	3. Status:	Closed
4. Requirement:	CDM VVM Para 44 & 51				
5. Nature of the Issue Raised:	The Letter Of Approval (LOA) for this project activity from the host country has not been submitted by the PP for validation.				
6. Nature of responses provided by the project participants:	The LoA dated 10/04/2012 issued by National CDM authority is being submitted now.				
7. Assessment of such responses:	The PP provided the LoA dated 10/04/2012, having reference number 4/22/2011-CCC. Hence, the validation team could confirm the participation requirement.				
8. References to resulting changes in the PDD or supporting annexes:	NA				

¹⁴ 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	

1. Grade / Ref:	CAR 02	2. Date:	20/05/2011	3. Status:	Closed
4. Requirement:		Paragraph 55 of the VVM Version 01.2 and Guideline for completing the CDM-PDD Version 07			
5. Nature of the Issue Raised:					
1. Detail of physical location, including information allowing the unique identification of this project activity (including WTG-wise details as confirmed during the site visit) are not available in section A.4.1.4 2. Although the technology details are included in section A.4.3, the description on following is not included ➤ age and average lifetime of the equipment based on manufacturer's specifications and industry standards ➤ the monitoring equipment and their location in the systems 3. The technical specifications of WTG model for e.g. cut-in, cut-out and rated wind speed etc could not be confirmed from the copy of technical specifications provided for validation 4. The project boundary diagram in section B.3, does not include the monitoring variables and monitoring locations 5. Section B.6.3 of the PDD, does not provide a transparent <i>ex ante</i> calculation of project emissions, baseline emissions (or, where applicable, direct calculation of emission reductions) and leakage emissions expected during the crediting period, applying all relevant equations provided in the approved methodology. Each equation applied for calculation of emission reduction is not documented in the PDD in a manner that enables the reader to reproduce the calculation. 6. Section B.7.1 of the PDD, does not specify the measurement methods and procedures, including a specification which accepted industry standards or national or international standards will be applied, which measurement equipment is used, how the measurement is undertaken, which calibration procedures are applied, what is the calibration frequency, what is the accuracy of the measurement method					
6. Nature of responses provided by the project participants:					
1. WTG-wise details are provided in the section A.4.1 and PDD is updated accordingly. 2. • Age and average lifetime of the equipments based on manufacturer's specifications and industry standards are mentioned in the section A.4.3 in the revised PDD. Supporting Evidence provided • The monitoring equipments and their location in the systems are shown in the project boundary diagram in section B.3 of the revised PDD. 3 The chart is provided on page 10 of Doc. 2 WTG Details submitted as a part of the Additional Information Request (AIR). The chart details the cut-in, cut-out and rated wind speeds. Please refer to the technical specification of the WTG. 4 Generation of all wind turbines are being metered at the dedicated substation located at Harapanahalli. The same will be monitored at the substation shown in the project boundary diagram. b. Monitoring equipments and locations have now been cross referred in section A.4.3 5 The section B.6.3 of the PDD has been updated accordingly. 6 The measurement methods and procedures have been mentioned in Section B.7.1. PDD has been updated accordingly.					
7. Assessment of such responses:					
1. WTG details are now provided in the revised PDD section A.4.1					

2. a. Age and lifetime of the equipment is specified in section A.4.3 of the revised PDD. The lifetime is confirmed from the Type Certificate issued by DET NORSKE VERITAS (DNV). Certificate No-IEC TC-212401-0 issued by DNV confirms the design lifetime of WTG as 20 years
- b. Monitoring equipment and locations shown in project boundary diagram and the same can be cross-referred in section A.4.3
3. Cut-in wind speed and rated wind speed could be found on page 10 of Doc 2.WTG Details, also cut out wind speed could be found
4. Monitoring equipment and locations now shown in project boundary diagram
5. All equations used for calculation of emission reductions are now described in section B.6.3 of the PDD
6. Comments have been suitably addressed and section B.7.2 has been revised

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

Section A.4.1, A.4.2, B.3, B.6.3, B.7.2 of PDD

1. Grade / Ref:	CAR 03	2. Date:	20/05/2011	3. Status:	Closed
4. Requirement:	Guidelines for completing the Project Design Document (CDM-PDD), Version 07 Guidelines on the demonstration and assessment of prior consideration of the CDM, Version 04				
5. Nature of the Issue Raised:	In section B.5 of the PDD, the exact dates for all the events are not stated				
6. Nature of responses provided by the project participants:	Exact dates for all the events are now mentioned in section B.5 and the PDD is updated accordingly.				
7. Assessment of such responses:	The dates now inserted for the events. The dates match with the earlier submitted evidence and hence the finding is closed.				
8. References to resulting changes in the PDD or supporting annexes:	Section B.5 of the PDD				

1. Grade / Ref:	CAR 04	2. Date:	20/05/2011	3. Status:	Closed
4. Requirement:	Guidance on assessment of investment analysis Version 05 Paragraph 109 & 110 of the VVM Version 01.2				
5. Nature of the Issue Raised:					
Related to investment analysis: 1. The investment analysis is not presented in a transparent manner in the PDD, for all the relevant assumptions used for investment analysis the data sources/references are not stated 2. The offer letter provided by the service provider is not provided for validation 3. The Operation and Maintenance of WTGs, Monitoring & Reporting of daily electricity generation by WTGs has been taken care by the service provider and the same was confirmed by the validation team during the site visit. Hence, the PP to justify the inclusion of the Asset Manager cost in the investment analysis. The supporting evidence for the same is also not provided for validation. 4. As per Income Tax Act sec 80IA, the company can claim tax benefits for a period of 10 consecutive years, but why such benefits are not included in the investment analysis are not justified. 5. Although MAT is considered, the PP to justify why MAT credit is not be considered 6. Related to project cost: ➤ IDC workings are not provided. ➤ Why the preliminary expenses and contingency to be added ➤ In the break up provided for project cost, the Upfront fees for CDM certification are also considered – PP to justify the inclusion of the same ➤ Supporting evidence for the preliminary and preoperative expenses need to be provided 7. Debt Value: ➤ Debt/Equity value is calculated based on project cost (which includes IDC), which is not appropriate. Also the supporting evidence for the Debt/Equity ratio is not provided ➤ The loan application and the loan sanction letter are not provided for validation 8. IT Depreciation Rate: ➤ Taken at 7.69% on SLM. However, wind projects are also eligible for 80% accelerated depreciation. 9. Salvage Value: ➤ Taken at 5%, as against normal practice of 10% however the reference for the assumption is not stated 10. Service Tax on O&M Expenses (Row 6): ➤ As service tax is calculated on Row 5, which has given effect of one time escalation in the 11th year, adding escalation to service tax also in 11th year (Cell M6) is double charge 11. O&M Contingency: ➤ Contingency calculated in first three years also, which is not in line with Input Parameters. 12. Sensitivity: ➤ Sensitivity for Project cost – As the formula is applied to total project cost (C11 in Input Parameters) and depreciation is calculated on only Capital cost, the impact of sensitivity on depreciation and resulting impacts are not correctly reflected.					

6. Nature of responses provided by the project participants:

1. All references and data sources are provided in section B.5 of the PDD and the PDD is modified accordingly.
2. Offer letter by Vestas is provided.
3. The supporting evidence for Asset Manager Cost has been attached. However, the costs for hiring the Asset Manager have been excluded from financial analysis now.
4. Benefits under sec 80 I A had already been considered. Based on the project cash flows, currently there are two years when the project is able to claim the tax benefit u/s 80 IA. Please refer to excel sheet shared.
5. MAT Credit has been considered now. The IRR sheet and PDD are updated accordingly.
IDC component has been excluded from total project cost estimation Upfront fees for CDM certification have been removed from the total project cost estimation Supporting evidence for preliminary and preoperative expenses is provided.
6. The costs for IDC, preliminary expenses, contingency and upfront fees for CDM certification are now being removed from the revised financial analysis and PDD.
7. The loan sanction letter (Term Sheet) is now shared with the DOE. Debt: Equity ratio is mentioned in the loan document.
8. The project proponent has considered Generation Based Incentives (GBI) for this project and not availed Accelerated Depreciation Benefits (as per GBI scheme guidelines by MNRE/ IREDA). The GBI scheme document is already shared with the DoE as a part of the AIR.
9. Depreciation is taken @ 5.28% for plant & machinery as per the companies act. With this rate, the entire amount of plant & machinery is depreciated in 19 years. At the end of 20th year there is no balance amount available for depreciating. Thus PP's consideration of 5% salvage value is conservative.
10. The necessary corrections have been made and IRR sheet has been updated accordingly along with B.5 Section of PDD.
11. O&M contingency is now removed from the revised financials.
12. The sensitivity analysis has been modified to address this point and the PDD has updated accordingly.

7. Assessment of such responses:

1. All references and data sources are provided in section B.5 of the PDD and the revised PDD is provided by the PP.
2. Offer letter by Vestas is provided.
3. The supporting evidence for Asset Manager Cost has been provided and found to be acceptable.
4. Benefits under sec 80 I A confirmed to be included in the investment analysis.
5. MAT Credit has been considered now. The IRR sheet and PDD are updated accordingly.
6. Costs for IDC, preliminary expenses, contingency and upfront fees for CDM certification are removed from the revised financials and PDD. This is deemed conservative and appropriate.
7. The loan sanction letter was reviewed by the validation team to confirm the debt:equity ratio.
8. Validation team confirms consideration of GBI for the project.
9. PP's consideration of 5% salvage value is conservative and accepted
10. The necessary corrections have been made and IRR sheet has been updated accordingly along with B.5 Section of PDD.
11. O&M contingency has been excluded from the revised IRR spreadsheet and PDD (Section B.5) have been updated accordingly. This is appropriate and conservative.
12. The sensitivity analysis has been modified to address this point and the PDD has updated accordingly.

8. References to resulting changes in the PDD or supporting annexes:					
Section B.5 of the PDD					
1. Grade / Ref:	CAR 05	2. Date:	20/05/2011	3. Status:	Closed
4. Requirement:		Guidelines for completing the CDM PDD Version 07 Paragraph 109 & 110 of the VVM Version 01.2			
5. Nature of the Issue Raised:					
The following items were noted in the monitoring plan: 1. The project activity is operational and it was observed during the site visit that additional capacity (other WTG owners) will be added to the substation feeder, however the apportioning mechanism to be followed by the state utility (as stated in the power purchase agreements) for calculation of net generation of machines installed by PP is not stated in section B.7 of the PDD. 2. Parameter EGfacility,y, represents the quantity of net electricity generated by the project activity. However, it is the summation of individual WTG wise net electricity generation values; this is not clearly stated in the PDD section B.7 3. The source of data to be used for “quantity of net electricity generated by the project activity” is stated as Joint Meter Reading Sheets, however as confirmed from the site visit, the format used by state utility is said as Form-B.					
6. Nature of responses provided by the project participants:					
1. The apportioning mechanism to be followed by the state utility for computation of net generation of machines installed by PP is stated in section B.7 of the PDD and the PDD is updated accordingly. 2. EGfacility,y is the quantity of net electricity generated by the project activity and also includes the project imports. The PDD section B.7 has been updated to include this information. 3. PDD section B.7 has been updated to include Form B as the source of data for “quantity of net electricity generated by the project activity” parameter.					
7. Assessment of such responses:					
1. The apportioning mechanism is now defined in the revised PDD and is in line with that observed during the site visit and hence appropriate. 2. Revised PDD clearly describes the monitoring mechanism for net electricity generation after accounting of imports and hence finding is closed 3. Terminology JMR was removed from the PDD to replace with Form-B. PDD is updated accordingly and hence finding is closed.					
8. References to resulting changes in the PDD or supporting annexes:					
Section B.7 of the PDD					

1. Grade / Ref:	CAR 06	2. Date:	05/06/2011	3. Status:	Closed
4. Requirement:	Guidelines on the Assessment of Investment Analysis (Version 04) Paragraph 122 of the VVM Version 01.2				
5. Nature of the Issue Raised:	Benchmark Calculation PP to justify the suitability of vintage year for BSE-500 Index data given that the vintage year of BSE-500 index data is only for 11.41 years from February 1999 – 30/06/2010 whereas the financial analysis is performed for a 20 year operation period.				
6. Nature of responses provided by the project participants:	The vintage for calculating the market returns were considered since the inception of the BSE-500 index and hence was the only data available with the PP at the time of investment decision making.				
7. Assessment of such responses:	The expected rate of return of market portfolio has been calculated by the PP based on the compounded annual growth rate (CAGR) of publicly available BSE-500 Index data for a period of 11.41 years from February 1999 – 30/06/2010¹⁵. The Bombay Stock Exchange Limited constructed an index, christened BSE-500, consisting of 500 scripts. The changing pattern of the economy and that of the market were kept in mind while constructing this index. BSE-500 Index is a broad-based Index consisting of 500 companies across 20 sectors listed at the Exchange, representing approximately 93% of the total market capitalisation on BSE and covers all 20 major industries of the economy¹⁶. This is the most diversified index of the entire stock indices portfolio at the BSE. BSE-500 Index is scientifically calculated and the 500 companies are selected based on market capitalisation, liquidity and balanced industry representation. The BSE-500 index 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. As the BSE-500 index represents a widely diversified portfolio in terms of quantum of companies, the selection of the same for the calculation of R_m used in CAPM was deemed to be appropriate 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 30/06/2010 (prior to investment decision date), which amounts to 11.41 years. As per “Equity Risk Premiums (ERP): Determinants, Estimation and Implications”, by Aswath Damodaran¹⁷, the use of vintage data for 10 years and above is considered an acceptable practice. Hence, it was concluded that the computation of expected market returns using data for a period of 11.41 years is appropriate. Validation team has reviewed the revised PDD and confirms the suitability of using Option a) given in Guidance 15 of the “Guidelines on the Assessment of				

¹⁵ Period since inception of BSE 500 index (February 1999) has been considered

¹⁶ <http://www.bseindia.com/about/abindices/bse500.asp>

¹⁷ <http://pages.stern.nyu.edu/~adamodar/pdfiles/papers/ERPfull.pdf>

Investment Analysis (Version 05)" for computation of benchmark. It was also noted that the benchmark computed using default values given in Appendix A of the Guidelines comes to 17.34%. Validation team confirmed that the IRR does not cross the lowest possible benchmark calculated based on default value i.e. **17.34%** even after conducting sensitivity analysis.

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

Section B.5 of the PDD

1. Grade / Ref:	CAR 07	2. Date:	29/02/2012	3. Status:	Closed
4. Requirement:	Paragraph 119 of the VVM Version 01.2				
5. Nature of the Issue Raised:	The demonstration of the common practice is not in line with the applied tool i.e "Demonstration and assessment of additionality" Version 06.0.0				
6. Nature of responses provided by the project participants:	Common Practice Analysis has now been revised in accordance with "Tool for demonstration and Assessment of Additionality" version 6.0.0.				
7. Assessment of such responses:	The PP has revised the common practice analysis with reference to the Tool for demonstration and Assessment of Additionality" Version 6.0.0, in accordance with stepwise approach. The validation team confirms that the factor F is less than 0.2 and the project is not a common practice in the geographical area selected by the PP. Therefore the finding is closed.				
8. References to resulting changes in the PDD or supporting annexes:	Section B.5				