

Validation Report

Report for:
Powerica Limited

Validation of CDM project for Green Energy Project at Gujarat by Powerica Limited

LRQA Reference : CDM-MUM-0061879
Version 07
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1 Executive Summary

Lloyd's Register Quality Assurance Limited has been contracted by Powerica Limited, the project participants (PP), to undertake validation of the proposed project activity "Green Energy Project at Gujarat by Powerica Limited". The validation has been performed through a process of document review based on the project design document, version 01 dated 30/01/2012, 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 is a 25.2 MW wind power project involving 14 WTGs of 1.8 MW capacity each. Initially, the project was conceptualised for 27 MW consisting of 15 WTGs of 1.8MW each, but during the final implementation of the project, only 14 of these 15 WTGs were installed due to unavailability of land at the project site. The proposed project intends to reduce greenhouse gas (GHG) emission by utilising wind resource to generate electricity. The project activity is located in the villages Jangi, Vandhiya, Godpar and Lakhdarghad in Bhachau Taluk, Kutch district in the state of Gujarat. The electricity generated by the project activity will be supplied to the regional grid, i.e. the Integrated Northern, Eastern, Western and North Eastern Grid (NEWNE Grid) for Gujarat site. It will reduce the need for power generation from the conventional fossil fuel based power plants, thereby leading to a reduction of GHG emissions.

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

The validation team has found through the validation process 6 CARs and 1 CL. The PP has taken actions and submitted the revised project design document (PDD), revised investment analysis & emission reduction spreadsheet and supporting evidence. The validation team is of the opinion that the proposed project activity as described in the project design document Version 05 dated 24/01/2013 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 "Green Energy Project at Gujarat by Powerica Limited" to the CDM Executive Board as a CDM project activity.

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Abbreviations

ABT	Availability Based Tariff
ACM	Approved Consolidated Methodology
AE	Applicant Entity
BE	Baseline emissions
BM	Build Margin
BSE	Bombay Stock Exchange
CAGR	Compounded Annual Growth Rate
CAPM	Capital Asset Pricing Model
CARs	Corrective action requests
CDM	Clean development mechanism
CDM-EB	Executive board of clean development mechanism
CDM M&P	Modalities and procedures for a clean development mechanism
CDM VVM	CDM Validation and Verification Manual
CEA	Central Electricity Authority
CERs	Certified emission reductions
CLs	Clarification requests
CM	Combined Margin
COP/MOP	Conference of the Parties serving as meeting of the Parties to the Kyoto Protocol
CPA	Common Practice Analysis
CUF	Capacity Utilisation Factor
DJIA	Dow Jones Industrial average
DNA	Designated national authority
DOE	Designated operational entity
DNV	Det Norske Veritas
EF	Emission factor
EIA	Environmental impacts assessment
ERP	Equity Risk Premium
FAR	Forward action requests
GEDA	Gujarat Energy Development Agency
GETCO	Gujarat Energy Transmission Corporation Limited
GERC	Gujarat Electricity Regulatory Commission
GHG	Greenhouse gas
GMT	Greenwich Mean Time
GPS	Global Positioning System
GSP	Global stakeholders' consultation process
GUVNL	Gujarat Urja Vikas Nigam Limited
HCA	Host Country Approval
IRR	Internal rate of return
IT	Income Tax
KP	Kyoto Protocol of the United Nations Framework Convention on Climate Change
kW / kWh	Kilowatt / Kilowatt hour
LE	Leakage emissions
LLC	Limited Liability Company
LoA	Letter of approval
LR	Lloyd's Register
LRQA	Lloyd's Register Quality Assurance Limited
MW / MWh	Mega watt / Mega watt hour
MNRE	Ministry of New and Renewable Energy
MOC	Modalities of Communication
MoEF	Ministry of Environment and Forest
M/s	Messrs

NCDMA	National Clean Development Mechanism Authority
NCV	Net calorific value
NEWNE	Integrated Northern, Eastern, Western and North Eastern Grid
NGO	Non governmental organization
NPV	Net Present Value
NYSE	New York Stock Exchange
ODA	Official development assistance
OM	Operating Margin
O&M	Operation & Maintenance
PDD	Project design document
PE	Project emissions
PLF	Plant Load Factor
PP	Project participant
PPA	Power Purchase Agreement
RoE	Return on Equity
SLDC	State Load Despatch Centre
tCO ₂ e	Tonnes of carbon dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change
WTG	Wind Turbine Generator

2 Introduction

The project participant (PP) Powerica Limited has contracted with Lloyd's Register Quality Assurance Limited (LRQA) to undertake validation of the proposed project activity "Green Energy Project at Gujarat by Powerica Limited". 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:

Ankush Jain	LRQA Ltd. India	Team Leader, CDM Lead Validator and Sector Expert
Syju Alias	LRQA Ltd. India	Team Member, CDM Validator
Ajesh Kumar	LRQA Ltd. India	Technical Reviewer and Sector Expert
Andrew Ritchie	LRQA Ltd.	Decision Maker
Javier Vallejo Drehs	LRQA Ltd.	Decision Maker after request for registration rejection in the I&R check.

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

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

Powerica Limited is involved in the installation of a 25.2 MW wind power project (14 × 1.8MW) located in the villages Jangi, Vandhiya, Godpar and Lakhdarghad in Bhachau Taluk, Kutch district in the state of Gujarat in India. Initially the project was conceptualised for 27 MW consisting of 15 WTGs of 1.8MW each, but during the final implementation of the project, only 14 of these 15 WTGs were installed due to unavailability of land at the project site. The electricity will be sold to Gujarat Urja Vikas Nigam Limited (GUVNL), based on the Power Purchase Agreement (PPA) signed by PP. The exported electricity from the project activity will displace equivalent electricity from the connected grid which is primarily fossil fuel based and hence will result in reduced greenhouse emissions. The validation team confirms that the Wind Turbine Generators (WTGs) of Vestas make of capacity 1.8 MW are based on a proven technology used elsewhere in the host country for electricity generation using wind energy.

The project activity is categorised in the sectoral scope 1 – Energy industries (renewable/non-renewable sources).

The estimated GHG emission reduction is 61,360 tCO₂e per annum during the fixed crediting period of 10 years. The emission reduction has been estimated based on the ex-ante Plant Load Factor (PLF) estimated by AWS Truepower LLC, a third party.

3 Methodology

3.1 Review of documents

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

The PDD Version 01 dated 30/01/2012 was initially reviewed. LRQA requested the PP to present supporting information and documents relating to the project design and such additional information and documents were also reviewed by LRQA.

Through the process of the validation, the PDD and the supporting documents of the same were evaluated to confirm the actions taken by the PP to the CARs and CL issued by LRQA. The documents reviewed by LRQA are listed in Appendix B. LRQA reviewed the final version of the PDD Version 05 dated 24/01/2013 to confirm that all changes agreed had been incorporated.

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

3.2 Site Visit and Follow-up interviews

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

Date	Location/ Address	Party Interviewed	Subjects Covered	Team Members on Site
16/04/2012	Project Site / Gujarat	Technology supplier, Local stakeholders & Local authorities	- Project Idea – Selection of Site and Technology - Project boundary issues/discussions - Projects contribution to	Ankush Jain Syju Alias

Date	Location/ Address	Party Interviewed	Subjects Covered	Team Members on Site
			sustainable development • Performance of WTGs – Power generation, grid availability, PLF, Machine availability, losses • Physical identification of WTG based on unique identification number • Operation and Maintenance of WTGs • Procedures for monitoring & reporting, QA/QC systems, training programme • Data collection, monitoring and recording through SCADA system • Legal requirements • Electricity metering provision (Joint meter reading, if any), • Calibration schedule of energy meters • Institutional arrangement of data collection and archiving • Record keeping – daily production report, operation log • Provisions for internal audits • Emergency preparedness • Discussion on local stakeholder consultation process • Discussion on land ownership, land sale deeds • Discussion on environmental impact assessment of the project	
18/04/2012	Corporate office of PP / Mumbai	Project Participant	• Selection of technology • Selection of site • Review of board minutes and working documents considered at the time of Investment decision • Funding for project activity/Benchmark selection • Input values/assumptions considered at the time of decision making for investment analysis • Serious consideration of CDM	Ankush Jain Syju Alias

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

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

3.3 Resolution of clarification and corrective action requests

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

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

Corrective action request (CAR):

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

Clarification request (CL):

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

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

CARs and CLs are to be resolved or closed out if the PP modifies the project design, rectifies the PDD or provides adequate additional explanations or evidence that satisfies the concerns. If this is not completed, the project activity cannot be recommended for registration to the CDM Executive Board.

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

3.4 Internal quality control

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

4 Validation protocol and conclusions

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

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

- Approval by the Parties involved
- Participation requirements
- Project design document
- Project description
- Baseline and monitoring methodology
 - Applicability of the selected methodology
 - Project boundary
 - Baseline identification
 - Algorithms and/or formula used to determine emission reductions

- Additionality of a project activity
 - Prior consideration of the CDM
 - Identification of alternatives
 - Investment analysis
 - Barrier analysis
 - Common practice analysis
- Monitoring plan
- Local stakeholder consultation
- Environmental impacts.

4.1 Approval

A CDM project shall be approved by the Parties involved.

The host Party of the proposed project is India. India has ratified the Kyoto Protocol on 26 August 2002. 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. A letter from approval from the host country, reference number 4/12/2012-CCC dated 10/10/2012 has been received. This letter of approval confirms the contribution of the project activity “Green Energy Project at Gujarat by Powerica Limited” 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

Powerica Limited is a private entity having its registered office in India.

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

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

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

The Modalities of Communication has been signed by the project participant clearly stating the focal point in accordance with the “Procedures for modalities of communications between project participants and the executive board”, Version 01, (Annex 59 to 45th meeting of CDM-EB).

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 (Version 07) applicable to the validation.

A valid form of the CDM-PDD (Version 03) is used which is the current form 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 proposed project activity involves the installation of 25.2 MW wind power project consisting of 14 WTGs each of capacity 1.8 MW. The project site is located in the villages Jangi, Vandhiya, Godpar and Lakhdarghad in Bhachau Taluk Kutch district of Gujarat State in India.

The location details are provided in the below table.

Sno.	WTG No.	Village	Latitude	Longitude
1	JW1New	Jangi	23° 11' 54" N	70° 34' 54" E
2	JW29	Jangi	23° 12' 01" N	70° 32' 25" E
3	JW2New	Jangi	23° 11' 40" N	70° 34' 45" E
4	JW5New	Jangi	23° 11' 49" N	70° 35' 07" E
5	VW48	Lakhdarghad	23° 15' 23" N	70° 35' 17" E
6	VW49	Lakhdarghad	23° 12' 11" N	70° 36' 52" E
7	VW54New	Godpar	23° 12' 14" N	70° 36' 38" E
8	VW62	Vandhiya	23° 15' 45" N	70° 34' 56" E
9	VW63	Vandhiya	23° 15' 51" N	70° 35' 21" E
10	VW66	Vandhiya	23° 16' 03" N	70° 35' 06" E
11	VW67	Vandhiya	23° 15' 25" N	70° 35' 45" E
12	VW71 (Temp 1262)	Vandhiya	23° 13' 29" N	70° 36' 18" E
13	VW79 (Temp 382)	Vandhiya	23° 14' 46" N	70° 37' 40" E
14	VW80	Vandhiya	23° 12' 22" N	70° 35' 27" E

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.

The project description was validated by document review including interview with project site personnel of Vestas, review of the indicative proposal issued by Vestas and by physical verification of the proposed location based on site visit. The validation team confirmed the geographic coordinates of the WTGs during the site visit and confirmed the area geographic coordinates by further checking the same with the hand held GPS device.

Sustainable development

The project activity supports the sustainable development criteria of the host country. The validation team had reviewed the four indicators for sustainable development defined by Designated National CDM Authority (NCDMA) viz. – social, economic, environmental and technological well being. Justifications in the PDD with respect to each of these indicators were considered appropriate.

The host Party's DNA has 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 baseline scenario identified in the PDD has been assessed against the requirements in the approved methodology ACM0002, Version 13.0.0. The Version 13.0.0 is the latest available version of methodology.. 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.

Project boundary

According to the applied methodology, ACM0002, Version 13.0.0, the project boundary for the project activity includes the project power plant and all other power plants connected physically to the electricity system (NEWNE grid) that the CDM project power plant is connected to.

The project boundary has been validated through documentation review on Power Purchase Agreement and physical verification of the project site. This information was substantiated via cross-check with Grid emission factor calculations. 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.

Baseline identification

The baseline scenario identified in the PDD has been assessed against the requirements in the approved methodology ACM0002 Version 13.0.0. LRQA can confirm that the procedure included in this methodology to identify the most reasonable baseline scenario, has been correctly applied.

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

LRQA confirms that:

- All the assumptions and data used by the project participants are listed in the PDD, including their references and sources;
- All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;
- Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;
- Relevant national and/or sectoral policies and circumstances are considered and

- listed in the PDD;
- The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.

Algorithms and/or formula used to determine emission reductions

LRQA has confirmed that the steps taken and the equations applied to calculate project emissions, leakage, baseline emissions and emission reductions comply with the requirements of the approved methodology ACM0002, Version 13.0.0.

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

LRQA confirms that:

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

4.6 Additionality of a project activity

The project additionality was demonstrated by the PP through the “Tool for demonstration and assessment of additionality” (Version 06.1.0.)

Prior consideration of CDM

The start date considered for the project activity is 12/07/2011 as the date of placing the agreement for supply of wind turbine generators. LRQA has validated the start date is in accordance with Glossary of CDM terms version 07, through the review of erection and commissioning agreement, commissioning certificates and land documents.

The PDD was made publicly available for global stakeholders’ consultation process during the period 07/03/2012 to 05/04/2012 which is after the start date of the project activity. Further, the start date of the project activity is after 02/08/2008; therefore, in accordance with the “Guidelines on the demonstration and assessment of prior consideration of the CDM, Version 04”, the PP has informed the Host Party DNA and the UNFCCC secretariat on 29/04/2011, regarding the commencement of the project activity and 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 the subsequent confirmation message from the UNFCCC secretariat dated 09/06/2011 and the DNA on 10/05/2011.

The validation team had confirmed the name of the project activity in the list of notifications received by the UNFCCC available from the UNFCCC website¹. Thus, LRQA confirms that the CDM was seriously considered in the decision to implement the project. Therefore, the project activity complies with the requirements of the latest version of the Guidance on prior consideration of CDM available at the time of validation.

¹ <http://cdm.unfccc.int/Projects/PriorCDM/notifications/index.html>

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's business.

Investment analysis

Investment analysis is used for demonstration of the additionality.

In accordance to the Tool for the demonstration and assessment of additionality version 6.1.0, the benchmark analysis is selected out of the options for the analysis method as the project activity will produce economic return by electricity sales other than the CDM related revenue and the project owner has no other investment option to compare with. The assumptions/input values used for investment analysis have been validated.

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

The PP had presented the unprotected spreadsheet versions of the investment analysis, having readable formulae. LRQA could confirm that the investment analysis is presented in a transparent manner, to the extent that the reader can reproduce the results.

The PP has presented an Investment analysis for the 27 MW project capacities and for the short closed project capacity of the 25.2 MW. The Investment analysis presented for 27 MW considers the Input values applicable at the time of decision making. The PP also presented the Investment analysis for the short closed capacity of 25.2 MW considering the input value available to the PP at the time of note to the board members to reduce the capacity from 27 MW to 25.2 MW for the project. This was done to substantiate further that the financial unattractiveness for the project activity remains for the 25.2 MW capacities also.

For details about the validation of the parameters used in the financial calculations and assessment of the benchmark applied, please refer to the Validation protocol in Appendix F. LRQA confirms that the underlying assumptions for the investment analysis are appropriate and that the financial calculations are correct.

Common practice analysis

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

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 approved consolidated methodology ACM0002, Version 13.0.0. Version 13.0.0 of ACM0002 is the latest version of the methodology available.

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 08/08/2011 before the publication of the PDD on the UNFCCC website. The local stakeholder consultation meeting was held on 18/08/2011 in a school near the site office, Vandhiya-Kutch district and the following persons and entities attended this meeting.

Select List of attendees:

S. No.	Name of individual	Name of the organisation
1	Mr N Karuna Moorthy	Powerica Limited
2	Mr Qazi Syed Aamir	Powerica Limited
3	Mr S Parameswaran	Vestas Wind Technologies India Pvt Ltd
4	Mr Sumit Gupta	Powerica Limited
5	Mr Ramji GK	Powerica Limited
6	Mr RD Makwana	Primary school teacher, Vandhiya
7	Mr JG Kalariya	Primary school teacher, Vandhiya
8	Mr. BH Jadav	GETCO, Gujarat
9	Mr Fakir Mohmed Abdul	Local Villager
10	Mr Mukesh D	Local Villager
11	Mr Subir P Tedy	Local Villager
12	Mr Navin Barid	Local Villager
13	Mr Govind Gupta	Local Villager
14	Mr Rumi Ahir	Local Villager
15	Navin A Burid	Local Villager
16	Ahir Jhoda	Local Villager
17	KK Solanki	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.

4.9 Environmental impacts

LRQA, through review of the most current Environmental clearance regulations of the host country, confirmed that there is no requirement for carrying out any Environmental impact assessment.

LRQA confirms that no environmental clearance or an EIA study is required for this

project as evidenced from the EIA notification from Ministry of Environment & Forests (MoEF)². No adverse environmental impacts as well as trans-boundary impacts have been envisaged from the project activity.

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

4.10 Summary of Changes

Significant changes made to the original PDD published for Global Stakeholder Consultation Process are summarised below. The PDD Version 01 dated 30/01/2012 was modified and several changes occurred due to the result of validation process. The PDD Version 5 dated 24/01/2013 includes all these changes.

1. The applicability conditions as per the methodology in the Section B.2 are changed as a result of CAR-02
2. Beta Calculation and thus the Benchmark in section B.5 of the PDD is changed from 20.31% to 18.44% as a result of CAR-03,
3. The financial indicator used in the investment analysis is revised to “IRR” from “NPV” as a result of CAR-03
4. Common Practice Analysis in section B.5 of the PDD is changed as a result of CAR-04
5. Input parameters for investment analysis in section B.5 of the PDD is changed as a result of CL-01. Further, the investment analysis is revised to the one used at the time of investment decision.
6. The emission factor calculation in the Section B.6 of the PDD is changed from 0.9486 tCO₂/MWh to 0.9528 tCO₂/MWh as a result of CAR-05. The emission reduction changed from 66,971 tCO₂e per year to 61,360 tCO₂e.
7. The accuracy class of the measuring instruments and the monitoring plan revised in the Section B.7 of the PDD is changed as a result of CAR-06
8. The Applied consolidated methodology ACM0002, Version 12.3.0 has been amended to the latest version 13.0.0. The earlier used Version 12.3.0 of ACM0002 was valid to be submitted for request for registration until 11 Jan 2013 23:59:59 GMT.

A summary of changes in values in the web hosted PDD is provided below.

Item	Description	Value in PDD GSP	Value in PDD RfR	CAR/CL
1	Financial Indicator	NPV of (2,22.403) million INR	IRR of 11.10%	CAR-03
2	Emission Factor for the grid	0.9486 tCO ₂ /MWh	0.9528 tCO ₂ /MWh	CAR-05
3	Ex ante emission reductions per year	66,971 tCO ₂ e	61,360 tCO ₂ e	CAR-05
4	Benchmark	20.31%	18.44%	CAR-03

The above changes were to address the issues raised by the validation team during the validation process. For details about the results of the responses to CARs and CL, discussions on revisions to project documentation and the detailed changes to the

² <http://moef.nic.in/downloads/rules-and-regulations/3067.pdf>

PDD coming from the validation process, please refer to the Validation Findings Log in the Validation Protocol in Appendix.

5. Comments by parties, stakeholders and NGOs

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

The PDD was made publicly available in accordance with the requirements of the procedure for the period of 07/03/2012 to 05/04/2012 and the same was confirmed from the below web link:

<http://cdm.unfccc.int/Projects/Validation/DB/1OIYOW7HMO4LFBYY9MYCH2OK9GM2DU/view.html>

No comments were received during the period.

6 Validation Opinion

LRQA has undertaken the validation of the proposed project activity “Green Energy Project at Gujarat by Powerica Limited” 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 fourteen Wind Turbine Generators (WTGs) of capacity 1.8 MW each in the villages Jangi, Vandhiya, Godpar and Lakhdarghad in Bhachau Taluk, Kutch district in the state of Gujarat. Initially the project was conceptualised for 27 MW consisting of 15 WTGs of 1.8MW each, but during the final implementation of the project, only 14 of these 15 WTGs were installed due to unavailability of land at the project site. The electricity generated by the project activity will be supplied to the regional grid, i.e. the NEWNE Grid for Gujarat site. It will reduce the need for power generation from the conventional fossil fuel based power plants, thereby leading to reduction of GHG emissions. During the validation it is confirmed that:

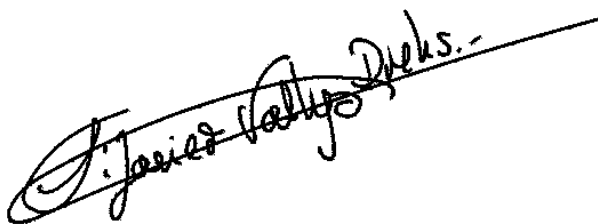
- The PP has correctly applied ACM0002 Version 13.0.0 to the project activity that involves electricity generation from wind turbines that supply electricity to an electricity distribution system.
- The NEWNE regional grid is the appropriate project electricity system considered for this CDM project activity.
- A combined margin grid emission factor of 0.9528 tCO₂e/MWh for NEWNE Grid has been validated based on the most recent CEA Database Version 7.0 available at the time of submission of the PDD. The data vintage selected is ex-ante.
- The PP was aware of CDM prior to the project start; benefits of CDM were seriously considered at the time of the investment decision.
- The validation team confirmed that the financial returns of the proposed project activity (without CDM benefits) would be insufficient to justify the required investment and hence the project activity is additional.
- The total emission reductions from the project are estimated to be on the average 61,360 tCO₂e per year over the 10 years fixed crediting period. The validation team confirmed that emission reduction forecast is reasonable if the underlying assumptions do not change.
- The monitoring plan has been suitably addressed and implementation of the plan by the PP is feasible within the project design.
- There is no significant environmental impact as a result of the project activity.
- The local stakeholder process was held in a clear and transparent manner and only positive comments were expressed. No negative comment was received during the local stakeholders’ consultation process.
- The project activity supports the sustainable development criteria of the host Party as evidenced by the Letter of Approval from the Host country’s DNA.

To arrive at the final validation conclusions and opinion, LRQA carried out a desk review of submitted project documentation, physical site assessment during a site visit and interview with relevant government official and technology provider. There was no project component or issues excluded from the validation.

Through the validation process, the validation team identified 6 CARs and 1 CL. The PP has taken action on the raised issues and submitted to LRQA the revised PDD and other supporting evidence.

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 61,360 tCO₂e/annum and contribute to the sustainable development of the host country. Therefore LRQA requests the registration of "Green Energy Project at Gujarat by Powerica Limited" to the CDM Executive Board as a CDM project activity.

Decision Maker



Javier Vallejo Drehs
CDM Quality Manager
31/01/2013

7 Appendices

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

Letter of Approval from the Ministry of Environment and Forests (MoEF), Government of India (Host Country DNA) No: 4/12/2012-CCC dated 10/10/2012

7.2 Appendix B: List of documents reviewed

Category A documents (documents prepared by the PP)

Ref No.	Title/Source / Organisation
1.	Project design document Version 01 dated 30/01/2012, Version 02 dated 25/07/2012, Version 03 dated 17/09/2012, Version 04 dated 27/11/2012 and Version 05 dated 24/01/2013.
2.	Investment Analysis spread sheet for the original investment decision Version 1.0 dated 30/01/2012, Version 2.0 dated 25/07/2012, Version 3.0 dated 17/09/2012, Version 4.0 dated 21/09/2012, Version 5.0 dated 27/11/2012 and Version 6.0 dated 10/12/2012
3.	Investment Analysis spread sheet for the short closed capacity Version 1.0 dated 30/01/2012, Version 2.0 dated 25/07/2012, Version 3.0 dated 17/09/2012, Version 4.0 dated 21/09/2012 and Version 5.0 dated 27/11/2012
4.	Emission reduction spreadsheet Version 1.0 dated 10/12/2012
5.	Certified true extract of board resolution of Powerica Limited dated 10/02/2011
6.	The note to board members dated 02/06/2011 seeking approval for short closure.
7.	Common Practice Analysis spreadsheet Version 2 dated 27/11/2012
8.	Type certificate DNV Vestas 1.8MW WTG with type certificate number IEC TC-224603-0 issued on 04/03/2011.
9.	Indicative Proposal for 18MW wind power project issued by Vestas Wind technology India Private Limited dated 25/01/2011
10.	Independent Energy Estimation by AWS Truepower,LLC dated 07/01/2011
11.	Supply agreement signed between Vestas and Powerica Limited dated 12/07/2011
12.	Erection & Commissioning contract signed between Vestas and Powerica Limited dated 12/07/2011.
13.	Service contract signed between Vestas and Powerica Limited dated 12/07/2011.
14.	Prior Consideration of the CDM Form dated 27/04/2011
15.	Copy of the email forwarded by PP to UNFCCC for the prior consideration of CDM dated 29/04/2011 & Copy of the acceptance mail from UNFCCC to PP dated 09/06/2011
16.	Copy of the mail forwarded by PP to host party DNA for the prior consideration of CDM dated 29/04/2011 & Copy of the acceptance mail from host party DNA to PP dated 10/05/2011
17.	Declaration from PP for not considering the Official Development Assistance (ODA) dated 01/12/2011
18.	Loan application letter dated 24/10/2011 and Loan Sanction Letter from Citibank to Powerica Limited dated 01/11/2011

19.	Land Sale deeds dated 27/11/2011 between Powerica Limited and Vestas Wind Technology India Private Limited (Vestas)
20.	Commissioning certificates for the WTGs dated 31/01/2012, 02/03/2012 and 14/03/2012
21.	Modalities of Communication dated 20/09/2012
22.	Company incorporation certificate reference number 11-32825 dated 05/10/1989 issued by the Office of Registrar of companies, Maharashtra, India.
23.	Power Purchase agreements between Powerica Limited and the Gujarat Urja Vikas Nigam Limited (GUVNL) dated 08/02/2012, 13/03/2012 and 20/03/2012
24.	Clearances from Gujarat Energy Development Agency (GEDA) dated 31/01/2012, 02/03/2012 and 14/03/2012
25.	Joint Meter Readings for the Vandiya site for the months July 2012 dated 01/08/2012 and August 2012 dated 01/09/2012
26.	RBI Forecast for Inflation rate considered in benchmark
27.	Personal Invitation letters sent on 08/08/2011 for the stakeholder meeting to be conducted on 18/08/2011
28.	Newspaper advertisement issued by Powerica Limited for stakeholder meeting in 'Kutch Mitra' newspaper on 30/07/2011.

Category B documents (other documents referenced)

1. ACM0002 Consolidated baseline methodology for grid-connected electricity generation from renewable sources, Version 13.0.0.
2. "Tool to calculate the emission factor for an electricity system" Version 02.2.1
3. CO₂ Baseline Database for the Indian Power Sector, User Guide Versions 7.0 & 6.0
4. Clean Development Mechanism Project design document form (CDM- PDD)
5. Guidelines for completing the Project Design Document (CDM-PDD) and the proposed new baseline and monitoring methodologies (CDM-SSC-NM) Version 07
6. Guidelines on the Assessment of Investment Analysis Version 05
7. Guidelines on the Demonstration and Assessment of prior consideration of the CDM (Version 04)
8. Guideline for the reporting and validation of plant load factors (Version 01)
9. Clean Development Mechanism Validation and Verification Manual version 1.2 (Annex 01, EB 55)
10. Eligibility Criteria for Host Country Approval, National CDM Authority, Ministry of Environment & Forests
11. Notification by Ministry of Environment & Forests dated 01/12/2009
12. Wind Power Directory – 2011
13. "Guidelines on Common Practice" Version 02.0
14. "Tool for demonstration and assessment of additionality" (Version 06.1.0)
15. Wind power density map (http://www.cwet.tn.nic.in/html/departments_wpdmap.html)
16. Manufacturers-wise wind electric generators installed in India (http://www.cwet.tn.nic.in/html/information_ml.html)

7.3 Appendix C: List of persons interviewed

S. No.	Name of individual	Name of the organisation
1	Mr S Parameswaran	Vestas Wind Technologies India Pvt Ltd
2	Mr Senthil	Vestas Wind Technologies India Pvt Ltd
3	Mr Gohel. Dipak.H	Engineer, Vestas Wind technologies
4	Mr BH Jadav	Deputy Engineer, GETCO
5	Mr JG Kalariya	Primary school Teacher
6	Mr. RD Makwana	Primary school Teacher
7	Mr Govind Gupta	Local Villager
8	Mr Dinesh Muraj	Local Villager
9	Mr. Babu Lal	Local villager
10	Mr. Dawood Umar	Local villager
11	Mr Karuna Moorthy	Powerica Limited
12	Mr Qazi Syed Aamir	Powerica Limited

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 procedure for the period of 07/03/2012 to 05/04/2012 and the same was confirmed from the below web link:

<http://cdm.unfccc.int/Projects/Validation/DB/1OIYOW7HMO4LFBYY9MYCH2OK9GM2DU/view.html>

No comments were received during the period.

7.5 Appendix E: Certificate of Appointment

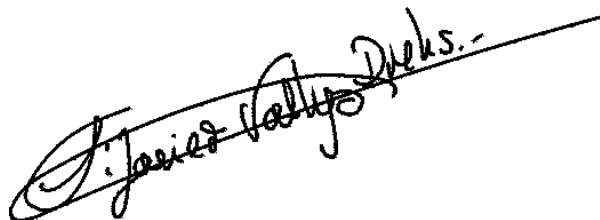
Validation of “Green Energy Project at Gujarat by Powerica Limited”

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

Name of Person	Assigned Roles
Ankush Jain	Team Leader, Sector Expert
Syju Alias	Team Member,
Ajesh Kumar	Technical Reviewer, Sector Expert
Andrew Ritchie	Decision Maker
Javier Vallejo Drehs	Decision Maker

Signed by

Decision Maker



Javier Vallejo Drehs
CDM Quality Manager
31/01/2013

7.6 Appendix F: Validation Protocol and findings log

	Validated situation	Conclusion
SECTION 1. Approval		
Host Country Approval		
1. Has the Host country DNA provided a written approval?	Yes ☒ No ☐ NA ☐ ³ The name of the PP as per the PDD is “Powerica Limited” and the title of the project is “Green Energy Project at Gujarat by Powerica Limited”. The Host country DNA, Ministry of Environment and Forests, India has given the written approval vide letter ref no 4/12/2012-CCC dated 10/10/2012 for the project “Green Energy Project at Gujarat by Powerica Limited”. Initially the PP had not presented the copy of the LoA and the CAR-01 was raised. The PP submitted the Host country approval for the project titled “Green Energy Project at Gujarat by Powerica Limited” for M/s Powerica Limited and clarified that Messrs (M/s) ⁴ is a commonly used salutation for companies. The name of PP was confirmed as “Powerica Limited” from the review of the incorporation certificate dated 05/10/1989. The team also reviewed the LoAs issued in the name “M/s Powerica Limited” for registered projects (ref numbers 3632, 3327 and 4572) along with the names indicated in the corresponding PDDs. The team also reviewed various other LoAs issued by the host country DNA and compared it with their project details in UNFCCC website and the host country DNA website and confirmed that prefixing the company name with “M/s” is very common in the letter of approval. One such approval ⁵ (UNFCCC number 6390) is provided for reference. Hence the team confirm that the name given in the LoA is different only because of the inclusion of the salutation “M/s” in front of the PP name and the finding is closed. The detail of the resolution is given in the findings section of the report.	CAR-01 OK
2. Confirm that the letter has been issued by the Party’s DNA and is valid for the proposed CDM	Yes ☒ No ☐ NA ☐ The Host country DNA for India is Ministry of Environment and Forests (MoEF). The Validation team confirms that Host country DNA for India has given the written	OK

³For each section and question where a YES / NO / NA answer is required, explain your choice.

⁴<http://oxforddictionaries.com/definition/english/Messrs>

⁵http://www.cdmindia.gov.in/project_details_view.php?id=595&oid=1&page=5&reporttype=1

project activity under validation	approval vide letter ref no 4/12/2012-CCC dated 10/10/2012 to Powerica Limited for the project "Green Energy Project at Gujarat by Powerica Limited"	
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 validation team compared the letter from host country DNA with that of other similar projects and found it to be appropriate.	OK
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 validation team has reviewed and confirm that the Letter of approval from the host country DNA confirms that a) Government of India has ratified the Kyoto Protocol in August 2002 b) The participation in the project is voluntary c) The proposed project activity contributes to sustainable development in India d) The approval is for the project titled "Green Energy Project at Gujarat by Powerica Limited"	OK
5. Is the letter of approval unconditional with respect of (a) to (d) above?	Yes ☒ No ☐ NA ☐ The Letter of Approval is unconditional with respect to the above section 4 (a) to 4 (d) a) the ratification of the Kyoto protocol by the party, b) voluntary participation, c) contribution to sustainable development of the country and d) the precise title of the project	OK
6. Does the LoA from the host party acknowledge the bundle activity (if applicable)?	Yes ☐ No ☐ NA ☒ The project is a normal scale wind power project and is not a bundled project activity. Hence not applicable	OK
Annex I Party Approval		
7. Has the Annex I country DNA provided a written approval?	Yes ☐ No ☐ NA ☒ Not applicable since Annex 1 Party has not been identified in the project activity as confirmed from the Section A.3. In accordance with the 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.	OK
8. Confirm that the letter has been issued by the	Yes ☐ No ☐ NA ☒	OK

Party's DNA and is valid for the proposed CDM project activity under validation.	Not applicable as no Annex 1 party is involved in the project	
9. Mention the means of validation employed to assess the authenticity of the Letter of Approval. Indicate the source of the LoA (for example, PP or directly from the DNA).	Not applicable as no Annex 1 party is involved in the project	OK
10. Does the written Letter of Approval confirm the following: (a) The Party is a Party to the Kyoto Protocol (including ratification)? (b) Participation is voluntary? (c) It refers to the precise proposed CDM project activity title in the PDD being submitted for registration?	Yes ☐ No ☐ NA ☒ Not applicable as no Annex 1 party is involved in the project	OK
11. Is the letter of approval unconditional with respect of (a) to (c) above?	Yes ☐ No ☐ NA ☒ Not applicable as no Annex 1 party is involved in the project	OK
Host Country and Annex I Party Approval		
12. Do any of the Letters of Approval contain additional specification of the project activity? Like: - PDD Version number? - Validation report version number? Make sure that the request for registration is made on the basis of the documents specified in any of the letters.	The LoA from the host country dated 10/10/2012 does not refer to any version numbers of the PDD or validation report.	

	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	Powerica Limited	OK
	Host Party PP name in PDD/ Annex 1	Powerica Limited	
	Host Party PP name in MoC	Powerica Limited	
	Annex 1 Party PP name in PDD/ A.3	Not Applicable	

	Annex 1 Party PP name in PDD/ Annex 1	Not Applicable	
	Annex 1 Party PP name in MoC	Not Applicable	
2	Confirm that each of the PPs has been approved by at least one Party involved.	Yes ☒ No ☐ NA ☐ The only PP in the project is Powerica Limited and they are approved by Host country DNA, India. Please refer the section above for the validation of LoA.	CAR-01 OK
3	Confirm that no entities other than those approved as PPs are included in section A.3 of PDD.	Yes ☒ No ☐ NA ☐ No entities other than those provided as PPs are included in the section A.3 of 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 approval of participation has been stated in the approval letter by the host country DNA, Ministry of Environment and Forests.	OK
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 20/09/2012 was submitted by the PP - Powerica Limited is the sole focal point and the information is filled in accordance with the MoC form F-CDM-MOC, Version 1.4 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 ☐ The project is a Normal scale wind power project	OK
2. Has the PDD used the latest template and guidance from the CDM Executive Board available on the UNFCCC CDM Website? Check outputs from the completeness check.	Yes ☒ No ☐ Guideline for completing the simplified project design document (CDM-PDD) Version 7, EB41, Annex 12 and PDD Format Version 03, EB25, Annex 15 which are the current versions available in UNFCCC CDM website The completeness check was done on 06/03/2012 and there were no corrections required to be made in the PDD submitted by the PP.	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.	The project activity is the installation of a 25.2 MW wind power project (14 units of Vestas make 1.8 MW V100 WTGs) in the villages Jangi, Vandhiya, Godpar and Lakhdarghad in Bhachau Taluk, in Kutch district of Gujarat state in India. Initially the project was conceptualised for 27 MW consisting of 15 WTGs of 1.8MW each, but during the final implementation of the project, only 14 of these 15 WTGs were installed due to unavailability of land at the project site. The project is annually expected to export 64,400 MWh electricity which otherwise would have been generated through alternate fuels (most likely - fossil fuel) based power plants, contributing to reduction in specific emissions (emissions of pollutant) including GHG emissions. The proposed project activity would contribute an estimated GHG reduction of 613,600 tCO₂e over a crediting period of 10 years. The electricity generated by the project activity will be supplied to the NEWNE grid system. The electrical energy produced by the project activity will be measured using electronic tri-vector bi-directional electricity meters. During the process of validation, LRQA confirmed the capacity, unique identification of the project activity, estimated power generation, arrangement for	OK

	evacuation of electricity generated, technical specifications, the date of commissioning and necessary clearances for setting the project activity. The list of documents reviewed during the course of the validation is presented under Appendix B. The technical details with respect of the WTG provided in the PDD were confirmed with technical brochures⁶ and quotation from Vestas Wind Technology India Private Limited dated 25/01/2012. 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 technical details of the 1.8MW Wind turbine generators is as below <table><tr><td>Lifetime</td><td>20 years</td></tr><tr><td>Rated Power</td><td>1,800 kW</td></tr><tr><td>Rotor diameter</td><td>100 metre</td></tr><tr><td>Swept area</td><td>7,850 square metres</td></tr><tr><td>No. of blades</td><td>3</td></tr><tr><td>Cut in wind speed</td><td>4 metre/second</td></tr><tr><td>Cut out wind Speed</td><td>20 metre/second</td></tr><tr><td>Rotor Speed</td><td>14.5 rotations per minute</td></tr><tr><td>Generator Type</td><td>Asynchronous with wound rotor, slip rings</td></tr><tr><td>Operating Temperature Range</td><td>-20⁰C to 40⁰C</td></tr></table> The team has cross-checked the wind study report by a third party, AWS Truepower, LLC dated 07/01/2011. The team confirm that the WTGs specified in this report and the proposed project are the same after review of the specified locations and the identification numbers for the WTGs in the third party report. The report specifies a lower estimate of electricity generation than that in the quotation provided by the technology supplier, Vestas Wind Technology India Private Limited. The PP has considered the higher generation value for the	Lifetime	20 years	Rated Power	1,800 kW	Rotor diameter	100 metre	Swept area	7,850 square metres	No. of blades	3	Cut in wind speed	4 metre/second	Cut out wind Speed	20 metre/second	Rotor Speed	14.5 rotations per minute	Generator Type	Asynchronous with wound rotor, slip rings	Operating Temperature Range	-20 ⁰ C to 40 ⁰ C	
Lifetime	20 years																					
Rated Power	1,800 kW																					
Rotor diameter	100 metre																					
Swept area	7,850 square metres																					
No. of blades	3																					
Cut in wind speed	4 metre/second																					
Cut out wind Speed	20 metre/second																					
Rotor Speed	14.5 rotations per minute																					
Generator Type	Asynchronous with wound rotor, slip rings																					
Operating Temperature Range	-20 ⁰ C to 40 ⁰ C																					

⁶ <http://www.vestas.com/en/wind-power-plants/procurement/turbine-overview/v100-1.8-mw.aspx#/vestas-univers>

	investment analysis and lower generation value for the emission reduction calculation as a conservative measure. PP had undertaken the wind study and the quotation from technology supplier for 15 WTGs of capacity 1.8MW each. Out of the 15 WTGs for which the quotation was taken, PP has installed 14 WTGs. The team confirms that the all the 14 WTGs installed are part of the 15 WTGs indicated in the quotation by review of the locations specified in the documents. The Project details given in the PDD have been confirmed by the validation team during the site visit and the review of the following documents 1. PP's Agreements with Vestas for Supply, Erection & Commissioning and Service availability dated 12/07/2011 2. The copy of approvals from Gujarat Energy Development Authority (GEDA) dated 31/01/2012, 02/03/2012 and 14/03/2012 3. Power purchase agreements with Gujarat Urja Vikas Nigam Limited (GUVNL) dated 08/02/2012, 13/03/2012 and 20/03/2012 4. The quotation by Vestas dated 25/01/2011 The description of the project activity was validated by the team based on review of the records and supporting documents, physical site visit and field interviews that included the overall design document, technical specification, estimation of electricity generation by the technology supplier, and the PPA.																																	
2. Confirm that the exact project location is provided in the PDD with Geographical coordinates, check the accuracy of them and the format of the notation (Grades, minutes, seconds or decimal indicating latitude N or S and Longitude E or W) Please include here the Geographical coordinates:	Yes; the project site is located in the villages Jangi, Vandhiya, Godpar and Lakhdarghad in Bhachau Taluk, Kutch district in Kutch district of Gujarat State in India. The exact project locations for the 14 Wind turbine generators are as below. <table><tr><th>Sno.</th><th>WTG No.</th><th>Latitude</th><th>Longitude</th></tr><tr><td>1</td><td>JW1New</td><td>23° 11' 54" N</td><td>70° 34' 54" E</td></tr><tr><td>2</td><td>JW29</td><td>23° 12' 01" N</td><td>70° 32' 25" E</td></tr><tr><td>3</td><td>JW2New</td><td>23° 11' 40" N</td><td>70° 34' 45" E</td></tr><tr><td>4</td><td>JW5New</td><td>23° 11' 49" N</td><td>70° 35' 07" E</td></tr><tr><td>5</td><td>VW48</td><td>23° 15' 23" N</td><td>70° 35' 17" E</td></tr><tr><td>6</td><td>VW49</td><td>23° 12' 11" N</td><td>70° 36' 52" E</td></tr><tr><td>7</td><td>VW54New</td><td>23° 12' 14" N</td><td>70° 36' 38" E</td></tr></table>	Sno.	WTG No.	Latitude	Longitude	1	JW1New	23° 11' 54" N	70° 34' 54" E	2	JW29	23° 12' 01" N	70° 32' 25" E	3	JW2New	23° 11' 40" N	70° 34' 45" E	4	JW5New	23° 11' 49" N	70° 35' 07" E	5	VW48	23° 15' 23" N	70° 35' 17" E	6	VW49	23° 12' 11" N	70° 36' 52" E	7	VW54New	23° 12' 14" N	70° 36' 38" E	OK
Sno.	WTG No.	Latitude	Longitude																															
1	JW1New	23° 11' 54" N	70° 34' 54" E																															
2	JW29	23° 12' 01" N	70° 32' 25" E																															
3	JW2New	23° 11' 40" N	70° 34' 45" E																															
4	JW5New	23° 11' 49" N	70° 35' 07" E																															
5	VW48	23° 15' 23" N	70° 35' 17" E																															
6	VW49	23° 12' 11" N	70° 36' 52" E																															
7	VW54New	23° 12' 14" N	70° 36' 38" E																															

	8	VW62	23° 15' 45" N	70° 34' 56" E	
	9	VW63	23° 15' 51" N	70° 35' 21" E	
	10	VW66	23° 16' 03" N	70° 35' 06" E	
	11	VW67	23° 15' 25" N	70° 35' 45" E	
	12	VW71 (Temp 1262)	23° 13' 29" N	70° 36' 18" E	
	13	VW79 (Temp 382)	23° 14' 46" N	70° 37' 40" E	
	14	VW80	23° 12' 22" N	70° 35' 27" E	
	The validation team confirmed the location of the project activity at Kutch district of Gujarat during the site visit. The area geographic coordinates were confirmed using hand held GPS unit during the site visit. Out of the 15 WTGs for which the quotation was taken, the PP installed 14 WTGs. The team confirms that all the 14 WTGs installed are part of the 15 WTGs indicated in the quotation by review of the locations specified in the documents. The team confirmed the locations of the 14 WTGs through the review of the following documents • The prior consideration form sent to UNFCCC dated 27/04/2011 • PP's Agreements with Vestas for Supply, Erection & Commissioning and Service availability dated 12/07/2011 and • The copy of approvals from Gujarat Energy Development Authority (GEDA) dated 31/01/2012, 02/03/2012 and 14/03/2012 • Power purchase agreements with Gujarat Urja Vikas Nigam Limited (GUVNL) dated 08/02/2012, 13/03/2012 and 20/03/2012				
3. Confirm that the physical site inspection reflects the description in the PDD of the proposed CDM project activity.	The site visit was done on 16/04/2012 and 18/04/2012; the team confirms that the project description in the PDD is in agreement with the observations made and the interaction with local villagers, State utility officials and the employees of the technology service provider.				OK
4. If the team did not undertake a physical site inspection, describe the justification as approved by the CDM Quality Manager. (VVM 01.2: 60-61) Describe briefly the physical site inspection: Travel details and installations, facilities and buildings visited.	The site visit was done on 16/04/2012 and 18/04/2012. Site visit conducted on 16/04/2012 includes inspection of substation, grid interconnection point, metering location, WTG installation and meetings with local stakeholders. The PP's office located in Mumbai, Maharashtra was visited by the team on 18/04/2012 for top management interaction.				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
	Not Applicable	Not Applicable The project activity is a Greenfield activity (installation of wind turbine generators which will offset the electricity generated using fossil fuel intensive processes).	
6. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance (ODA).	The validation team confirmed from the interaction during the visit at corporate office of the PP that the project does not involve diversion of ODA. The PP has provided a declaration dated 01/12/2011 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.	The project is a normal scale project and hence not applicable		OK

	Validated situation	Conclusion
SECTION 5. Baseline and monitoring methodology		
1. Have the baseline and monitoring methodologies selected by the project participants been previously approved by the CDM Executive Board, that is, does it appear on the methodologies page of the UNFCCC website?	Yes ☒ No ☐ NA ☐ The project uses ACM0002, version 13.0.0 for renewable energy projects in the normal scale capacity. Version 13.0.0 of ACM0002 is the latest version. The methodology is available in the UNFCCC website under the methodologies section. http://cdm.unfccc.int/methodologies/PAmethodologies/approved	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.	The project is a normal scale project and hence not applicable	OK

	Validated situation	Conclusion
3. If the project activity is a Small Scale one; which approved small scale methodology does the project apply? Confirm that the SSC methodology is applied with the general guidelines to SSC CDM methodologies.	The project is a normal scale project and hence not applicable	OK
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 project activity applies ACM0002, Version 13.0.0 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”. This version of the methodology is the latest version available in the UNFCCC website. The methodology also refers to “Tool to calculate the emission factor for an electricity system”, Version 02.2.1, “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion”, Version 02 and “Tool for the demonstration and assessment of additionality”, Version 06.1.0. The latest version of the additionality tool is Version 07.0.0. The PP has applied additionality tool Version 06.1.0 which is valid for seeking registration by 22/07/2013 23:59:59 GMT. The latest version of the grid emission factor tool is Version 03.0.0. The PP has applied grid emission factor tool Version 02.2.1 which is valid for seeking registration by 22/07/2013 23:59:59 GMT. CAR-02 was raised since the applicability conditions of the applied tool were not presented and justified in the PDD. The PP revised section B.2 of the PDD in line with the tool and hence the finding was closed. The applicability criterion for the methodology is given in the following table.	~~CAR-02~~ Closed OK

No.	Applicability conditions in the ACM0002, Version 13.0.0	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 (green field 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 is a grid-connected wind power project of 25.2 MW capacity in Gujarat and is a Greenfield project activity.	Validation team confirmed the project is new grid connected power plant from the review of purchase orders, PPA and through site visit assessment. The team confirmed that the condition is applicable to the project activity.	OK

2	The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types: hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit;	The project activity is the installation of 25.2 MW wind energy based power plant in Gujarat.	Validation team confirmed the project is new grid connected power plant. The team confirmed that the condition is applicable to the project activity.	OK
3	In the case of capacity additions, retrofits or replacements (except for wind, solar, wave or tidal power capacity addition projects which use Option 2: on page 10 to calculate the parameter $EG_{PJ,y}$): the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity;	The project activity is a Greenfield setup and does not involve capacity additions, retrofits or replacements.	Validation team confirmed the project is new grid connected power plant and not capacity addition, retrofits or replacement and hence this condition is not applicable to the project activity.	OK
4	In case of hydro power plants: • The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of 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 (installed power generation capacity divided by the surface area at full reservoir level) of each reservoir, is greater than 4 W/m^2; or • The project activity results in new single or multiple reservoirs and the power density of each reservoir is greater than 4 W/m^2	This is not a hydro power project. Hence, this applicability criterion is irrelevant.	The proposed project is a wind power project and not a hydro power project. The team confirmed that the condition is not applicable to the project activity.	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/m^2 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/m^2; • Multiple reservoirs and hydro power plants located at the same river and where are designed together to function as an integrated project that collectively constitute the	This is not a hydro power project. Hence, this applicability criterion is irrelevant.	The proposed project is a wind power project and not a hydropower project. The team confirmed that the condition is not applicable to the project activity	OK

	generation capacity of the combined power plant; - Water flow between 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 15MW; - The total installed capacity of the power units, which are driven using water from reservoirs with power density lower than 4 W/m^2, is less than 10% of the total installed capacity of the project activity from multiple reservoirs.			
6	The methodology is not applicable to 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	The wind-mills are being newly installed at the project sites Hence there is no fuel-switch from fossil fuel to renewable energy source in the proposed project activity..	The project activity is a wind power project and does not involve fuel switching from fossil fuel to renewable sources. The team confirmed that the condition is not applicable to the project activity.	OK
7	The methodology is not applicable to the biomass fired power plants	. Not relevant to the proposed wind project activity	The project is not a biomass fired power plant. The team confirmed that the condition is not applicable to the project activity.	OK
8	The methodology is not applicable to a hydro power plant that results in the creation of a new single reservoir or in the increase in an existing single reservoir where the power density of the reservoir is less than 4 W/m^2 .	Not relevant to the proposed wind project activity	The project is not a hydro power project. . The team confirmed that the condition is not applicable to the project activity.	OK
9	In the case of retrofits, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is the continuation of the current situation, i.e. to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance".	This is a Greenfield project activity and is not a retrofit, replacement or a capacity addition. Thus, this applicability condition is irrelevant.	Validation team confirmed that the project is new grid connected wind power plant and not a retrofit, replacement or a capacity addition. The condition is not applicable to the project activity.	OK
Sr. No.	Applicability Conditions as per "Tool to calculate the emission factor for an electricity system"	Applicability to this Project Activity	Steps taken to assess the information	
1	This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that	The project activity is the installation of 25.2 MW wind energy based power	The proposed project exports electricity to NEWNE grid and as	OK

	substitutes grid electricity, i.e. where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).	plant in Gujarat. The electricity generated is supplied to the regional grid (NEWNE Grid). Thus, the project displaces the electricity grid which is essentially fossil-fuel based. Hence, this applicability condition is met.	per the methodology, the baseline scenario is the grid electricity. Hence the team confirm that the "Tool to calculate the emission factor for an electricity system" is applicable. The latest version of the tool is Version 03.0.0. The PP has applied grid emission factor tool Version 02.2.1, that is valid for seeking registration by 22/07/2013 23:59:59 GMT.	
2.	In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	This project activity is completely located in India which is a non-Annex I country. Hence, this tool for the calculation of emission factor for the electricity system can be applied to this project activity	The validation team confirmed that the project activity is completely located in India which is a non-Annex I country from the review of purchase orders, PPA and interaction during site visit.	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 methodology sets the clear criteria to check the applicability conditions and each condition is 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.	The team confirmed that no such issues have been identified.	OK
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.	The team confirmed that no such issues have been identified.	OK
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.	Since the project is a wind power project as per the PDD, there are no other emissions in the project boundary. 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 13.0.0. This is in accordance with paragraph 77 of CDM VVM (Version 01.2).	OK

	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 ☐ As per the Approved consolidated baseline and monitoring methodology ACM0002, the project boundary is "The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to." The project activity involves 14 WTGs and the electricity generated is evacuated through the 33kV substation at Vandhiya which is connected to the NEWNE Grid. It also includes the Grid which represents the entire electricity system and all the power plants connected to it apart from the project activity.	OK
2. Confirm that all sources and GHGs required by the methodology have been included within the project boundary. Describe here if any emission source that will be affected by the project activity and is not addressed by the approved methodology, has been identified. In such case request clarification of, revision to or deviation from the methodology in accordance with EB guidance. Use the table below for this purpose:	The project activity is a Greenfield wind power project and hence, only CO₂ is the relevant emission gas. The approved methodology ACM0002, Version 13.0.0 also confirms that only CO₂ is to be considered. The validation has determined that the delineation of the project boundary in the revised PDD is correct and meets the requirements of the applicable methodology. All sources and GHGs as required by the methodology have now been included in the project boundary. There is no emission source that is affected and not considered by the project activity and not addressed by the methodology.	OK

Gases and Sources Included In The Project Boundary						
	Source	Gas	Inc./Exc. Pdd	Justification PDD	Steps Taken To Assess PDD Justification	Conclusion
BAS ELIN	CO ₂ emissions from electricity generation in fossil fuel fired power	CO ₂	Yes	Main emission source	As CO ₂ is the main emission source, hence inclusion of this gas in project boundary is appropriate.	OK

PROJECT	plants that is displaced due to the project activity	CH ₄	No	Minor emission source	CH ₄ emissions would be minor in nature. Hence it is appropriate to exclude this gas.	OK
		N ₂ O	No	Minor emission source	N ₂ O emissions would be minor in nature. Hence it is appropriate to exclude this gas.	OK
	For geothermal power plants, fugitive emissions of CH ₄ and CO ₂ from non-condensable gases contained in geothermal steam.	CO ₂	No	The present project activity is a Greenfield wind power project. Hence, not relevant	Validation team confirmed from the site visit that the project activity is wind power project. Therefore, this emission source is not applicable for the project activity.	NA
		CH ₄	No			NA
		N ₂ O	No			NA
	CO ₂ emissions from combustion of fossil fuels for electricity generation in solar thermal power plants and geothermal power plants	CO ₂	No	The present project activity is a Greenfield wind power project. Hence, not relevant	Validation team confirmed from site visit and its sectoral expertise that there will be no fossil fuel consumption by the project plant.	NA
		CH ₄	No		The project is not a solar thermal or geothermal power plant	NA
		N ₂ O	No		The project is not a solar thermal or geothermal power plant	NA
	For hydro power plants, emissions of CH ₄ from the reservoir.	CO ₂	No	The present project activity is a Greenfield wind power project. Hence, not relevant	The project is not a hydro power plant	NA
		CH ₄	No		The project is not a hydro power plant	NA
		N ₂ O	No		The project is not a hydro power plant	NA

	Validated situation	Conclusion
SECTION 5b. Baseline identification		
1. Determine whether the PDD provides a verifiable description of the identified baseline scenario, including a description of the technology that would be employed and/or the activities that would take place in the absence of the proposed CDM project activity.	The project activity is the installation of a new wind power plant. This project is not a modification/ retrofit of any existing electricity generation facility. As per the approved methodology ACM0002, version 13.0.0, the baseline scenario is "Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the tool to calculate the emission factor for an electricity system	OK
2. Confirm that any procedure contained in the methodology to identify the most reasonable baseline scenario, has been correctly applied.	Yes ☒ No ☐ NA ☐ The PP has chosen the most reasonable baseline as per the methodology ACM0002, Version 13.0.0, i.e. the carbon emissions for the electricity generated by the grid in absence of the project activity. The PDD correctly applied this scenario to the project activity. Since this baseline scenario is prescribed/predefined 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, that is, such as the tool for the demonstration and assessment of additionality and the combined tool to identify the baseline scenario and demonstrate additionality, the guidance in the methodology shall supersede it in the tool.)	The applied methodology ACM0002, Version 13.0.0 prescribes the baseline. Therefore, no further analysis was done in accordance with paragraph 105 of the VVM ver. 01.2.	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:	The applied methodology ACM0002, Version 13.0.0 prescribes the baseline. Therefore, no further analysis was done in accordance with paragraph 105 of the VVM ver. 01.2.	OK
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.	As per the approved methodology ACM0002, version 13.0.0, the baseline scenario is "Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the tool to calculate the emission factor for an electricity system The validation team confirm that the baseline scenario identified in the PDD is reasonable, the documents and sources referred to in the PDD are correctly quoted.	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.	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 ACM0002, Version 13.0.0, this is not applicable.	OK

	Validated situation	Conclusion
SECTION 5c. Algorithms and/or formulae used to determine emission reductions		
1. Compare the equations and parameters in the PDD to those in the selected approved methodology and determine if they have been correctly applied to calculate project emissions, baseline emissions, leakage, and emission reductions. Confirm that adequate justification has been provided for selection between different options.	Emission reductions As provided in the methodology, emission reduction is calculated from the equation: $ER_y = BE_y - PE_y$ BE_y: Baseline emissions in the year y (tCO₂e/y) PE_y: Project emissions in the year y (tCO₂e/y) ER_y: Emission Reductions in the year y (tCO₂e/y) Project emissions (PE_y) As per the applicable methodology ACM0002, Version 13.0.0, the project emission is to be calculated as below $PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$ Where: PE_y = Project emissions in year y (tCO₂e) $PE_{FF,y}$ = Project emissions from fossil fuel consumption in year y (tCO₂e) $PE_{GP,y}$ = Project emissions from the operation of geothermal power plants due to the release of non-condensable gases in year y (tCO₂e) $PE_{HP,y}$ = Project emissions from reservoirs of hydro power plants in year y (tCO₂e) There is no fossil fuel consumption in the project activity and the project activity is not a geothermal power plants or hydro power plant. Hence, the PP has not considered the project emissions and is considered zero, $PE_y = 0$. Leakage The methodology states that “No leakage emissions are considered. The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, transport). These emissions sources are neglected”. Hence as per the methodology ACM0002, Version 13.0.0, the leakage is not considered in the project activity As no project emission (PE_y) or leakage is considered for the project activity, the estimated baseline emission (BE_y) becomes the emission reduction (ER_y), i.e;	CAR-05 Closed

	Validated situation	Conclusion
	$ER_y = BE_y$ Baseline emissions According to the applied methodology, 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. $BE_y = EG_{PJ,y} \cdot EF_{grid,CM,y}$ Where: BE_y = Baseline emissions in year y (tCO₂e) $EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh) $EF_{grid,CM,y}$ = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the tool to calculate the emission factor for an electricity system. (tCO₂/MWh) 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, $EG_{PJ,y} = EG_{facility,y}$ Where: $EG_{PJ,y}$ = 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) $EG_{facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh). Hence the baseline emissions, $BE_y = EG_{facility,y} \times EF_{grid,CM,y}$ Calculation of the emission factor The baseline emission factor is calculated as a Combined Margin (CM) consisting of Operating Margin (OM) and Build Margin (BM) factors based on data from an official source publicly available. The CM emission factor (EF) for the displaced electricity was calculated based on the 'Tool to calculate the emission factor for an electricity system' Version 02.2.1 (hereinafter referred to as "the tool"), in accordance with the	

	Validated situation	Conclusion
	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 7.0 has been applied as it was current at the time of submission of the CDM-SSC PDD for validation. CAR-05 was raised since the Ex-ante emission factor of Operating Margin emission factor did not use the latest database published at the time of submission of PDD for validation. Further, the notations of the parameters used in the emission factor calculation were not in agreement with the methodology. The PP revised the PDD and the finding was closed. The step wise estimation of $EF_{grid, OM, y}$ 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 Western region, the selection of the NEWNE 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	

	Validated situation	Conclusion																								
	resources constitute less than 50% of total grid generation on average of the five most recent years, i.e. from 2006-07 to 2010-11. <table><tr><th>Year</th><th>Low-cost/must-run resources of net generation</th></tr><tr><td>2006-07</td><td>18.46%</td></tr><tr><td>2007-08</td><td>19.04%</td></tr><tr><td>2008-09</td><td>17.41%</td></tr><tr><td>2009-10</td><td>15.94%</td></tr><tr><td>2010-11</td><td>17.64%</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. The PP has chosen the ex-ante option for determining the OM. This choice of ex-ante option which is based on a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation, was found acceptable in view of the availability of the requisite data vintages. 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 last three years for the NEWNE Grid and arrived at the following summary: The calculation used in the ER sheet to arrive at $EF_{grid, OM,y}$ <table><tr><th>Year</th><th>Simple Margin (tCO₂e /MWh)</th><th>Net generation (including imports) (GWh)</th></tr><tr><td>2008-09</td><td>1.0066</td><td>427,700</td></tr><tr><td>2009-10</td><td>0.9777</td><td>463,384</td></tr><tr><td>2010-11</td><td>0.9797</td><td>482,597</td></tr></table> The weighted average value to arrive at the Operating Margin (OM)	Year	Low-cost/must-run resources of net generation	2006-07	18.46%	2007-08	19.04%	2008-09	17.41%	2009-10	15.94%	2010-11	17.64%	Year	Simple Margin (tCO ₂ e /MWh)	Net generation (including imports) (GWh)	2008-09	1.0066	427,700	2009-10	0.9777	463,384	2010-11	0.9797	482,597	
Year	Low-cost/must-run resources of net generation																									
2006-07	18.46%																									
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2010-11	0.9797	482,597																								

	Validated situation	Conclusion																				
	$= \frac{\{(1.0066 \times 427,700) + (0.9777 \times 463,384) + (0.9797 \times 482,597)\}}{(427,700 + 463,384 + 482,597)}$ $EF_{grid, OM, y} = 0.9842 \text{ tCO}_2\text{e/MWh}$ The Operating Margin (OM) is cross-checked from the weighted average of Absolute emissions (including imports) and the Net generation (including imports) given in the CEA database, Version 7. The team confirm that the operating margin is calculated appropriately <table><tr><th>Year</th><th>Absolute emissions (including imports) (tCO₂)</th><th>Net generation (including imports) (GWh)</th></tr><tr><td>2008-09</td><td>430,502,442</td><td>427,700</td></tr><tr><td>2009-10</td><td>453,067,520</td><td>463,384</td></tr><tr><td>2010-11</td><td>468,438,871</td><td>482,597</td></tr></table> $EF_{grid OM, y} = (430,502,442 + 453,067,520 + 468,438,871) / (427,700 + 463,384 + 482,597) \times 1000$ $= 0.9842 \text{ tCO}_2\text{/MWh}$ Step 5 of the <i>tool</i> requires calculation of the build margin emission factor. The CEA database provides a BM value for the NEWNE grid as 0.8588. As part of validation of Step 5 of the tool, LRQA confirmed the BM for the year 2010-11 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>2010-11</td><td>101,146,601</td><td>117,779</td><td>0.8588</td></tr></table>	Year	Absolute emissions (including imports) (tCO ₂)	Net generation (including imports) (GWh)	2008-09	430,502,442	427,700	2009-10	453,067,520	463,384	2010-11	468,438,871	482,597	Year	Absolute emissions (tCO ₂)	Net Generation (GWh)	Specific emissions (tCO ₂ /MWh) BM	2010-11	101,146,601	117,779	0.8588	
Year	Absolute emissions (including imports) (tCO ₂)	Net generation (including imports) (GWh)																				
2008-09	430,502,442	427,700																				
2009-10	453,067,520	463,384																				
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Year	Absolute emissions (tCO ₂)	Net Generation (GWh)	Specific emissions (tCO ₂ /MWh) BM																			
2010-11	101,146,601	117,779	0.8588																			

	Validated situation	Conclusion																
	Step 6 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. The baseline grid emission factor has been calculated as; $EF_{CO2,grid,y} = 0.9528 \text{ tCO}_2\text{e/MWh}$ The baseline emissions thus can be estimated as: $BE_y = EG_{facility,y} \times EF_{CO2, grid,y}$ $= 64,400 \text{ MWh} \times 0.9528 \text{ tCO}_2\text{e/MWh}$ $= 61,360 \text{ tCO}_2\text{e/annum}$ Emission reductions The annual emission reductions from the project activity can be estimated as the difference between the baseline emissions and the project emissions as follows: $ER_y = BE_y - PE_y$ $ER_y = 61,360 - 0 = 61,360 \text{ tCO}_2\text{e/annum}$ The average annual emission reduction is 61,360 tCO₂e over 10 year fixed crediting period.																	
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	<table><tr><th>Data/Parameter title: $EF_{grid,OM,y}$</th><th>Comments</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Fixed throughout the crediting period?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes, tCO₂/MWh</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Value provided is considered reasonable?</td><td>Yes, 0.9842</td></tr><tr><td>Has this value been verified?</td><td>Yes, from the CO₂ baseline database for Indian Power sector, version 07</td></tr></table>	Data/Parameter title: $EF_{grid,OM,y}$	Comments	Title in line with methodology?	Yes	Fixed throughout the crediting period?	Yes	Data unit correctly expressed?	Yes, tCO ₂ /MWh	Appropriate description of parameter?	Yes	Source clearly referenced?	Yes	Value provided is considered reasonable?	Yes, 0.9842	Has this value been verified?	Yes, from the CO ₂ baseline database for Indian Power sector, version 07	OK
Data/Parameter title: $EF_{grid,OM,y}$	Comments																	
Title in line with methodology?	Yes																	
Fixed throughout the crediting period?	Yes																	
Data unit correctly expressed?	Yes, tCO ₂ /MWh																	
Appropriate description of parameter?	Yes																	
Source clearly referenced?	Yes																	
Value provided is considered reasonable?	Yes, 0.9842																	
Has this value been verified?	Yes, from the CO ₂ baseline database for Indian Power sector, version 07																	

	Validated situation		Conclusion	
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.	Choice of data correctly justified?	Yes		
	Measurement method correctly described?	N.A.		
	Data/Parameter title: EF_{grid,BM,y}	Comments		
	Title in line with methodology?	Yes		
	Fixed throughout the crediting period?	Yes		
	Data unit correctly expressed?	Yes		
	Appropriate description of parameter?	Yes		
	Source clearly referenced?	Yes		
	Value provided is considered reasonable?	Yes,0.8588		
	Has this value been verified?	Yes, from the CO ₂ baseline database for Indian Power sector, version 07		
	Choice of data correctly justified?	Yes		
	Measurement method correctly described?	N.A.		
	Data/Parameter title: EF_{grid,CM,y}	Comments		
	Title in line with methodology?	Yes		
	Fixed throughout the crediting period?	Yes		
	Data unit correctly expressed?	Yes, tCO ₂ /MWh		
	Appropriate description of parameter?	Yes		
	Source clearly referenced?	Yes		
	Value provided is considered reasonable?	Yes,0.9528		
	Has this value been verified?	Yes, from the CO ₂ baseline database for Indian Power sector, version 07		
	Choice of data correctly justified?	Yes		
	Measurement method correctly described?	N.A.		
	Data/Parameter title: EG_{facility,y}	Comments		
	Title in line with methodology?	Yes		
	Fixed throughout the crediting period?	No, determined ex-post		
	Data unit correctly expressed?	Yes, MWh/year		
	Appropriate description of parameter?	Yes		
	Source clearly referenced?	Yes, from the third party wind		

	Validated situation		Conclusion
		study report	
	Value provided is considered reasonable?	Yes, 64,400	
	Has this value been verified?	Yes	
	Choice of data correctly justified?	Yes	
	Measurement method correctly described?	Yes, Continuous measurement and at least monthly recording	
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.	The PP has correctly sourced the grid emission factor data from the CO ₂ baseline database for Indian power sector, Version 07. Validation team confirms that all assumptions and data used by the PP is listed in the PDD including their references and sources, and that the documentation used as the basis of these assumptions and sources of data is correctly quoted and interpreted in the PDD.		OK
4. Confirm that all estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.	The baseline emissions can be replicated using the data and parameter and could be confirmed from the emission reduction spreadsheet submitted by the PP.		OK

	Validated situation	Conclusion
SECTION 6. Additionality of a project activity		
1. Does the PDD clearly describe how the proposed CDM project activity is additional?	Yes ☒ No ☐	OK
2. List the documents and tools provided by the CDM Executive Board used to demonstrate the additionality	Following documents were referred to determine additionality. Tool for the demonstration and assessment of additionality, Version 06.1.0, Guidelines on the assessment of investment analysis, Version 05	OK

	Validated situation	Conclusion
SECTION 6a. Prior consideration of the clean development mechanism		
1. Does the PDD clearly indicate the start date of the project activity in format: dd/mm/yyyy, and is it in line with the Glossary of CDM Terms?	Yes ☒ No ☐ The PP has considered the project start date as 12/07/2011, the date of signing of the supply agreement as the start date of the project activity. The team confirmed the start date as 12/07/2011, in accordance with Glossary of CDM Terms, Version 07. from the review of following documents: 1. Supply agreement dated 12/07/2011 2. Erection and commission agreement dated 12/07/2011 3. Service and availability agreement dated 12/07/2011	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.		
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.	The start date of the project is on 12/07/2011 and as per the UNFCCC requirements; PP has to give the prior intimation to the UNFCCC in writing within 6 months from the start date of the project. The prior intimation was sent to UNFCCC on 29/04/2011 which could be confirmed from the website of UNFCCC. The validation team had confirmed the name of the project activity on the list of notifications available from the UNFCCC website. Thus, LRQA confirms that the CDM was seriously considered in the decision to implement the project. The validation team cross-verified the following documents to confirm the CDM prior consideration. • Copy of prior consideration form (F-CDM-prior consideration) sent by the PP dated 27/04/2011 to UNFCCC secretariat, • The mail sent by the PP to the UNFCCC and the host country DNA dated 29/04/2011 and • The acknowledgement mails from the host country DNA and the UNFCCC dated 10/05/2011 and 09/06/2011 respectively. Hence, as per paragraph 2 of the 'Guidelines on the demonstration and assessment of prior consideration of the CDM' the PP has considered CDM benefits in the decision to undertake the project as a CDM project activity.	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.	The start date is on 12/7/2011 which is after the date 02/082008 and hence not applicable.	OK

	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		OK	
	No	Description in the PDD		Describe why it is credible and complete
		The project activity is the installation of a new wind power plant. This project is not a modification/ retrofit of any existing electricity generation facility. Hence, in accordance to the approved methodology ACM0002, Version 13.0.0, the baseline scenario for new installation facility is described as: <i>“Electricity delivered to the grid by the project would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system.”</i>		The most realistic baseline scenario prescribed in the PDD is in accordance with the applied methodology ACM0002 Version 13.0.0 that pre-defines the baseline scenario for new grid connected renewable power plant. This project falls under the above said category. Hence, it is credible and complete.

	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.	PP has demonstrated additionality by applying the investment analysis to the proposed project activity. All the relevant parameters are sourced from Quotation, tariff order, and local taxation laws. The validation team confirmed these parameters from the review of quotation, tariff order and host country expertise on taxation laws. Input values are sourced from quotation dated 25/01/2011, tariff order dated 20/03/2009 that were available at the time of investment decision on 10/02/2011. LRQA validated the input values used in the investment analysis and confirmed its appropriateness and consistent application of the values that are valid and applicable at the time of investment decision by the project participant in accordance with the Paragraph 6 of the 'Guidelines on the assessment of investment analysis' Version 05. All the investment analysis spreadsheets are in readable formats and all relevant cells are viewable and unprotected. Suitability of input parameters was confirmed from the comparison of other registered CDM wind power projects in Gujarat, India. Earlier, the PP had chosen Net Present Value (NPV) as the financial indicator and Discounting rate of the power industries as the benchmark for the project activity. However, the board resolution dated 10/02/2011 mentioned Internal rate of return (IRR) as the financial indicator. CAR-03 was raised and the resolution is detailed in the findings section of the report. PP revised the financial indicator to IRR and the benchmark for the project activity estimated through Capital Asset Pricing Model (CAPM). Hence the finding was closed. The decision to invest approximately 2,000 million INR in wind power was taken on 10/02/2011 based on the quotation submitted by the technology service provider dated 25/01/2011 and the detailed wind study prepared by a third party AWS Truepower, LLC dated 07/01/2011. The price in the quotation was indicated per WTG and the team confirms that the cost of 15 WTGs as per this pricing is 2,010 million INR and hence can confirm that the board decision is for installation of 15 WTGs .The PP has provided a copy of the true extract of minutes of meeting of board of directors. The validation team confirmed the investment decision date from review of the original minutes book available at the Corporate office of the PP on 18/04/2012. It was confirmed from the minutes of the meeting that the investment decision for the project	~~CL-01~~ ~~CAR-03~~ Closed

	Validated situation	Conclusion
	activity was taken on 10/02/2011 and the PP had considered the benefits from CDM for the feasibility of the project. CL-01 was raised since the PP had not appropriately justified the input parameters such as the loan amount and the interest rate considered. Further, the terminal value was not considered in the investment analysis spreadsheet. The spreadsheet and the PDD were revised with appropriate justifications. The detail of the resolution is stated in the findings section of the report. A thorough assessment of all parameters and assumptions used in the financial analysis was conducted by the validation team. The parameters were cross-checked with relevant sources. The details on the validation of input parameters and assumptions are presented in the below table.	
2. Assess the correctness of computations carried out and documented by the project participants	Based on the host country expertise and from the review of the investment analysis spreadsheet, the validation team confirms that the calculations have been correctly carried out and documented. The PP had presented the unprotected spreadsheet versions of all investment analysis, having readable formulae. LRQA could confirm that the investment analysis is presented in a transparent manner, to the extent that the reader can reproduce the results. 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. The PP had taken the wind study and the quotation from technology supplier for 15 WTGs of capacity 1.8MW each (27MW) based on which the board decision was taken. Out of these 15 WTGs for which the decision was taken, the PP installed only 14 WTGs (25.2MW) since land was not available for one WTG. This could be confirmed from the review of note to the board members dated 02/06/2011 seeking permission to implement the project with only 14 WTGs. The quotation provides the project cost indicated per WTG and the PP has done investment analysis for both the decisions (original decision of 15 WTGS as well as the revised decision of installing 14 WTGs). LRQA confirms that all the input values considered for both the investment analysis were applicable at the time of corresponding investment decisions taken by the PP. The team, during the site visit, confirmed from the review of original board meeting	OK

	Validated situation	Conclusion																										
	minutes book about the original investment decision on 10/2/2011 and the decision for short closure to install only 14 WTGs on 02/06/2011. LRQA have re-assessed the project additionality for the short closed capacity and confirm that the financial unattractiveness still remains for the short closed capacity of 25.2 MW. LRQA confirms that all the input values considered for the investment analysis were applicable at the time of investment decision. It is in compliance with the guidance 6 of the Guidelines on the assessment of the investment analysis Version 5. The team confirm the suitability of the input parameters as per VVM v 1.2 paragraph 114 (a). Also, the assessment of input parameters has been confirmed in accordance to paragraph 110 & 111 of VVM Version 1.2. The equity IRR calculated for 27MW project capacity with the input parameters as provided below work out to 11.10% for the project activity without considering the benefits from the CDM revenue which is less than the benchmark of 18.44%. The equity IRR calculated for the short closed project for the capacity 25.2 MW works out to 11.50% without considering the CDM revenue which is less than the equity benchmark of 18.97% available to the PP at the time of short closure investment decision date.																											
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.	The sensitivity analysis has been conducted for parameters: • Capital cost • O&M cost • Tariff • Generation The summary is below: For the original investment decision <table><tr><th rowspan="3">Parameter</th><th colspan="3">Original Investment decision on 10/02/2011</th></tr><tr><th colspan="3">Variation</th></tr><tr><th>10%</th><th>-10%</th><th>Cross over point</th></tr><tr><td>Capital Cost</td><td>9.20%</td><td>13.43%</td><td>-25%</td></tr><tr><td>O&M cost</td><td>10.55%</td><td>12.01%</td><td>Not Applicable</td></tr><tr><td>Tariff rate</td><td>14.19%</td><td>8.45%</td><td>26.6%</td></tr><tr><td>Generation</td><td>14.19%</td><td>8.45%</td><td>26.6%</td></tr></table>	Parameter	Original Investment decision on 10/02/2011			Variation			10%	-10%	Cross over point	Capital Cost	9.20%	13.43%	-25%	O&M cost	10.55%	12.01%	Not Applicable	Tariff rate	14.19%	8.45%	26.6%	Generation	14.19%	8.45%	26.6%	OK
Parameter	Original Investment decision on 10/02/2011																											
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	10%	-10%	Cross over point																									
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Tariff rate	14.19%	8.45%	26.6%																									
Generation	14.19%	8.45%	26.6%																									

	Validated situation	Conclusion
	<u>Generation:</u> The IRR does not cross the benchmark for a reasonable 10% variation in the generation. For additionality assessment net generation, 5057MWh/WTG/annum (PLF of 32.07%), sourced from the quotation has been used. The IRR crosses the benchmark for an increase in generation of 26.60% to the estimate, which is highly unlikely and unrealistic. Net generation estimated in the third party report is 4600MWh/WTG/annum (PLF of 29.17%), which is lower than the generation considered for additionality assessment. Further, the quotations from the technology supplier feature a more lucrative generation as a marketing strategy. LRQA also reviewed the Tariff order of the Gujarat Electricity Regulatory Commission 2010 which prescribes a Capacity Utility Factor of 23%. Therefore, the generation considered for the project can be deemed appropriate and a rise in generation of 26.60% is a very unlikely situation <u>O&M:</u> The IRR does not cross the benchmark for a reasonable 10% variation in the O&M cost. Further, IRR does not cross the benchmark even when O&M cost is not considered. The PP has already signed the agreement for O&M with the technology supplier at a rate 25% lower than the value offered in the quotation and hence a deduction of 100% in the O&M cost is not possible. <u>Tariff:</u> The IRR does not cross the benchmark for a reasonable 10% variation in the tariff rate. The IRR crosses the benchmark for a 26.60% increase in tariff rate. Further, power purchase agreement has already been signed by the PP which mentions a fixed rate of INR 3.56/kWh for a period of 20 years. Therefore, an increase in tariff by 26.60% is not possible. <u>Capital cost:</u> The IRR does not cross the benchmark for a reasonable 10% variation in the capital cost. The IRR crosses the benchmark for a decrease in capital cost by 25%. PP has signed a supply agreement and erection & commissioning agreement which specify the total project cost as 9% lower than that in the quotation. Therefore, a decrease of 25% in the project cost is not possible. The sensitivity crossover argument of Generation, Tariff rate, O&M and project cost presented for 27 MW project above hold good for the short closure project of 25.2 MW as well as given below.	

	Validated situation			Conclusion
		Decision for revised project activity (short closure) dated 02/06/2011		
		Variation		
	Parameter	10%	-10%	Cross over point
	Capital Cost	9.09%	14.82%	-18.27%
	O&M cost	10.80%	12.63%	Not applicable
	Tariff rate	15.51%	8.18%	20.5%
	Generation	15.51%	8.18%	20.5%
	<u>Generation:</u> The IRR does not cross the benchmark for a reasonable 10% variation in the generation. For additionality assessment net generation, 5057MWh/WTG/annum (PLF of 32.07%), sourced from the quotation has been used. The IRR crosses the benchmark for an increase in generation of 20.50% to the estimate, which is highly unlikely and unrealistic as explained above. <u>O&M:</u> The IRR does not cross the benchmark for a reasonable 10% variation in the O&M cost. Further, IRR does not cross the benchmark even O&M cost is not considered. The PP has already signed the agreement for O&M with the technology supplier at a rate 25% lower than the value offered in the quotation and hence a deduction of 100% in the O&M cost is not possible. <u>Tariff:</u> The IRR does not cross the benchmark for a reasonable 10% variation in the tariff rate. The IRR crosses the benchmark for a 20.50% increase in tariff rate. Further, power purchase agreement has already been signed by the PP which mentions a fixed rate of INR 3.56/kWh for a period of 20 years. Therefore, an increase in tariff by 20.50% is not possible. <u>Capital cost:</u> The IRR does not cross the benchmark for a reasonable 10% variation in the capital cost. The IRR crosses the benchmark for a decrease in capital cost by 18.27%. PP has signed a supply agreement and erection & commissioning agreement which specify the total project cost as 9% lower than that in the quotation. Therefore, a decrease of 18.27% in the project cost is not possible.			

	Validated situation	Conclusion

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
Total WTG capacity	MW (At the time of investment decision) MW (Actual Project implemented Capacity)	27 MW (15Nos x1.8 MW each) 25.25 MW (14 Nos X 1.8 MW each)	Quotation	The capacity of WTG was verified from the indicative quotation from the technology service provider dated 25/01/2011 for 15 WTGs of 1.8MW capacity each. The true extract of the board meeting dated 10/02/2011 refers to an investment of approximately 2000 million INR in the wind power project. The price in the quotation was indicated per WTG and the team confirms that the cost of 15 WTGs as per this quotation is approximately 2000 INR million. Out of the 15 WTGs for which the quotation was taken, the PP installed 14 WTGs. A Clarification (CL01) was raised seeking the reason for the implementation of the project activity with 14 WTGs of 1.8MW (25.2MW) each while initially conceptualised capacity was for 15 WTGs (27 MW). The PP clarified that they have decided to implement the project with 14 WTGs due to the land limitation encountered by the technology supplier. The team has cross-checked revised board resolution by the PP to implement the project with only 14 WTGs on 02/06/2011 so as not to cause delay in project implementation. Short closure board resolution dated 02/06/2011 by the PP cross refers to the original board resolution dated 10/02/2011. The validation team confirmed the actual implementation of the project activity is the installation of 14 WTGs of capacity 1.8MW each from the review of Supply agreement, Service and availability agreement, commissioning certificate, PPA and site visit. The total installed capacity is 25.2MW.	CL-01 OK
Project cost with break up a) WTG Cost	Million INR per WTG	a) 126.415 b) 7.585	Quotation	The validation team confirmed the project cost for 15 WTGs as INR Million 2010 and project cost for 14 WTGs as INR Million 1,876 from the review of quotation dated 25/01/2011. The quote provided by the technology supplier for 15 WTGs indicated the cost per WTG as INR Million 134 (including land cost of 0.25 million INR) and for 14 WTGs, the value is calculated as 1,876 INR Million.	OK

b) Erection and Commissioning Cost Total Project cost per WTG C=a+b+ land cost (0.25 million INR) Total Project cost for 15 WTG=15XC Total project cost for the short closure with 14 WTG=14XC		Total Project cost for per WTG=134.00 Total project cost =2010.00 Total Project Cost=1876.00		The PP has implemented 14 WTGs in the place of 15 WTGs. This variation does not impact on the project additionality, as evident from the sensitivity analysis which was also carried out against the project cost -10.0%, as the IRRs do not cross the benchmark. The firm project cost was confirmed from the review of Supply agreement which is Million INR 1,604. This is 8.96% lower than the value mentioned in the offer. The percentage change is covered in the sensitivity analysis of 10%. Suitability of the project cost was also assessed through the comparison with similar CDM registered projects. The comparison of Project cost in the quotation and the purchase orders are given below. The cost for 14 WTGs are considered for this comparison (the costing is done per WTG basis) as the actual PO was issued for 14 WTGs and hence not comparable with the total cost of 15 WTGs.																	
				<table><tr><th></th><th>Quotation for 14 WTGs (million INR)</th><th>Supply Agreement for 14 WTGs (million INR)</th><th>Change (%)</th></tr><tr><td>WTG Cost</td><td>1769.81</td><td>1604.35</td><td>9.35%</td></tr><tr><td>E&C cost</td><td>106.19</td><td>103.65</td><td>2.40%</td></tr><tr><td>Total</td><td>1876.00</td><td>1708.00</td><td>8.96%</td></tr></table>			Quotation for 14 WTGs (million INR)	Supply Agreement for 14 WTGs (million INR)	Change (%)	WTG Cost	1769.81	1604.35	9.35%	E&C cost	106.19	103.65	2.40%	Total	1876.00	1708.00	8.96%
						Quotation for 14 WTGs (million INR)	Supply Agreement for 14 WTGs (million INR)	Change (%)													
				WTG Cost		1769.81	1604.35	9.35%													
				E&C cost		106.19	103.65	2.40%													
Total	1876.00	1708.00	8.96%																		
Suitability of the Project cost was also assessed through the comparison with other CDM registered projects and the team confirm that the Project cost considered is appropriate. The projects were considered to be similar to the proposed one if they have installed same type of machine (1.8MW Vestas make WTG) in the same region Gujarat state. The comparison is presented below. The Cost/WTG for each of the project includes the WTG cost and the E&C cost.																					
<table><tr><th>Project Reference</th><th>Date of quotation</th><th>Capacity (MW)</th><th>number of WTGs</th><th>Cost/WTG (Million INR)⁷</th></tr><tr><td>Project Activity</td><td>25/01/2011</td><td>25.20</td><td>14</td><td>134.00</td></tr><tr><td>6702</td><td>11/08/2010</td><td>91.80</td><td>51</td><td>137.72</td></tr></table>	Project Reference	Date of quotation	Capacity (MW)	number of WTGs	Cost/WTG (Million INR) ⁷	Project Activity	25/01/2011	25.20	14	134.00	6702	11/08/2010	91.80	51	137.72						
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⁷ This cost includes the E&C cost

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7363	08/06/2010	18.00	10	132.50																										
O & M cost	Million INR/WTG/year	2.8	Quotation	The validation team confirmed the O&M cost from the review of quotation dated 25/01/2011. Further, firm O&M cost was confirmed from the review of Service and availability agreement which is INR 2.24 Millions/WTG/year which is about 20% lower than the value mentioned in the offer. In the sensitivity analysis in the above section, it was confirmed that the project is still financially unattractive even if the O&M cost is completely waived. Suitability of the O&M cost was also assessed through the comparison with other similar CDM registered projects. The projects were considered to be similar to the proposed one if they have installed same type of machine (1.8MW Vestas make WTG) in the same region Gujarat state. The comparison is presented below. <table><tr><th>Project Reference</th><th>Date of quotation</th><th>Capacity (MW)</th><th>number of WTGs</th><th>O&M cost (Million INR/WTG/ year)</th></tr><tr><td>Project Activity</td><td>25/01/2011</td><td>25.20</td><td>14</td><td>2.8</td></tr><tr><td>6702</td><td>11/08/2010</td><td>91.80</td><td>51</td><td>2.6</td></tr><tr><td>6491</td><td>19/07/2010</td><td>3.60</td><td>02</td><td>2.5</td></tr><tr><td>7363</td><td>08/06/2010</td><td>18.00</td><td>10</td><td>2.5</td></tr></table> Based on the comparison, the team confirm that the O&M cost considered is reasonable. Even if the O&M cost waived, the project is still financially unattractive.	Project Reference	Date of quotation	Capacity (MW)	number of WTGs	O&M cost (Million INR/WTG/ year)	Project Activity	25/01/2011	25.20	14	2.8	6702	11/08/2010	91.80	51	2.6	6491	19/07/2010	3.60	02	2.5	7363	08/06/2010	18.00	10	2.5	OK
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Land Cost	Million INR /WTG	0.25	As per actual land cost in the previous project by the project proponent in the Gujarat	The PP had considered 0.25 million INR per WTG in the investment analysis as per the actual cost incurred for previous projects in Gujarat. The team confirm that the land cost PP has considered is appropriate after review of land documents for the previous project by the PP in the region. The actual land cost was confirmed from the review of Land sale agreement which is 0.50 million INR per WTG that is double the value considered for the investment analysis. The same land cost is considered in the calculation of salvage value. The project is still financially unattractive even if the actual land cost is considered.	OK																									

Free O&M	Year	1	Quotation	The validation team confirmed the free O&M cost from the review of quotation dated 25/01/2011 that states that Operation and Maintenance cost shall be free for the first year of operation. The team confirm the appropriateness of free O&M for the first year after the review of the purchase orders to the technology service provider.	OK																									
Escalation in O & M	%	7.5	Quotation	The validation team confirmed the escalation in O&M cost as 7.5% from the review of quotation dated 25/01/2011. Further, actual agreed escalation in O&M cost was confirmed as 7.5% from the review of Service and availability agreement dated 12/11/2011 with the technology service provider. Suitability of the escalation in O&M cost was also assessed through the comparison with historical inflation rate. The minimum average inflation rate for the year 2010-11 was 8.33% which was available at the time of investment decision. The comparison of escalation in O&M cost for registered projects that has implemented the same type of WTGs (1.8 MW Vestas make) in the same region, Gujarat state is presented below. <table><tr><th>Project Reference</th><th>Date of quotation</th><th>Capacity (MW)</th><th>number of WTGs</th><th>Escalation (%)</th></tr><tr><td>Project Activity</td><td>25/01/2011</td><td>25.20</td><td>14</td><td>7.50%</td></tr><tr><td>6702</td><td>11/08/2010</td><td>91.80</td><td>51</td><td>5.00%</td></tr><tr><td>6491</td><td>19/07/2010</td><td>3.60</td><td>02</td><td>5.00%</td></tr><tr><td>7363</td><td>08/06/2010</td><td>18.00</td><td>10</td><td>5.00%</td></tr></table> The higher rate of 7.5% is acceptable considering that the agreement for O&M is already signed and the minimum average monthly inflation rate in India for the financial year 2010-11⁸ was 8.33% (in November 2010). The team confirm that the project is still financially unattractive even if the escalation in O&M cost is completely waived.	Project Reference	Date of quotation	Capacity (MW)	number of WTGs	Escalation (%)	Project Activity	25/01/2011	25.20	14	7.50%	6702	11/08/2010	91.80	51	5.00%	6491	19/07/2010	3.60	02	5.00%	7363	08/06/2010	18.00	10	5.00%	OK
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⁸ http://ycharts.com/indicators/india_inflation_rate

Net annual electricity generation	Million kWh/WTG/annum	5.057	Calculated from Quotation	The validation team confirmed the net annual generation from the review of quotation dated: 25/01/2011. The quotation mentions the gross generation of 6.2088 million kWh/WTG/annum. Net generation is calculated as 5.057 million kWh/WTG/annum after considering 95% machine availability, 95% grid availability, 4% transmission loss and 6% long term wind uncertainty. The PLF study report prepared by AWS True Power dated: 07/01/211 mentions net generation of 6.90 million kWh/annum for the 15 WTGs (27MW), i.e. 4.60 million kWh/WTG/annum. Net generation assessed by the third party was lower than the quotation. PP has conservatively taken higher generation for determination of additionality and lower for ex-ante emission reduction.	OK
a) Transmission loss b) Machine availability c) Grid availability d) Wind uncertainty	%	a) 4 b) 95 c) 95 d) 6	Quotation	The validation team confirmed the Transmission loss, machine availability, grid availability and the wind uncertainty from the review of quotation dated 25/01/2011. The values were cross-checked with the wind study report by AWS Truepower LLC dated 07/01/2011 and the team confirm that the values considered are appropriate.	OK
Tariff rate	INR./kWh	3.56	Tariff order dated 20/03/2009	The validation team confirmed the tariff rate from the review of GERC tariff order ⁹ dated 20/03/2009. The validation team confirmed the suitability of the tariff rate from the review of the three PPAs	OK
Tax holiday	Years	15	Income Tax Act	The validation team confirmed the tax holiday from the review of section 80-IA of income tax rules of the host country expertise and web-search ¹⁰ .	OK
IT Depreciation rate	%	80	Local taxation laws	The validation team confirmed the tax depreciation from its host country expertise. The 80% depreciation was confirmed from the web-search (Ref: http://www.thehindubusinessline.com/industry-and-economy/article3273696.ece?ref=wl_opinion). The value has been referred to from Section 32 of Income Tax Act 1961 of the host country. The validation team confirmed that the rate of depreciation is in	OK

⁹ <http://Gujaraterc.gov.in/order-20-03-2009.htm>

¹⁰ <http://law.incometaxindia.gov.in/dittaxmann/incometaxacts/2005itact/section80ia.htm>

				accordance with the host country regulations and confirmed it from the referred Section of Income Tax Act 1961.	
Depreciation rate as per Companies Act	%	5.28	Companies Act	The validation team confirmed that the rate of depreciation as per the Companies Act 1956 has been applied for calculation of Profit Before Tax. The validation team confirmed that depreciation, being a non-cash item, has been added back to the Profit after Tax for calculating IRR, which is in accordance with guidance 5 of 'Guidelines on the Assessment of Investment Analysis'.	OK
Corporate Tax rate	%	33.22	IT Act for FY2010-11	In accordance with the local taxation laws. Tax rate is calculated as base rate with 7.5% surcharge and 3% education cess. Base rate for the corporate tax is 30%. The validation team confirmed the corporate tax rate from web-search ¹¹ and its host country expertise	OK
MAT rate	%	19.93	Indian IT Act for FY 2010-11	The MAT rate was cross-checked and found to be correct and applicable at the time of the investment decision.	OK
Service tax	%	10.30	Directorate of Service Tax, Ministry of Finance, Govt. of India	The service tax for calculating O&M cost is as per the applicable tax rate at the time of the investment decision. The validation team cross-checked the source and found it to be acceptable.	OK
Debt-Equity Ratio for the short closed investment analysis	%	48.61:51.39	Loan sanction letter dated 17/09/2010	The team reviewed the note to board members for short closure that states the loan amount as USD 20 million available at an interest rate and terms of payment in the same lines as that of an existing loan (letter dated 17/09/2010) they have for another wind power project. The equivalent money in INR is 912 million at an exchange rate¹² of 45.60 INR per USD. (The highest of the exchange rates as on 10/02/2012, the date of decision making and the decision for short closure on 02/06/2011). If the lower interest rate is used, the IRR of the project becomes lower and hence the team confirm that the assumption is conservative.	OK

¹¹ <http://taxguru.in/income-tax/tax-rate-applicable-for-a-y-2011-12-on-income-dividend-wealth-mat-stt-capital-gain-and-presumptive-income.html>

¹² Exchange rate as of 10/02/2011- <http://www.oanda.com/currency/historical-rates/>

				The loan amount is 48.61% of the total project cost and since the remaining amount is equity funded, the team confirm that the Debt:Equity ratio is 48.61:51.39	
Moratorium period for the short closed investment analysis	Quarters	11	Based on existing loan facility available with the PP dated 17/09/2010	The team confirmed the terms of payment to be on 12th quarter and the moratorium period to be 11 quarters from the review of loan sanction letter dated 17/09/2010 for a loan taken by the PP for another wind power project. The team confirm from the review of note to board members on 02/06/2011 that the loan availability with these terms were considered in the revised decision for short closed project of 25.2 MW (14 WTGs). The team reviewed the actual loan sanction letter availed by the PP and found that the payment terms were 8 half yearly payments after a moratorium of 6 quarters. The team analysed the impact on IRR due to the change in loan repayment terms and found that the IRR is only 12.94% after the changes which is less than the benchmark. The sensitivity analysis was also checked with this IRR value and the team confirm that the IRR does not cross the benchmark for a reasonable 10% variation in the electricity generation, tariff rate of electricity, Project cost and the O&M cost. Hence the team confirm that the terms of payment and the moratorium considered is appropriate.	OK
Interest Rate for the second investment decision (short closed investment analysis)	%	7.75	Based on existing loan facility available with the PP dated 17/09/2010	The team confirmed the loan interest rate by review of loan sanction letter dated 17/09/2010 for a loan taken by the PP for another wind power project. The team confirm from the review of note to board members on 02/06/2011 that the loan availability at this interest rate was considered in the revised decision for short closed project of 25.2 MW (14 WTGs). The interest rate of 7.75% is conservative when compared to the Prime Lending Rates available in India from the major banks. The team reviewed the historical prime lending rates of State Bank of India (major public sector bank), ICICI Bank (major private sector bank) and Standard Chartered (major foreign bank) and confirm that the interest rate of 7.75% considered is conservative¹³.	OK

¹³ <http://in.reuters.com/article/2012/11/05/india-plr-idINL3E8M537920121105>

	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.	For the proposed project activity, the investment decision was taken in two phases. Initially the investment decision was taken on 10/02/2011 considering a project size of 27MW. Later, this decision was revised on 02/06/2011 to have an installed capacity of 25.2MW. For both of these investment decisions the PP had calculated post-tax IRR based on equity cash-flows and compared with expected return on equity. The expected return on equity was calculated using Capital Asset Pricing Model (CAPM), which is one of the best financial practices available. Summary of the validation and suitability is presented below. This project can be developed by any entity other than the project participant; therefore, a benchmark based on parameters that are standard in the market is considered appropriate in accordance with the Guidance 13 of the Guidelines on the Assessment of Investment Analysis. The expected return on equity was calculated using CAPM, which is one of the best financial practices available. The justification of all assumptions used for the calculation of benchmark has been provided below. The cost of equity has been calculated with the help of the following formula: $R_e = R_f + \beta \times (R_M - R_f)$ Where: R_e – Return on equity R_f – Risk free rate β – Beta value R_M – Market return <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 Month-end yield to maturity of Central Government securities for various residual maturities, for a period of 20 years (equivalent to project lifetime), published by Reserve Bank of India, India's central bank, latest at the time of investment decision. The summary of risk free rate for both the investment decisions and benchmark is presented in the table below. monthly publication dated 12/01/2011) available during the original investment decision is 8.3920% for securities maturing in 20 years, similar to project lifetime. (http://www.rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=11891)	CAR-03 Closed

	Validated situation	Conclusion
	For the decision for revised project activity (short closure) on 02/06/2011, the risk free rate of return is 8.3324 % for an investment term of 20 years, as per the report published by the RBI on 11/05/2011 http://www.rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=12220. Hence, LRQA confirms that the risk free rate of return considered is appropriate and available at the time of investment decision. <u>Expected Market rate of return:</u> For estimation of expected market rate of return, the PP has selected BSE-500 index. Bombay Stock Exchange (BSE) is the oldest exchange in Asia. Further, BSE-500 is the broadest index representing 93% of the total market capitalisation covering all 20 major industries of the economy. The BSE-500 Index is scientifically calculated and the 500 companies are selected based on market capitalisation, liquidity and balanced industry representation. Thus, this is the largest quantum of data (500 companies) available among all the other indices and provides the most comprehensive view of the Indian capital market. Therefore, BSE-500 was deemed to be the most appropriate market index. The expected average 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. 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 is calculated as: $\text{CAGR} = (\text{index value at end} / \text{index value at beginning})^{(1 / \text{no. of years})} - 1$ As per “Equity Risk Premiums (ERP): Determinants, Estimation and Implications”, by Awasth Damodaran (reference: http://pages.stern.nyu.edu/~adamodar/pdfiles/papers/ERPfull.pdf), use of vintage data for 10 years and above is considered an acceptable practice in the calculation of market returns. The PP has considered the longest period for market return, i.e. from the start of the index to the decision making time for both these investment decisions. The PP has correctly used the formula of CAGR to calculate compounded average market returns. Summary of the market returns and benchmark is presented below.	

	Validated situation	Conclusion
	Accordingly the PP has calculated the market return for longest period of 12.03 years from 01/02/1999 – 09/02/2011, i.e. from the date of inception of the BSE-500 until the date of the original investment decision with beginning value assumed as 100 since data is not available. Accordingly the market returns for the original investment decision is calculated as 17.13%. Furthermore, 12.34 years is the gap between the base year and the date of decision making for the short closed project activity and hence, the market returns are calculated to be 17.40% <u>Beta (β):</u> Beta is the measure of risk of a specific sector/company. Beta for similar power sector companies can be applied as proxy risk profile for the project activity for determination of Cost of Equity. The beta in the CAPM equation helps account for the systematic risk by quantifying the sensitivity of the stock of a listed company representing a particular project type/sector with the market returns. Out of the different time period for calculation of beta, a five year period is generally considered as a 'rule of thumb' to determine the forecasted beta. This approach is generally considered in finance. Ref: http://ideas.repec.org/a/bla/jbfnac/v27y2000-09i7&8p953-982.html and research paper, "Forecasting Beta: How Well Does the 'Five-Year Rule of Thumb' Do?" This five year approach was selected for the project activity. The PP has selected all companies in power sector for estimation of beta. The list of companies included are: • CESC Limited • Gujarat Industries Power Company Limited • KSK Energy Ventures Limited • Neyveli Lignite Corporation • Tata Power Company Limited • Torrent Power Limited • Jaiprakash Power Ventures Limited • NPTC Limited The average levered beta is taken for these similar companies to estimate the risk associated with power sector. Levered beta has been used to calculate the benchmark. Further, this beta has been used for comparison with IRR of equity as both these parameters include business as well as financing	

	Validated situation	Conclusion																								
	risks. Unlevering of beta is not justified as this would provide a benchmark which is bereft of financing risk. Thus, the comparison would not be impartial. The equity or levered beta has been referred which is acceptable for calculation of CAPM based return. Also, validation team checked similar CAPM based benchmarks of registered CDM project activities (reference no. 6031, 6113, 6390 and 7446) which refer to levered beta and hence the approach is found to be reasonable. The team confirm that the Benchmark chosen is suitable as per VVM v 1.2 paragraph 114 (b). <table border="1"> <thead> <tr> <th></th><th>Original investment decision</th><th>Revised investment decision</th></tr> </thead> <tbody> <tr> <td>Date</td><td>10/02/2011</td><td>02/06/2011</td></tr> <tr> <td>Risk free rate</td><td>8.3920%</td><td>8.3324%</td></tr> <tr> <td>Evidence of risk free rate: "Month-end Yield to Maturity of SGL Transaction in Central Government Dated Securities for Various Residual Maturities"</td><td>12/01/2011 (Ref: http://www.rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=11891)</td><td>11/05/2011 (Ref: http://www.rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=12220)</td></tr> <tr> <td>Market return</td><td>17.13%</td><td>17.40%</td></tr> <tr> <td>Market return period</td><td>From 01/02/1999 to 09/02/2011</td><td>From 01/02/1999 to 01/05/2011</td></tr> <tr> <td>Beta</td><td>1.1502</td><td>1.1728</td></tr> <tr> <td>Benchmark</td><td>18.44%</td><td>18.97%</td></tr> </tbody> </table> In India, several indices (such as BSE SENSEX, BSE-100, BSE-200, and BSE-500) exist. Using different index may result in different value of benchmark. In order to confirm the suitability of the selected benchmark, validation team cross-checked it with that derived from other indices. Further to this, on use of benchmark using a similar index for which longer vintage is available, a comparison is provided as below: At the time of investment decision on 10/02/2011		Original investment decision	Revised investment decision	Date	10/02/2011	02/06/2011	Risk free rate	8.3920%	8.3324%	Evidence of risk free rate: "Month-end Yield to Maturity of SGL Transaction in Central Government Dated Securities for Various Residual Maturities"	12/01/2011 (Ref: http://www.rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=11891)	11/05/2011 (Ref: http://www.rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=12220)	Market return	17.13%	17.40%	Market return period	From 01/02/1999 to 09/02/2011	From 01/02/1999 to 01/05/2011	Beta	1.1502	1.1728	Benchmark	18.44%	18.97%	
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	Validated situation					Conclusion
	Index	BSE-500	BSE-30	BSE-100	BSE-200	
	Number of years	12.03	31.88	26.88	20.87	
	Beta Value	1.1502	1.2135	1.1811	1.1697	
	Market Return	17.13%	17.59%	15.88%	15.81%	
	Risk free return	8.3920%	8.3920%	8.3920%	8.3920%	
	Benchmark	18.44%	19.55%	17.24%	17.06%	
	At the time of decision for installing 14 WTGs on 02/06/2011					
	Index	BSE-500	BSE-30	BSE-100	BSE-200	
	No of years	12.34	32.19	27.19	21.18	
	Beta Value	1.1728	1.2371	1.2012	1.1916	
	Market Return	17.41%	17.61%	15.99%	15.96%	
	Risk free return	8.3324%	8.3324%	8.3324%	8.3324%	
	Benchmark	18.97%	19.81%	17.53%	17.42%	
	It can be further confirmed that both the IRRs (original investment and the revised investment decision) does not cross the lowest possible benchmark calculated based on BSE-200 data i.e. 17.06% even after conducting sensitivity analysis. Since the returns as per other indices are similar to that (± 150 basis points) of the selected benchmark, it can be concluded that the benchmark chosen is an appropriate representation of the market returns expected during the time of investment decision for the project activity.					
It may be noted that IRR does not cross the benchmark even if the lowest value is considered.						
The validation team has cross-checked the return on equity available as per option (a) of the Paragraph 15 of the Guidelines on the Assessment of Investment Analysis. i.e. by choosing the default values for the expected return on equity provided in Appendix to the Guidelines. The real term value provided in the referred Appendix is converted into nominal value as follows:						
$ROE_{\text{Nominal}} = (1 + ROE_{\text{Real}}) * (1 + Inf) - 1$						

	Validated situation	Conclusion
	(Refer- http://en.wikipedia.org/wiki/Fisher equation) Where $ROE_{Nominal}$ - Expected return on equity on nominal basis ROE_{Real} - Expected return on equity on real basis Inf - Average inflation rate $\%RoE_{Nominal} = [(1+11.75\%)*(1+5.3\%)-1]$ $= 17.67\%$ The inflation forecast of 5.3% for wholesale price index based inflation sourced from the survey of professional forecasters published on 02/02/2011 by the Reserve Bank of India¹⁴ available at the time of investment decision. The IRR is still lower than this benchmark return on equity. CAR-03 was raised as Beta of BF Utilities and Reliance Infrastructure was incorrectly included in the Beta calculation. PP had not justified the appropriateness of the benchmark considering that its components were calculated using different vintage years that are not consistent with investment horizon. The PP revised the Beta calculation and justified the vintage chosen to calculate the Benchmark. The Benchmark rate was reduced to 18.44% from the previous 20.31%.The team confirm that the Benchmark chosen is suitable as per VVM v 1.2 paragraph 114 (b). The copy of board resolution indicated the investment decision was made as per the internal rate of returns from the project activity even though the investment analysis used Net Present Value. The PP revised the investment analysis to have IRR as the financial indicator and the finding was closed. The resolution is detailed in the finding section of the Findings log.	
5. If the project participants rely on values from a Feasibility Study Report (FSR) approved by any national authority, the team is required to ensure that: (a) The FSR has been the basis of the decision to proceed with the investment in	Not applicable. No FSR was prepared for this project activity	OK

¹⁴ <http://rbi.org.in/scripts/PublicationsView.aspx?id=13050>

	Validated situation	Conclusion
the project, that is, that the period of time between the finalization of the FSR and the investment decision is sufficiently short for the DOE to confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed. (b) The values used in the PDD and associated annexes are fully consistent with the FSR and, where inconsistencies occur, the DOE should validate the appropriateness of the values. (c) On the basis of its specific local and sectoral expertise, confirmation is provided, by cross-checking or other appropriate manner, that the input values from the FSR are valid and applicable at the time of the investment decision. Use the table below to cross-check input values and describe here the results of the comparison.		

	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	OK			
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	Not Applicable	Not Applicable	Not Applicable	Not Applicable	-
Risks related barriers	Not Applicable	Not Applicable	Not Applicable	Not Applicable	-
Technological	Not Applicable	Not Applicable	Not Applicable	Not Applicable	-
Due to prevailing practice	Not Applicable	Not Applicable	Not Applicable	Not Applicable	-
Other	Not Applicable	Not Applicable	Not Applicable	Not Applicable	-
First of its kind	Not Applicable	Not Applicable	Not Applicable	Not Applicable	-

	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.	As per the approved methodological tool, common practice analysis includes: "Projects are considered similar if they are in the same country/region and/or rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc. Other CDM project activities (registered project activities and project activities which have been published on the UNFCCC website for global stakeholder consultation as part of the validation process) are not to be included in this analysis" The PP has applied the stepwise approach prescribed by the 'Tool for demonstration and assessment of additionality' (Version 06.1.0). In step 1 the applicable output range has been correctly identified from 15MW to 40.5MW as per the project capacity in the original investment decision of 27MW. The actual implemented project capacity is 25.2MW and the applicable output range for CPA for that capacity is 15MW to 37.8MW. Since the capacity range of the original investment decision covers the range of projects for the short closed capacity, the range of 15MW to 40.5MW is considered for CPA. In step 2 the geographical scope has been identified as host country India. This is the default option and in accordance with paragraph 5 of additionality tool, Version 06.1.0. All the plants in India delivering power in the applicable output range of 15 MW to 40.5 MW have been considered taking data from the wind power directory, CEA database. The validation team confirms from its host country expertise that the wind power directory is the comprehensive document including the details of the wind power projects, and CEA database for baseline CO₂ emissions for Indian power sector includes all thermal, hydro and nuclear power projects. Therefore, the validation team confirms that this sources as appropriate.	OK
2. Determine to what extent similar and operational projects (for example, using similar technology or practice), other than CDM project activities; have been undertaken in the defined region.	The PP has considered "<i>Measure</i>" as (b) <i>Switch of technology with or without change of energy source (including energy efficiency improvement as well as <u>use of renewable energies</u>)</i>," and is in line with the paragraph 6 of the additionality tool. PP has considered power project activities with +/-50 % capacity as per Step 1 (15 MW – 40.5 MW) commissioned in the host country for the common practice analysis.	~~CAP-04~~ Closed OK

	Validated situation	Conclusion
	The validation team confirmed that the selection is in line with the paragraph 47 (applicable output range as $\pm 50\%$ of the design output capacity of 27 MW of the project activity). As per Step 2 all the project delivering the same output have been identified. The list of all the project activities under different technologies are listed in the common practice analysis (CPA) spread sheet. The PP has identified the total number of project activity as 249. Project activities registered under CDM and under validation (79 numbers) in the capacity range are excluded. The detailed break up is as follows; Thermal – 07 Projects Hydro - 46 Projects Biomass- 99 Projects Wind - 18 Projects Geothermal, Tidal and solar projects were not found in this capacity¹⁵ Thus N_{all} is 170 The validation team confirms that all the information on the project activity in various technologies is identified using sources available in public domain. CEA database Version 06 was used for identifying similar capacity plant in thermal, hydro and nuclear based technologies. Use of version 06 of the CEA database was considered appropriate since the version was available at the time project start date. For solar and biomass power plant identification, information available from Ministry of Renewable Energy (MNRE under Govt of India) is used, Relevant web links are provided in the spreadsheet. In Step 3, out of the 170 identified power plants of comparable output capacity, the	

¹⁵ Project activities registered under CDM and under validation in the capacity range are excluded

	Validated situation	Conclusion
	PP has calculated the N_{diff} as 150 by identifying the dissimilar projects. The identified power plants that are different based on the fuel source include 7 thermal power plants, 44 hydro power plants and 99 biomass projects. Hence $N_{diff}=150$ In Step 4, the PP has calculated F factor which is 0.1176 and $N_{all} - N_{diff} = 20$. 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:</i> <i>(a) the factor F is greater than 0.2, and</i> <i>(b) $N_{all}-N_{diff}$ is greater than 3.”</i> Since one of the above criteria is not fulfilled, the validation team conclude that the project activity is not a common practice in India. CAR 04 was raised as the Common Practice Analysis was not in accordance with the tool. The Common Practice Analysis was revised in the PDD and the spreadsheet and the validation team confirms that the CPA is appropriate. Based on the available information to the validation team, it was confirmed that similar activity is not widely observed and the project activity is not considered as a common practice	
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.	Similar and operational projects, other than CDM project activities, are neither widely observed nor commonly carried out in the region.	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 Methodology 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: Electricity meter(s) Measurement procedures (if any): The following parameters shall be measured: (i) The quantity of electricity supplied by the project plant/unit to the grid; and (ii) The quantity of electricity delivered to the project plant/unit from the grid; Monitoring frequency: Continuous measurement and at least monthly recording	Data Unit: MWh/year Description: Quantity of net electricity generation supplied by the project plant/unit to the grid in year y Source of data to be used: Certificate for share of electricity generated by Wind farm Value of data: 64,400 Description of measurement methods and procedures to be applied: <u>Monitoring:</u> a) At WTG yard: Electrical Energy Meters which are electronic tri-vector meters of accuracy class 0.5s (Main Meter) and 0.2s (Check meter) b) At substation: Electrical Energy Meters which are electronic tri-vector ABT meters of accuracy class 0.2s (Main and Check meters) <u>Data type:</u> Measured & Calculated <u>Archiving:</u> Paper & Electronic <u>Monitoring Frequency:</u> Continuous measurement and at least monthly recording <u>Responsibility:</u>	The project activity is located in state of Gujarat. The monitoring system of this is described as follows: The electricity measurement is done at two places: at the connected substation and at the yard of each WTG. The net electricity supplied to the grid from a WTG is calculated through apportioning of the electricity measured at each yard meter of the WTG and the overall electricity of the wind farm monitored at the substation. The apportioning procedure is as follows According to the procedure the ratio of net electricity generated at the yard meter of a particular WTG to the sum of net electricity generated by all the WTGs at the yard meter is calculated. Net electricity supplied to the grid from a particular WTG is calculated as the product of this ratio and the value of net electricity (export-import) supplied to the grid measured at the Main metering system/Backup metering system at the substation. The sales invoices raised by the PP to the grid will be used for cross-checking.	OK

	QA/QC procedures: Cross check measurement results with records for sold electricity	a) At WTG yard: The O&M site-in-charge shall be responsible for the regular recording of data b) At substation: The representative of the state electricity board at the Vandhiya substation shall be responsible for the regular recording of data <u>Calibration Frequency:</u> The meters shall be calibrated once every year. The quantity of net electricity supplied to the grid by the project plant/unit measured at sub-station is measured by electronic tri-vector meters. Net electricity supplied to the grid would be calculated based on export & import data (Net electricity supplied to grid = Export electricity – Import electricity). The export and import energy will be measured continuously using above mentioned energy meters. Export & Import readings of energy meters shall be taken on monthly basis by authorized officer in the presence of PP or representative of Vestas Wind Technology India Private Limited (Vestas). The meter reading will be signed by the authorized officers from the state electricity board. The energy meter installed at sub-station is used to monitor the net quantum of electricity supplied to the grid by the wind farm (inclusive of project and non-project WTGs). The state utility will issue a monthly share certificate to all the individual investors specifying the share of net electricity exported to the grid by wind farm connected at the same sub-station. The net electricity supplied to the grid by the individual WTG will be ascertained based upon an apportioning method, which is mentioned in detail in section B.7.2 of the PDD (as below). <u>Monitoring Process at Gujarat</u> Metering of wind power is done as under:	The validation team confirms the apportioning based on the interview with personnel at the site. Based on the interview with site personnel during the site visit, it was confirmed that bidirectional trivector energy meters of 0.2s class accuracy for measuring and monitoring the electricity exported and imported on a continuous basis for each of the WTGs. For billing, the meter readings are recorded every month by GEDA/GETCO officials at the respective sites in presence of representatives of the PP. This was also confirmed through interview with the O&M team during the site visit. Hence the requirements to the data source, measurement procedures, monitoring frequency and QA/QC procedures are met by the respective separate parameters. The meter specification and the calibration frequency meet the host country requirements and good industrial practice. Procedures applicable for the monitoring are described for this parameter as appropriate. The ex-ante value is indicated based on the estimated generation in the wind study report.	
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		- Joint monthly meter reading is taken at the substation meter by representative of state electricity board and O&M service provider (on behalf of individual wind farm owners). The check meters are located outside the sub-station in the yard. Let the total generation recorded for particular month is 'X' units in sub-station meter. - Joint daily meter reading is taken at Local Meter-(transformer yard meter of each WTG) by representative of O&M service provider (on behalf of individual wind farm owners) which is approved by representative of state electricity board on a monthly basis. Let us assume total approved generation of Powerica recorded for particular month is 'Y₁' units. - Similarly joint meter reading for other wind farm owners is also taken. Let the generation of individual owner recorded for particular month are 'Y₂, Y₃,.....Y_n' units. - The state electricity board apportions 'X' to individual wind farm owners using following formula and issues monthly certificates. Net units calculated for billing = $X * Y_i / \sum Y_n$ - For Powerica, net units calculated for billing = $X * Y_1 / \sum Y_n$ - It must be noted here that the meter readings as mentioned above are calculated as the product of meter multiplication factor and the difference of the current and previous meter readings QA/QC procedures: The Quantity of net electricity generation from the certificate for share of electricity will be cross-checked with the invoices for the sale of power by		
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		Powerica. Meter calibration shall be conducted once every year.		
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 objective, organisational structure, roles and responsibility, the monitoring instruments, data monitoring procedures and the management system. On-site review and field interviews were conducted and it was confirmed that the monitoring is planned in a reasonable manner and considered feasible to be implemented by the PP.			OK
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 that will ensure reliable monitoring and reporting of the ERs.			OK
	Validated situation			Conclusion
SECTION 8. Local stakeholder consultation				
1. Determine whether comments by local stakeholders that can reasonably be considered relevant for the proposed CDM project activity, have been invited.	The validation team confirmed from the review of minutes of meeting and interview of local villagers that relevant stakeholders were invited for the meeting through personal invitation letters dated 08/08/2011 and newspaper advertisement in local newspaper 'Kutch Mitra' dated 30/07/2011. The meeting was held on 18/08/2011 at Vandhiya. The validation team confirmed through the interview of the local villagers that they were informed about the meeting and sufficient timeframe was provided. Therefore, the validation team confirmed that the invitation of comments was made in an open and transparent manner, in a way that facilitates comments to be received from local stakeholders and allows for a reasonable time for comments to be submitted. Further, from the interviews it was also confirmed that the agenda of the meeting includes comments on the proposed project activity.			OK
2. Confirm that the summary of the comments received as provided in the PDD is complete.	No adverse comment was raised and the was confirmed from the interviews of the local stakeholders during the site visit. The validation team confirms that the summary of comments received as provided in the PDD is complete. This was confirmed by the validation team through the review of minutes of stakeholder's meeting dated 18/08/2011			OK

3. Confirm that the project participants have taken due account of any comments received and have described this process in the PDD.	No adverse comment was received during the local stakeholder consultation process that requires further action by the PP. This was confirmed by the validation team through the review of minutes of stakeholder's meeting dated 18/08/2011. This was also confirmed during the site visit.	OK
	Validated situation	Conclusion
SECTION 9. Environmental Impacts		
1. Is an EIA required by the environmental legislation of the host country? Describe the legislation applicable.	As per the Ministry of Environment & Forest (MoEF), Government of India, Environmental Impact Assessment (EIA) studies of the wind power generation plant is not an essential requirement as it is not covered under the applicable categories as described in EIA Notification of 1994, or the Amended Notification of 2006 and 2009.	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.	Not applicable	OK
3. Confirm that environmental impacts considered significant by the PPs or the Host country are described in the PDD, including mitigation measures.	Not applicable	OK

Findings¹⁶

1. Grade / Ref:	CAR 01	2. Date:	07/05/2012	3. Status:	Closed
4. Requirement:	Paragraph 44 of CDM-VVM, Version 01.2;				
5. Nature of the Issue Raised:	LoA from the host country DNA has not been presented for validation				
6. Nature of responses provided by the project participants:	The Letter of approval dated 10/10/2012 is submitted for validation. The letter of approval is in the name "M/s Powerica Limited". The notation "M/s" which is an abbreviation for "Messrs" is included before the PP name as a salutation that is commonly used for companies.				
7. Assessment of such responses:	The submitted host country approval dated 10/10/2012 is for the project titled "Green Energy Project at Gujarat by Powerica Limited" for "M/s Powerica Limited". PP clarified that Messrs (M/s)¹⁷ is a commonly used salutation for companies and the name in the LoA is prefixed with this salutation. The name of PP was confirmed as "Powerica Limited" from the review of their company incorporation certificate dated 05/10/1989. The team also reviewed the LoAs issued in the name "M/s Powerica Limited" for another registered projects (UNFCCC ref numbers 3632, 3327 and 4572) and cross-checked with the names indicated in the corresponding PDDs that indicate the name of the PP as "Powerica Limited". The team also reviewed various other LoAs issued by host country DNA and compared it with the corresponding project details page in UNFCCC website and the approved project list in the host country DNA website and confirmed that prefixing the company name with "M/s" is very common in the letter of approval. One such approval¹⁸ along with the UNFCCC project page (6390)¹⁹ is provided here for reference. The team confirm that the name given in the LoA is different only because of the inclusion of the salutation "M/s" in front of the name and the finding is closed.				
8. References to resulting changes in the PDD or supporting annexes:					

¹⁶ Explanation of the Findings Log structure:

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

¹⁷ <http://oxforddictionaries.com/definition/english/Messrs>

¹⁸ http://www.cdmindia.gov.in/project_details_view.php?id=595&oid=1&page=5&reporttype=1

¹⁹ <http://cdm.unfccc.int/Projects/DB/LRQA%20Ltd1339417262.04/view>

No change in PDD

1. Grade / Ref:	CAR 02	2. Date:	07/05/2012	3. Status:	Closed
4. Requirement:	Paragraph 82 of VVM version 01.2				
5. Nature of the Issue Raised:	All the applicability conditions of the applied tool for the methodology are not presented and justified in the PDD				
6. Nature of responses provided by the project participants:	The applicability conditions of the methodology ACM0002, Version 13.0.0 and the applicable tools are updated and justified in section B.2 of the PDD.				
7. Assessment of such responses:	The PP has submitted the revised PDD with the section B.2 amended. Team confirm that the applicability conditions of the applied tool for the methodology are included along with the justifications. Hence the finding is closed.				
8. References to resulting changes in the PDD or supporting annexes:	Applicability conditions in PDD section B.2				

1. Grade / Ref:	CAR 03	2. Date:	07/05/2012	3. Status:	Closed
4. Requirement:	Paragraph 112 of VVM version 01.2				
5. Nature of the Issue Raised:	PP to correct the issues common to the benchmark applied 1. Weblink for risk free rate is incorrect. 2. How the beta gives the risk profile of the sector, whereas the selected similar companies have major business in sectors other than power generation, e.g. 'BF Utilities', 'Reliance infrastructure'. 3. The period of market return considered is not comparable with the project's life time. PP to justify the appropriateness of the benchmark considering that its components were calculated using different vintage years that are not consistent with investment horizon. 4. The investment analysis uses NPV method where as the certified board decision dated 10/02/2011 indicates that the PP has used Internal rate of return (IRR) for decision making				
6. Nature of responses provided by the project participants:	1. The web-link for the risk free rate of return is now corrected. 2. The PP has now excluded the above mentioned companies from the calculation of Beta. 3. For the calculation of the market returns, it is common to use a widely diversified stock market index as a proxy for the market portfolio. James C. Van Horne, for example, states, "As the market portfolio is a somewhat unwieldy thing with which to work, most people use a surrogate such as Standard & Poor's 500 stock index. Broader indexes include New York Stock Exchange (NYSE) Index of all stocks listed on that exchange and Wilshire 5000 Index, which covers 5000 stocks and includes exchanges other than NYSE as well as the over-the-counter market", James C. Van Horne, Financial Management and Policy (Sixth Edition) (p.55). See also Aswath Damodaran, Corporate Finance, Theory and Practice (Second edition) (Pp.194-200). The authors do not use Dow Jones Industrial average (DJIA), which though very old, consists of only 30 stocks. On the use of DJIA, as Damodaran states, "Using an index with a long history, such as the Dow 30, seems like an obvious solution, but returns on the Dow may not be a good reflection of overall returns on stocks".				

Please see Equity Risk Premiums (ERP) – Determinants, Estimation and Implications, Aswath Damodaran (September 2008), p.22. <http://pages.stern.nyu.edu/~adamodar/pdfiles/papers/ERPfull.pdf>

In India, number of stock market indices – BSE 30 (BSE SENSEX), BSE 100, BSE 500, S&P CNX 500, Nifty, etc. – are available. Often the choice is between a widely diversified portfolio and one that is only made up of the largest or most frequently traded companies, i.e., between ‘breadth’ and ‘depth’. While BSE-500 Index, launched in 1999, represents 94.18% of market capitalization, BSE Sensex, launched in 1979, accounts for only 46.95% market capitalization. This information can be accessed at <http://www.bseindia.com/mktlive/indiceshighlights.asp>.

Thus, drawing an analogy from the above, the project developer has chosen the BSE 500 over BSE 30 which has much more breadth but a comparatively lesser depth. To this end, it may be noted that the market return has been computed based on all the available data for BSE 500, i.e., from 01/02/1999 (launch of the index) to 09/02/2011 (one day before decision making date).

Further, PP has evaluated the benchmark using the other market indices with a longer vintage of data:

1. **BSE Sensex:** The market returns were calculated based on a period of 31.88 years, which is conservative as compared to the vintage of project lifetime. The benchmark value referring BSE Sensex is calculated as 19.55% as below.

Risk Free Rate of Return (R_f) = 8.392% (for 20 year maturity period as validated above)

Beta (Average) = 1.2135

Market Returns (R_m) = 17.59%

Hence, Benchmark (CAPM) = 19.55%

2. **BSE 100:** The market returns were calculated based on a period of 26.88 years, which is conservative as compared to the vintage of project lifetime. The benchmark value referring BSE 100 is calculated as 17.24% as below.

Risk Free Rate of Return (R_f) = 8.392% (for 20 year maturity period as validated above)

Beta (Average) = 1.1811

Market Returns (R_m) = 15.88%

Hence, Benchmark (CAPM) = 17.24%

3. **BSE 200:** The market returns were calculated based on a period of 20.87 years, which is similar to the vintage of project lifetime. The benchmark value referring BSE Sensex is calculated as 17.06% as below.

Risk Free Rate of Return (R_f) = 8.392% (for 20 year maturity period as validated above)

Beta (Average) = 1.1697

Market Returns (R_m) = 15.81%

Hence, Benchmark (CAPM) = 17.06%

It can be further confirmed that the IRR does not cross the benchmark even with the lowest possible benchmark calculated based on BSE 200 data i.e. 17.06% even after conducting sensitivity analysis. Since the returns as per other indices are almost in the same range as that of the selected benchmark, it can be concluded that the benchmark chosen is an appropriate representation of the market returns expected during the time of investment decision for the project activity.

4. The investment analysis with IRR as the financial indicator for the actual investment decision to install 15 WTGs of 1.80 MW capacity each along with the investment analysis used for the short closed capacity (25.2 MW) is presented for validation.

7. Assessment of such responses:

1. The web-link for the risk free rate of return is now corrected. Finding is closed.
2. The PP has now excluded the above mentioned companies from the calculation of Beta and The Benchmark discounting rate was reduced to 18.44% from the previous 20.31%. Finding is closed.
3. The PP has correctly calculated IRRs for both the original investment decision (15 WTGs) and for the short closed project (14 WTGs) based on post-tax equity cash-flows and compared them with the benchmarks derived from Capital Asset Pricing Model (CAPM) at the corresponding time of investment decision.

This project can be developed by any entity other than the project participant; therefore, a benchmark based on parameters that are standard in the market is considered appropriate in accordance with the Guidance 13 of the Guidelines on the Assessment of Investment Analysis. The return on equity calculated using Capital Asset Pricing Model (CAPM) is based on one of the best financial practices. LRQA confirms that the RoE calculated from the data available at Bombay Stock Exchange (BSE) website are standard. Hence, the choice of RoE to arrive at the benchmark for the project is deemed appropriate.

The team also reviewed the analysis done by the PP using different indices BSE Sensex, BSE-100 and BSE-200 and confirm that the calculations are done appropriately with the values prevailing at the time of decision. It can be confirmed that both the IRRs does not cross the lowest possible benchmark calculated based on BSE 200 data i.e. 17.06% even after conducting sensitivity analysis. Since the returns as per other indices are similar to that (± 150 basis points) of the selected benchmark, it can be concluded that the benchmark chosen is an appropriate representation of the market returns expected during the time of investment decision for the project activity.

It may also be noted that IRR does not cross the benchmark even if the lowest value from these Indices is considered. Finding is closed.

4. The PP has revised the investment analysis to include both the analysis for the capacity 27MW and 25.2 MW and has used IRR as the financial indicator as per the board resolution. Finding is closed.

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

The Section B.5 of the PDD

1. Grade / Ref:	CAR 04	2. Date:	07/05/2012	3. Status:	Closed
4. Requirement:	Paragraph 119 and 120 of the VVM, Version 01.2				
5. Nature of the Issue Raised:	Common practice analysis is not in accordance with the tool. CPA states that the geographical boundary considered is the host country. Analysis spreadsheet is only considering the projects in the state of Gujarat in the step 4 mentioning that the projects outside the state of Gujarat are excluded as they have different investment climate.				
6. Nature of responses provided by the project participants:	The Common Practice analysis is revised in the PDD appropriately considering all the projects in the capacity range of 15MW to 40.5MW and the team confirm that the CPA is done correctly. Finding closed				
7. Assessment of such responses:	The CPA is revised in the PDD as per the "Tool for the demonstration and assessment of additionality", Version 06.1.0. The latest version of the additionality tool is Version 07.0.0. The PP has applied additionality tool Version 06.1.0 which is valid for seeking registration by 22/07/2013 23:59:59 GMT.				

The validation team conclude that the project activity is not a common practice in India and that the common practice analysis is revised appropriately in accordance with the tool and 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 05	2. Date:	07/05/2012	3. Status:	Closed
4. Requirement:		Paragraph 208 of the VVM, Version 01.2			
5. Nature of the Issue Raised:					
1. Ex-ante emission factor of Operating Margin emission factor does not uses the latest database published at the time of submission of PDD for validation.					
2. Parameter $EF_{grid,OMsimple,y}$ and $EF_{grid,OM,y}$ have been interchangeably used.					
6. Nature of responses provided by the project participants:					
1. The emission factor calculation is now revised as per the latest database published at the time of the PDD submission.					
2. The $EF_{grid,OM,y}$ is calculated based on the simple OM method. Thus, the parameter $EF_{grid,OMsimple,y}$ is the $EF_{grid,OM,y}$ for the purpose of calculation of the combined margin emission factor for the grid. The same has been clarified in the PDD section B.6.1.					
7. Assessment of such responses:					
1. The emission factor and the reduction calculation are revised as per the version 07 of the CEA database. Finding is Closed					
2. The parameters for the emission factor calculation have been done appropriately and the justification is provided in section B.6.1 of the PDD. Finding is Closed					
8. References to resulting changes in the PDD or supporting annexes:					
Section B.6 of the PDD					

1. Grade / Ref:	CAR 06	2. Date:	07/05/2012	3. Status:	Closed
4. Requirement:	Paragraph 119 and 120 of the VVM, Version 01.2				
5. Nature of the Issue Raised:					
1. The PDD mentions that accuracy class as 0.2s for all the meters whereas during the site visit it was confirmed to be 0.5s for main meters at the WTG yard.					
2. Justification on data measurement for a period falling in between the billing cycles, it was mentioned that daily generation reports provided by the supplier will be used, which is for electricity generation at the generator end. PP to clarify how this data is related to electricity supplied to the grid.					
PP to clarify how the monitoring plan is feasible.					
6. Nature of responses provided by the project participants:					
1. The PDD is revised to have the correct accuracy classes for the meters.					
2. The section B.7.1 of the PDD is now revised and the period falling completely within the billing cycles will be considered for emission reduction calculation as a conservative measure.					
7. Assessment of such responses:					
1. The PDD is revised with the accuracy of the energy meters correctly indicated. Finding is closed					
2. The PDD is revised to have section B.7.1 as “In the case of the crediting period start & end dates of the project activity falls in – between the billing cycles, then emission reduction will be claimed for only those billing cycles which fall entirely within the crediting period” Finding is Closed					

8. References to resulting changes in the PDD or supporting annexes:					
Section B.7.1 of the PDD					
1. Grade / Ref:	CL-01	2. Date:	07/05/2012	3. Status:	Closed
4. Requirement:		Paragraph 111 of the VVM, Version 01.2			
5. Nature of the Issue Raised:					
PP to clarify in the investment analysis					
1. How the amount of funding sourced from bank is considered appropriate as the original board resolution states that the investment is approximately 2000 million INR of 100% equity. Further, as per the quotation and the decision is made to invest in 15 WTGs where as the investment analysis is presented with installation of 14 WTGs.					
2. How the interest rate is considered appropriate.					
3. PP to provide the evidence for loan amount and interest rate.					
4. PP to justify the appropriateness of the depreciation rates used in the investment analysis.					
5. PP to clarify why no terminal value was used for the assets remains with the PP at the end of project lifetime.					
6. Nature of responses provided by the project participants:					
1. The PP had initially decided to invest in 15 WTGs of capacity 1.80MW each; but the technology service provider informed that they are unable to get no objection certificate for the location of one of these 15 WTGs. Hence to avoid delay in implementation, the rest WTGs were decided to be installed. A note seeking this short closure was submitted to the board members on 02/06/2011. Further, one of the bankers Citibank approached the PP with an offer to lend approximately 20 million USD which was decided to be used for this investment. Both the investment analyses (15 WTGs with 100% equity and the 14 WTGs with loan) are presented to the DOE for validation.					
2. The only document available at the time of decision making pertaining to the loan was the Hypothecation deed which only contained the loan amount. The other loan terms such as the repayment period and the interest rate were fixed at a date after the decision making. Thus, for the purpose of evaluating the returns of the project, the PP has used the loan terms of the previous loan obtained for another wind project activity ²⁰ , since it was the only document for the loan terms available at the time of decision making. The relevant interest documents are now submitted to the DOE for verification.					
3. All the loan documents for the project activity are now submitted to the DOE. The loan amount is as per the Loan Hypothecation Deed dated 07/02/2011. The PP has also submitted the loan documents of the previous project activity which has been used for the repayment terms and interest rate for the investment analysis of this project.					
4. The book depreciation rate has been sourced as per the Companies Act, 1956 and the IT depreciation is as per the Income Tax Act. The sources are now mentioned in the spreadsheet					
5. Terminal value of the sum of the land cost and 10% of the equipment cost has now been considered as per the CERC notification date 15/05/2009					
7. Assessment of such responses:					
1. The validation team reviewed both the investment analyses along with the true extracts of the board resolution and the note to board members and the existing					

²⁰ <http://cdm.unfccc.int/Projects/Validation/DB/N90M094KSCKB5CDTA84L34QI2LOET3/view.html>

- loan documents to confirm that the loan amount considered is appropriate. Finding is closed
2. The interest rate considered for the revised investment analysis (with subsequent decision for short closure) was sourced from an existing loan the PP has availed from the bank for a different project. The team reviewed the loan letter and confirm that the loan interest rate of 7.75% considered in the investment analysis is conservative with the interest base rate of 8.00 to 9.00% specified by Reserve Bank of India at the time of decision making.²¹ Finding is closed.
 3. The team reviewed the hypothecation deed of wind mills in Gujarat between Citibank and Powerica Limited and the copy of existing loan facility to confirm the loan amount and the interest rate considered for investment analysis.
 4. The validation team confirm that the book depreciation rates are sources in agreement with the host country tax laws; finding is closed
 5. The team confirm that the land cost and the 10% of the cost of equipment are accounted as the terminal value in the investment analysis. Finding is closed.

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

Section B.5 of the PDD and the investment Analysis Spreadsheet

²¹ <http://rbi.org.in/scripts/WSSView.aspx?Id=15678>