

# Validation Report

Report for:  
**Modern Road Makers Pvt Ltd.**

Validation of CDM project for  
**MRMPL Wind Power Project**

LRQA Reference : CDM-MUM-0061516  
Version 02  
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## 1 Executive Summary

Lloyd's Register Quality Assurance Limited has been contracted by Modern Road Makers Pvt Ltd. representing the project participants (PP), to undertake validation of the proposed project activity MRMPL Wind Power Project.

The validation has been performed through a process of document review based on the project design document, Version 01 dated 04 May 2009 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 intends to reduce greenhouse gas (GHG) emission by utilization of wind resource to generate electricity in Rajasthan state of India through installation of 16 wind turbine generators (WTG) in the region of Jaisalmer. The electricity generated by the project activity will be supplied to Northern Eastern Western and North-Eastern (NEWNE) Grid of India. The electricity thus generated will reduce the impact of power generation from the conventional fossil fuel based power plants leading to GHG emission reduction.

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 12 CARs and 8 CLs. The PP has taken actions and submitted to LRQA revised project design document and the requisite supporting evidences. The validation team is of the opinion that the proposed project activity as described in the project design document version 06 dated 14 June 2010 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 "MRMPL Wind Power Project" to the CDM Executive Board as a CDM project activity.

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## Abbreviations

BM	Build Margin
BE	Baseline emissions
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
DNA	Designated national authority
DOE	Designated operational entity
EF	Emission factor
EIA	Environmental impacts assessment
ERPA	Emissions reduction purchase agreement
FAR	Forward action requests
GHG	Greenhouse gas
GSP	Global stakeholders' consultation process
IPCC	Intergovernmental panel on climate change
IRR	Internal rate of return
JVVNL	Jodhpur Vidyut Vitran Nigam Limited
KP	Kyoto Protocol of the United Nations Framework Convention on Climate Change
kW / kWh	Kilowatt / Kilowatt hour
LE	Leakage emissions
LoA	Letter of approval
LR	Lloyd's Register
LRQA	Lloyd's Register Quality Assurance Limited
MW / MWh	Mega watt / Mega watt hour
MRMPL	Modern Road Makers Pvt Ltd
NCV	Net calorific value
NEWNE	Northern, Eastern, Western, North Eastern grids of India
NGO	Non governmental organization
ODA	Official development aid
OM	Operating margin
PDD	Project design document
PE	Project emissions
PP	Project participant
PPA	Power Purchase Agreement
tCO <sub>2</sub> e	Tonnes of carbon dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change
WTG	Wind Turbine Generator
WAsP	The Wind Atlas Analysis and Application Program

## 2 Introduction

The project participant (PP) represented by Modern Road Makers Pvt Ltd. has contracted with Lloyd's Register Quality Assurance Limited (LRQA) to undertake validation of the proposed project activity MRMPL Wind Power Project. 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:

Prabodha C Acharya	LRQA Ltd, India	Team Leader, CDM Lead Validator, Sector Expert
Shubha Shanbhag	LRQA Ltd, India	Team Member, CDM Validator
Andrew Ritchie	LRQA Ltd.	Team Member, CDM Validator
Ketan Deshmukh	LRQA Ltd, India	Technical reviewer
Karuna Moorthy	External expert	Sector Expert to Technical reviewer
Michiaki Chiba	LRQA Ltd.	Decision Maker

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

### 2.1 Objective

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

### 2.2 Scope

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

## 2.3 GHG Project Description

The project activity is set up by Modern Road Makers Pvt Ltd (MRMPL). MRMPL is a subsidiary of IRB Infrastructure Developers Ltd.

The total output capacity of the project is 20 MW which is achieved through installation of 16 Wind turbine generators (WTGs) of Suzlon make, each of 1.25 MW capacity. The validation team confirms that the Suzlon make WTGs are based on a proven technology used elsewhere in the host country for electricity generation using wind energy.

The electricity produced from the renewable energy source is to displace electricity generation in the electricity grid system of which fossil fuel based thermal power stations are predominant, thereby reducing GHG emissions.

The estimated GHG emission reductions are 32788 tCO<sub>2</sub>e per annum.

## 3 Methodology

### 3.1 Review of documents

The validation is performed primarily based on the review of the project design document (PDD) and the other supporting documentation. The PDD Version 01 dated 04 May 2009 was initially reviewed. LRQA requested the PP to present supporting information and documents relating to the project design and such additional information and documents were also reviewed by LRQA.

Through the process of the validation, the PDD and the supporting documents of the same were evaluated to confirm the actions taken by the PP to the CARs and CLs issued by LRQA. The documents reviewed by LRQA are listed in Appendix B. LRQA reviewed the final version of the PDD version 06 dated 14 June 2010 to confirm that all changes agreed had been incorporated.

### 3.2 Follow-up interviews

Follow-up interviews with the stakeholders and a field survey were conducted as detailed in the schedule as below:

24	June 2009	Ernst & Young Pvt Ltd., Jaisalmer
24	June 2009	Modern Road Makers Pvt Ltd. , Jaisalmer
24	June 2009	Suzlon Energy Ltd., Jaisalmer
25	June 2009	Villagers of Jaisalmer district, Jaisalmer
26	June 2009	Modern Road Makers Pvt Ltd., Mumbai

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

### 3.3 Resolution of clarification and corrective action requests

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

Findings identified in the process are indicated under the titles corrective action requests (CARs) and clarification requests (CLs) and forward action requests (FARs).

CARs and CLs require the PP to take relevant actions. Criteria for judging items as CAR or CL are as follows:

**Corrective action request (CAR):**

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

**Clarification request (CL):**

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

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

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

### 3.4 Internal quality control

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

## 4 Validation protocol and conclusions

This section provides an overview of the validation activities undertaken by LRQA in order to arrive at the final validation conclusions and opinion. It includes a general discussion of details captured by the validation protocol (which is based on the Clean Development Mechanism Validation and Verification Manual version 01.1) and conclusions related to CDM requirements. Further details in relation to specific findings are provided in the Validation Findings Log.

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

- participation requirements
- general description
- baseline methodology
- emission reductions
- monitoring methodology and monitoring plan
- duration of the project activity / crediting period
- environmental impacts
- stakeholders' comments.

### 4.1 Participation requirements

A CDM project shall be approved by the Parties involved.

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 18<sup>th</sup> 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.

In accordance with EB 50 Annex 48, LRQA confirms that it has entered into a contractual agreement with Modern Road Makers Pvt Ltd.(MRMPL) for performing validation and MRMPL is the sole project proponent till the time of completion of this report.

The information of the DNAs has been confirmed by the validation team against the relevant information on the UNFCCC CDM website (<http://cdm.unfccc.int/DNA/index.html>).

A letter of approval (LoA) from the host Party's DNA dated 17/11/2009 was made available by the PP. For the validation of the host country approval obtained for the project following steps were taken by the validation team.

- Review of letter sent by PP to MOEF dated 10 January 2009 while applying for the host country approval
- Review of the letter from Ministry of Environment & Forests dated 13 April 2009 to notify PP about the meeting of national CDM Authority to be held on 22 April 2009 where the project activity (PID: 1430-09) was listed consideration
- The coloured scanned copy of the LoA was reviewed by the validation team
- The contents of the LoA and the signature of the authorised issuer were also compared with those of other approval cases issued by the host country DNAs.

The team confirmed the authenticity of the letters issued.

The validation team reviewed the LoA presented by the PP against the requirements in 'Clarification on elements of a written approval' and confirmed that the LoA contain the elements requested by the CDM-EB, including:

- Confirmation of the Party's ratification to the Kyoto Protocol;
- Voluntary participation;
- The project activity's contribution to sustainable development of the country (host Party); and
- The precise title of the CDM project activity of the final PDD referenced.

The LoA were noted as unconditional with respect of the above elements. The LoAs were also compared with those of other approval cases issued by the DNA.

Modern Road Makers Pvt Ltd. (MRMPL) is private entity having its registered office in India.

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

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

#### **CAR-1**

Letter of approval from the host country DNA was not available for validation and hence CAR-1 was raised. However the same was closed on review of LoA dated 17 November 2009

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, of CDM-EB meeting 45).

## 4.2 General description

### **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, EB 41, Annex 12) applicable to the validation.

A valid form of the CDM-PDD (Version 03.2, EB25, Annex 15) is used that was the current form at the time of validation as available on the CDM website.

### **Project description**

The objective of the project activity is to utilize wind energy for generation of electricity. The project activity involves the installation of sixteen (16) WTGs of 1.25 MW capacity each which aggregates to total capacity of 20 MW. The WTGs, are supplied by Suzlon Energy Limited (SEL).

The total expected electricity generation from the project activity is 36199 MWh annually. The electricity generated from the project activity will be exported to NEWNE grid of India on the basis of Power Purchase Agreements signed between MRMPL and Jodhpur Vidyut Vitran Nigam Limited (JVVNL). Thus, the electricity produced from the renewable energy source will displace equivalent electricity generated from the power plants in the electricity grid system which is predominantly fossil fuel based, thereby reducing GHG emissions.

The accuracy and completeness of the project description was validated by document review including offer documents, purchase orders, land sale deeds, PPA, interviews, and field survey.

### **Sustainable development**

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

### **Public funding**

The project activity uses no public fund/ use of the public fund does not result in diversion of ODA from an Annex-I Party. This has been confirmed through interviews with PP and through the certificate from Chartered Accountant A.J.Kotwal & Co dated 22 May 2009 which confirms that as per the books of accounts verified, no ODA has been used for this project.

The following issues were raised by the validation team and addressed by the PP through the validation process.

### **CAR-2**

The unique identification of the project activity was not adequately addressed in the section A.4.1.4 of PDD and CAR-2 was raised. However as a response to CAR, PP has revised the latitude and longitudes of each of the WTGs in the PDD as per the

information provided in the Commissioning certificate of the turbines. The revised co-ordinates provide the unique identification of the location of the Wind turbines. The unique location numbers for all the WTGs given in the revised PDD were compared with commissioning certificates and found to be identical. It was also confirmed that the latitude and longitude details provided in the revised PDD were provided by the technology supplier. And hence CAR-2 was closed.

#### **CAR-3**

The project activity description given in section A.2 of the PDD was not in accordance with the CDM PDD Guidelines and CAR-3 was raised. However the description provided in the revised PDD was in compliance with requirements of the PDD guidelines and CAR-3 was closed.

#### **CAR-4**

The age and average lifetime of the equipment (WTGs) based on manufacturer's specifications and industry standards was not provided in section A.4.3 and also reference to monitoring equipment and their location in the systems was not provided and CAR-4 was raised. The PDD was revised to address the requirements and the same was verified by the validation team and hence CAR-4 was closed.

#### **CL-1**

A number of editorial issues were identified in the text of the PDD which required rectification and CL-1 was raised. Those found corrected in the revised PDD and hence CL-1 was closed.

#### **CL-2**

No evidence was provided by the PP to support the statement that "No public funding is available to the project activity from parties included in Annex I", and CL-2 was raised. However the PP later provided Certificate from chartered accountant (A. J. Kotwal & Co.) dated 22<sup>nd</sup> May 2009 which confirms that MRMPL has not received any ODA for their wind power project. Hence CL-2 was closed.

## **4.3 Baseline methodology**

### **Application of baseline and monitoring methodology**

The project activity applied the approved baseline and monitoring methodology: ACM0002, Version 10 "Consolidated methodology for grid-connected electricity generation from renewable sources". Though the current version of the methodology ACM0002 is Version 11 is effective since 26 February 2010, request for registration of the projects applying the ACM0002 version 10 can be submitted until 25 October 2010, 23:59GMT, which is in accordance with EB35 Annex 13, which states: "Any revision of an approved methodology or tool referred to in a methodology shall not affect i) registered CDM project activities during their crediting period; and (ii) project activities that have been published for public comments for validation using the previously approved methodology or tool, so long as the project activity is submitted for registration within 8 months of the date when the revision became effective."

The methodology is applicable to the grid connected renewable energy plants including wind power plants. The validation team has reviewed the design and technical specification of the project activity, connection to the electricity system and definition of the project boundary as published by the appropriate authority of the host country. The

project applicability was confirmed against each condition in the approved methodology ACM0002, Version 10. The summary of the applicability criteria is listed below:

- ⇒ The project is the installation of new wind power project. LRQA has confirmed through the review of purchase orders placed by MRMPL to the technology providers.
- ⇒ The electricity generated by the project activity will be exported to the connected regional electricity grid NEWNE. LRQA has confirmed through the review of Power Purchase Agreements between MRMPL and JVVNL and CEA baseline database, version 04 published by the relevant authority of the host country.
- ⇒ The wind power project does not involve switching of fossil fuel to renewable energy sources. LRQA has confirmed that the project is a new installation and hence does not involve switching of fossil fuel to renewable energy source.

The validation team has assessed the applicability requirements and cross-verified with the supporting information and interviewed the PP and found the applicability conditions of the methodology ACM0002, Version 10 are satisfied by the project activity.

#### **Project boundary**

According to ACM0002 ver 10, 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 PDD has correctly delineated the project boundary to include the Wind turbine generators, power generation and supply of electricity to the local grid. It was confirmed that the local grid is part of the NEWNE grid through cross check with CEA database version 04 which was the latest version available at the time of validation. LRQA has confirmed the project boundary through the commissioning certificates, land documents, power purchase agreements and conducting site visit. The validation team confirmed that the identified project boundary, selected sources and gases were justified for the project activity and meets the requirements of the approved methodology.

#### **CAR-5**

Section B.3 of the PDD did not include a flow diagram of the project boundary, physically delineating the project activity and including all the equipment, systems and also the monitoring variables were not included in accordance with the CDM-PDD guidelines. Therefore, CAR-5 was raised. The PDD was revised later to modify the project boundary diagram and to include all equipments, systems and the monitoring variables and hence CAR-5 was closed.

#### **CL-3**

PP was requested to clarify why CO<sub>2</sub> emissions due to any electricity consumption in the project activity which is imported from the grid would not be included in the project boundary. The PP later clarified that electricity import will be deducted from the total generation and the net generation estimate will be arrived however for the ex-ante analysis, import has been considered zero and it will be monitored under Section B.7.1 of the revised PDD. Hence CL-3 was closed.

### **Baseline scenario**

The PP has presented the grid as the baseline scenario in accordance with the methodology ACM0002, Version 10.

LRQA could confirm through the purchase orders placed by the PP and through site visit that the wind power project is a new grid-connected renewable power plant and hence the baseline scenario is *“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”.*

The team confirmed that the baseline scenario was identified in accordance with the requirements of the approved methodology.

### **Additionality**

The project additionality was demonstrated by the PP using Tool for the demonstration and assessment of additionality Version 05.2. PP has demonstrated the financial unattractiveness of the project activity through investment analysis for which PP has applied benchmark analysis.

### **Investment analysis**

The investment analysis was done for the project using benchmark analysis. The benchmark approach is suited to circumstances where the baseline does not require investment or is outside the direct control of the project developer, i.e. cases where the choice of the developer is to invest or not to invest. This is applicable to the project case and hence benchmark analysis (Option III) is considered appropriate. This is in accordance with the para 16 of the “Guidelines on the Assessment of Investment Analysis” that states *“If the alternative to the project activity is the supply of electricity from a grid this is not to be considered an investment and a benchmark approach is considered appropriate.”*

Internal rate of return (IRR) has been calculated by estimating the project cash flows, which has been compared with the prime lending rate applicable at the time of investment decision.

### **Appropriateness of Benchmark:**

The PP has considered local commercial lending rate as a benchmark for the project activity. Local commercial lending rate has been compared with Project IRR which is in accordance with para 13 of Guidelines on the Assessment of Investment Analysis.

Reserve Bank of India monitors the lending rate of several major banks. The lending rate is published on weekly basis. The prime lending rate of major banks during the time of decision was between 12.25%-12.75%. The PP has conservatively chosen 12.25% as the benchmark for evaluation of the project's financial feasibility. Further to check the conservativeness of the benchmark the validation team has cross-checked the key lending rates for the year 2007 (which is the year previous to the year of investment decision) and it was found that the rates were in the range of 12.75 to 13.25%<sup>1</sup> and for the year 2008 (the year of investment decision) and it was found that

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<sup>1</sup> The key lending rates for the year 2007 published by RBI on 01 October 2007 (Refer <http://rbidocs.rbi.org.in/rdocs/Publications/PDFs/80255.pdf> )

the rates were in the range of 12.25 to 12.75%<sup>2</sup>. Also the weekly statistical supplements published by RBI for the month of June 2008<sup>3</sup> (which was available at the time of decision making) was reviewed by the validation team and it was found that the prime lending rates were in the range of 12.25-12.75%.

The validation team confirmed that the PP has used the lowest value of the PLR that was available during the time of investment decision. The PLR of 12.25% has been chosen conservatively as the benchmark and the same was found to be acceptable. LRQA has confirmed that the benchmark used for the project is deemed appropriate to the type of financial indicator used for comparison.

#### Internal Rate of Return

LRQA validated the timings of investment decision taken by the project proponent and the consistency and appropriateness of the input values with the timing of investment decision. LRQA confirmed the Project cost and O&M cost considered are as indicated in the offer letters from technology suppliers which were applicable at the time of investment decision. LRQA has also verified that the tax and depreciation rates used by the project proponents are considered to be those applicable at the time of investment decision. The listed input values from the offer given by technology supplier (quotation), as presented in section B.5 of PDD, have been consistently applied in the financial calculations.

The project IRR was computed for a period of 20 years, which reflects the period of expected operation of the underlying project activity (technical lifetime) and hence was found to be appropriate. LRQA confirmed the appropriateness of the technical lifetime of the project activity through reference to the C-WET website<sup>4</sup> which shows that the WTG S66 Suzlon make of 1.25 MW output capacity is under certification at C-WET. The certification is provided wherein the technical lifetime meets 20 years. In addition, LRQA compared the technical lifetime with similar project installations of same developer and other major developers and found to be acceptable. Therefore, the validation team considers the lifetime of the project activity of 20 years as reasonable.

#### Validation of input values

<b>Input Parameters considered in investment analysis</b>	<b>Value</b>	<b>Means of the validation</b>
Capacity of the wind project	20 MW	Cross verified from actual purchase orders
Gross Annual Generation/WTG	2.6 x 10 <sup>6</sup> KWh/WTG  = 41.6 x 10 <sup>6</sup> KWh	Cross verified from the quotation provided by the technology supplier

<sup>2</sup> The key lending rates for the year 2008 published by RBI on 08 October 2008 (Refer <http://rbidocs.rbi.org.in/rdocs/Publications/PDFs/87456.pdf>)

<sup>3</sup> As available on 06 June 2008- PLR range-12.25-12.75% (Refer <http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/84824.pdf>)  
 1. As available on 13 June 2008-PLR range- 12.25-12.75% (Refer <http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/84994.pdf>)  
 2. As available on 20 June 2008-PLR range- 12.25-12.75% (Refer <http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/85104.pdf>)  
 3. As available on 27 June 2008- PLR range-12.25-12.75% (Refer <http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/85254.pdf>)  
 4.

<sup>4</sup> <http://www.cwet.tn.nic.in/Docu/Revised%20List%20of%20Models%20and%20Manufacturers%20of%20wind%20turbines.pdf>

Input Parameters considered in investment analysis	Value	Means of the validation
Grid non-availability related losses	4%	Cross verified from the quotation provided by the technology supplier
Transmission losses	3%	<p>During the site visit, the validation team has interacted with the representatives of the operation and maintenance service provider (Suzlon) and it was confirmed that the transmission losses are in the range of 2-3% and losses due to grid non-availability are in range of 3-4% for project activity case.</p> <p>The validation team reviewed similar registered projects and found that the total losses vary from 0.5% to 10%. The validation team therefore found losses of 7% for the project activity to be reasonable.</p>
Net Annual Generation incl. losses	$2.418 \times 10^6 \text{ KWh /WTG}$  $= 38.688 \times 10^6 \text{ KWh}$	<p>Calculated as below</p> <p>Net Annual Generation = (Gross Annual Generation – Transmission losses)</p> <p>In accordance with Guideline for the reporting and validation of plant load factors, Version 01 (EB48, Annex 11) LRQA has confirmed that the estimate of annual electricity generation is based on the figure provided by a third party contracted by the project participant for assessment of the plant load factor for the project site. For this, LRQA reviewed the report provided by third party i.e. Fair Aero Consultant &amp; Technologist dated 18 February 2010. The estimated figures in the third party assessment report were <math>2.26245 \times 10^6 \text{ KWh/ WTG}</math> (equal to <math>36.199 \times 10^6 \text{ KWh}</math> for project) which were lower than the quotation figure provided by the technology supplier. For conservativeness, the PP has retained the estimated generation figures from quotation for the financial analysis and the ones given by third party report have been used for emission reduction calculation. The validation team found this is justified and conservative.</p>

<b>Input Parameters considered in investment analysis</b>	<b>Value</b>	<b>Means of the validation</b>
Annual O&M Costs	1.260 Million INR /WTG	The O&M costs have been cross verified from the offer letter given by technology supplier and were found to be appropriate.
% Escalation in O&M charges p.a.	5.0%	<p>The O&amp;M escalation considered has been cross verified from the offer letter given by technology supplier and was found to be appropriate.</p> <p>The appropriateness of annual escalation considered in the O&amp;M charges was confirmed through the review of the Tariff order dated 09/03/2007 which was available during the time of investment decision. The tariff order specifies a 5% escalation factor for O&amp; M charges.</p>
Power Tariff (in 1 <sup>st</sup> year)  Escalation in power tariff from 2 <sup>nd</sup> – 12 <sup>th</sup> year  Escalation in power tariff from 13 <sup>th</sup> year	INR 3.59/kWh  INR 0.02/kWh  INR 0.01/kWh	<p>The appropriateness of tariff was confirmed through the review of the Tariff order dated 09/03/2007 which was available during the time of investment decision. The tariff selected is identical to that mentioned in the tariff order and hence found to be reasonable to accept.</p> <p>Further the tariff was also compared with the actual Power purchase agreement signed by MRMPL, Suzlon Energy Limited and Jodhpur Vidyut Vitran Nigam Limited dated 15th September 2008 and through the review of invoices raised by MRMPL to JVVNL.</p>
Tax holiday	10 years	The PP also has factored in the provision of claiming tax holiday for consecutive 10 years within the first 15 years of the operation as per the income tax rule <sup>5</sup> of the host country.
Total Project Cost	INR 1040 Million	<p>The project cost is sourced from the quotation provided by the technology supplier.</p> <p>The validation team has also cross</p>

<sup>5</sup> <http://www.incometaxindia.gov.in/Acts/INCOME%20TAX%20ACT/80-ia.asp>

Input Parameters considered in investment analysis	Value	Means of the validation
		<p>verified the same from the actual purchase and work orders placed by PP<sup>6</sup> and found the values to be identical.</p> <p>To confirm the appropriateness of the project cost the same was compared with similar projects and was found to be reasonable.</p>
Funding for the project	Equity 100 %	Cross verified with undertaking given by PP dated 17 March 2010 which confirms that project is funded through 100% equity.

Various vendors like Suzlon, Enercon had made the presentations to the PP about the possibility of the wind power investment.<sup>7</sup> PP had internally decided to finalize Suzlon as the technology supplier. PP received a non-binding offer from the Suzlon subsequent to the discussion and presentations based on which the PP took the investment decision. This offer document by the technology supplier was considered reliable since Suzlon is a leading WTG manufacturer and supplier in the host country and provided all information required by the project proponent like the scope of supply, equipment price, O & M cost, delivery time, general conditions, technical specifications, estimated generation, revenue simulation and availability guarantees. This information could be compared with the contract and with the similar project cases in the host country and in the region. It was confirmed during the validation that the project participant had considered the input values from the offer document submitted by Suzlon during their investment decision on 15 July 2008. The investment decision for the project activity followed the real action for implementation of the project activity which is 19/08/2008. The validation team confirmed that there was no significant change that affects implementation of the project activity during the short time period.

It was confirmed through comparison of similar projects that the quote before negotiation was already in a reasonable level in comparison with the similar project cases and hence it was reasonable for the project owner to decide the investment based on the offer.

- 
- 1) Purchase order for the supply of 16 nos tubular tower by Modern Road Makers Pvt Ltd to Suzlon Towers and Structures Ltd.
  - 2) Work order for civil work including foundation & allied works for 16 WTGs by MRMPL to Suzlon Infrastructure Services Limited
  - 3) Work order for erection, installation and commissioning of 16 WTGs by MRMPL to Suzlon Infrastructure Services Limited
  - 4) Work order for arranging lease/sub lease rights of land and suitable access of surroundings for 16 WTGs by MRMPL to Suzlon Infrastructure Limited
  - 5) Purchase order for supply of 16 nos of Suzlon S-66, 1250 Kw rating WTGs without tower
  - 6) Work order for arrangement of adequate common power evacuation for our 16 WTGs by MRMPL to Suzlon Power Infrastructure Pvt Ltd.
  - 7) Work order for electrical works including supply & installation of electrical items, part of renewable energy devices , power transmission and metering devices for 16 WTGs by MRMPL to Suzlon Infrastructure Services Ltd.
  - 8) Purchase order for supply of Transformer, component of renewable energy device/windmill for 16 WTGs by MRMPL to Suzlon Infrastructure Services Ltd

<sup>7</sup> The board minutes dated 15 July 2008 also refer to such presentations made by Suzlon and Enercon

The values from offer letter and the purchase orders are exactly the same and hence it is most appropriate to consider these values. Further, it was noted that insurance cost although mentioned in the offer letter was not considered in the financial analysis and the same is conservative and hence accepted.

With the above assumptions, the project IRR works out to be 8.15% which is below the selected benchmark of 12.25%. Hence it can be concluded that the project is financially unattractive without the contribution of CDM revenues.

The assessment of the IRR spreadsheets involved checking the input data and accounting principles. The accounting principles adopted with respect to computation of depreciation and tax liability were found to be in order. PP had presented the unprotected spreadsheet version of investment analysis, having readable formulas. LRQA could confirm that the investment analysis was presented in a transparent manner, to the extent that the reader could reproduce the results.

#### **Sensitivity analysis:**

Sensitivity analysis has been performed in accordance with sub step 2d of the additionality tool to confirm the robustness of the result to a reasonable variation in critical assumptions. The critical parameters subjected to variation were

- 1) Generation
- 2) O&M cost
- 3) Tariff
- 4) Capital Cost

The choice of variables and range of variations met the Guidance on the Assessment of Investment Analysis. The validation team assessed the reliability and robustness of the analysis and found that the IRR of the project remains commercially unattractive with reasonable variation in critical assumptions. The variations of critical parameters and corresponding IRR have been summarised below.

Parameter Varied for IRR w/o CDM	Variation		Cross Over point
	+10%	-10%	
Generation	9.80%	6.41%	26%
O&M	7.85%	8.45%	-156%
Tariff	9.75%	6.47%	27%
Capital Cost	6.86%	9.67%	-23%

The generation figures used in investment analysis has been sourced from quotation document. The achieved annual generation by PP is well below the estimated generation. The PLF considered is 22.08%, however the actual PLF achieved in the region is 18.71%. Hence, a 26% increase in estimated generation is very unlikely.

The project is operational and the actual project cost has been verified from the purchase orders and hence a -23% variations is unlikely.

From the review of actual O&M agreements, it was confirmed that a variation of -156% is highly unlikely.

Tariff rate in India has been under government control. Though government varies tariff

rates in accordance with the market conditions or other incentives as per national priorities, so increase of tariff by 27% is unlikely.

The validation team assessed the reliability and robustness of the analysis and found that the IRR of the project remains commercially unattractive with reasonable variation in critical assumptions.

LRQA has reviewed the proposals, purchase orders and power purchase agreement and background information of the host country and confirmed that the result of the sensitivity analysis consistently supports that the project activity is not financially attractive.

### **Barrier analysis**

Barrier analysis has not been used for demonstration of additionality.

### **Common practice analysis**

Step 4 of the latest “Tool for the demonstration and assessment of additionality” prescribes that activities similar to the project activity may be considered for the common practice analysis. The project activities will be categorized as similar based on below mentioned criteria:

- Power plant set up in Rajasthan- The region chosen for assessment of common practice analysis is the Rajasthan state. In India tariff rates and the period of power purchase agreement is under the state discretion. The difference in tariff rates changes the financial returns and hence, validation team is of the opinion that state will be appropriate region for assessment of common practice.
- Of similar scale- Since the project activity is of capacity 20 MW, comparison with the power plants of size greater than 15 MW set up by a single entity has been chosen for common practice analysis. The scale of operations and investment being one of the criteria presented in the tool, hence, validation team is of the opinion that for similar scale of operations, 15MW size is appropriate.
- Project activity set up after year 2003- PP has further presented the change in regulatory framework after enforcement of the Electricity Act 2003. The Electricity Act 2003 prescribes uniform criteria for power purchase agreements and hence, validation team is of the opinion that the change in regulatory framework presented by the PP is appropriate.

Using the above criteria, validation team has reviewed the Wind Power Directory 2009 to find the similar projects. The wind power directory, 2009, which is the most recent version available at the time of validation, listing total wind projects installed in India was used to verify the data. The list of all the wind turbine owners in the state of Rajasthan, with their installed capacity, is available in the Wind Power Directory. Of the total 3486 different PPs presented in the directory, the validation team confirms that only 9 projects are found to be similar to that of the project activity as detailed in the PDD version 06, out of which 8 are CDM project activities and hence not included in the common practice analysis. The list of similar projects with reference on the CDM website is presented as below:

1. DLF Home Developers Ltd.
2. Enercon Wind Farms (Raj) Pvt. Ltd.
3. Enercon Windfarms Hindustan P. Ltd.
4. Hindustan Petroleum Corporation Ltd.
5. K S Oils Ltd. (as two separate small scale projects)
6. Rajasthan Ren. Energy Corp. Ltd.
7. Rajasthan State Mines & Mineral Ltd. (as three separate large scale projects)

Apart from the above mentioned list, the project activity of Power Finance Corporation (PFC) with index number 2044 in the wind power directory has been setup by Enercon Wind Farms (Jaisalmer) and PFC has financed the project. This project activity is also registered at UNFCCC that has been confirmed by the validation team.

No further data/information for the remaining project listed at the index number 1051 (IDFC) of the Wind power directory, was accessible and therefore, excluded from this analysis, in accordance with the additionality tool.

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.

### **Prior serious consideration of CDM**

The starting date of a CDM project activity is the earliest date at which either the implementation or construction or real action of a project activity begins (Glossary of CDM terms Version 05). In light of the above definition, the start date shall be considered to be the date on which the PP has committed to expenditures related to the implementation or related to the construction of the project activity.

In validating the start date, purchase orders, the land sale deeds and installation contracts were reviewed. The wind turbines were purchased from Suzlon by releasing purchase orders on 19/08/2008. Also the Work order for arranging lease/sub lease rights of land and suitable access of surroundings for 16 WTGs by MRMPL to Suzlon Infrastructure Limited was placed on 19/08/2008. As such, 19 August 2008 was considered as the earliest of the start date with respect to this project activity.

The starting date of the project activity (19/08/2008) is a date earlier than the date of publication of PDD for global stakeholder consultation (8/05/2009).

As the start date is after 02 August 2008, the project participant must inform a Host Party DNA and the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status.<sup>8</sup> Such notification must be made within six months of the project activity start date and shall contain the precise geographical location and a brief description of the proposed project activity, using the standardized form F-CDM Prior Consideration.

A notification was sent to UNFCCC on 24 November 2008. The UNFCCC secretariat maintains a publicly available list of such notifications and it was confirmed from the UNFCCC website that the notification was sent by the PP on 24 November 2008. It was noted that the notification had not been sent in the standard format since the format was not available as on 24 November 2008. The Prior Consideration of the CDM Form was first available on 17 July 2009 (EB48 Annex 62).

The host party DNA was also notified through the application of host country approval on 10 January 2009. Both notifications were made within six months of the start date. It was also confirmed that brief description of the project including the precise geographic location was provided to UNFCCC and the host country DNA.

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<sup>8</sup> Guidelines On The Demonstration and Assessment of Prior Consideration of the CDM

The board decision dated 15 July 2008 specifically stated that the CDM benefits will help in improving the financial viability of the project, which is supported with the above discussed investment analysis.

The chronology of events now presented in the revised PDD version 06 has been validated through cross-checks with supporting documentation referenced. LRQA has confirmed that there was less than 2 years of a gap between the documented evidence provided, as per para 6 (b) of 'Guidance on the demonstration and assessment of prior consideration of the CDM' version 03.

Through the process of validation, LRQA has confirmed that the management was aware of CDM in their investment decision and had taken continued and real actions to secure the CDM status of the project in parallel with its implementation in accordance to the ver 03 of 'Guidance on the demonstration and assessment of prior consideration of the CDM'.

#### **CAR-6**

Since the starting date of the project activity was before the date of validation, the PP was required to provide an implementation timeline of the proposed CDM project activity in the PDD. However the same was not found and CAR-6 was raised. The PP has now revised the PDD to include all the timelines and the description of evidence to support these actions. The evidence provided by PP has been verified by the validation team and found to be appropriate. Hence CAR-6 was closed.

#### **CAR-7**

The investment analysis was not presented in a transparent manner in the PDD and also all the relevant assumptions were not presented. Therefore, CAR-7 was raised. The PP has now revised the PDD to include all relevant assumptions for the calculation of investment analysis and their sources. The validation team has cross verified all the values and the financial spreadsheet for appropriateness and conservativeness and hence CAR-7 was closed.

#### **CL-4**

The financial analysis spreadsheet provided by the client did not provide supporting evidence for all the assumptions presented, the procedure for tax calculations was not clear and other clarifications were required with respect to salvage value, IT depreciation, subsidies if taken by the PP. Therefore, CL-4 was raised. As a response, the PP revised the IRR spreadsheet to include all sources of information about the assumptions and input values. Also, it was clarified by the PP that no subsidies or financial incentives were obtained for the project. The validation team has cross verified the revised computation and the information presented and found to be appropriate, and hence CL-4 was closed.

#### **CL-5**

The sensitivity analysis spreadsheet had not been provided for validation by the PP and other clarifications with respect to selection of parameter for sensitivity were required. Therefore, CL-5 was raised. The PP provided the sensitivity analysis spreadsheet. The validation team has cross verified the selected parameters subjected to sensitivity along with computations and found these to be appropriate. Hence CL-5 was closed.

**CAR-8**

Sub step 4a of common practice analysis presented in section B.5 of the PDD refers to other CDM projects which are in various stages of CDM development. This was not in line with additionality tool approach and therefore CAR-8 was raised. CAR-8 was closed upon review of revised common practice analysis and supporting information provided by the PP.

**CL-6**

The data presented for common practice analysis by the PP was not correct and also the source of data for the wind power potential figures for Rajasthan and India were not mentioned. Therefore, CL-6 was raised. In response to this, the PP presented a revised common practice analysis data which was in line with the step 4a and 4b of the additionality tool. The data has also been verified by the validation team and hence CL-6 is closed.

## 4.4 Emission reductions

**Project emissions**

Project emissions may arise due to auxiliary consumption of electricity from the grid during start-up and has been accounted for as ECy. For ex-ante calculation of emission reductions ECy is assumed as zero and the same would be monitored under section B.7.1 of the PDD. The net amount of power exported to the grid is accounted as EGy. Hence, no project emission ( $PE_y$ ) have been considered for the project activity.

**Leakage**

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, fuel handling (extraction, processing, and transport), and land inundation (for hydroelectric projects – see applicability conditions above). Project participants do not need to consider these emission sources as leakage in applying this methodology.

**Baseline emissions**

According to the methodology ACM0002 version 10 the baseline emissions are the product of electrical energy expressed in kWh of electricity produced by the renewable generating unit multiplied by an emission factor

The baseline EF is to be calculated as a CM consisting of OM and BM factors based on data from an official source made publicly available.

The combined margin (CM) emission factor (EF) for the displaced electricity was calculated based on the 'Tool to calculate the emission factor for an electricity system' version 02 (hereinafter referred to as "*the tool*"), in accordance with the applied methodology. This is the currently active version of *the tool* applicable from 30<sup>th</sup> October 2009.

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 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 4.0 has been applied since it was current at the time of commencement of the validation on 04 May 2009. CEA Database version 4.0 was publicly available from October 2008 and therefore LRQA deemed use of CEA database version 4.0 as appropriate for the project activity.

[http://www.cea.nic.in/planning/c%20and%20e/database\\_publishing\\_ver4.zip](http://www.cea.nic.in/planning/c%20and%20e/database_publishing_ver4.zip)

**Step 1 of the tool** requires identification of the relevant electric power system. In line with the requirements specified in *the tool*, the PP has used a regional grid definition applicable for large countries like India with layered dispatch systems. Historically, the Indian power system was divided into five independent regional grids, namely Northern, Eastern, Western, Southern, and North-Eastern. Each grid covered several states. Since August 2006 however, all regional grids except the Southern Grid have been integrated and are operating in synchronous mode, i.e. at the same frequency. The project activity is located in NEWNE Grid and hence its selection for the purpose of estimation of baseline emission factor is considered appropriate. Therefore, LRQA confirms the applicability of Step 1 of *the tool*.

**Step 2 of the tool** gives PP an option to include off-grid power plants in the project electricity system. PP has chosen only grid power plants for analysis.

**Step 3 of the tool** requires selecting an operating margin method. Of the four methods provided in *the tool* for calculating the operating margin ( $EF_{grid,OM,y}$ ), the PP has selected a simple OM method. *The tool* specifies that the simple OM method can only be used if the low-cost/must-run resources constitute less than 50% of total grid generation on average of the five most recent years, or 2) based on long-term averages for hydroelectricity production.

The Simple OM method selected by the PP is justified and appropriate as the average proportion of low-cost/must run resources as average of 5 years (2003-04: 17.37, 2004-05: 16.84%, 2005-06: 18.0%, 2006-07: 18.5%, and 2007-08: 19.0%) is less than 50%. Low operating cost/must run resources include hydro, wind, low-cost biomass 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 tool** requires the calculation of the operating margin emission factor according to the selected method. 'Selected method' in this context is the 'simple OM' chosen in Step 2. 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 Operating Margin (OM) emission factor is calculated as a 3-year generation-weighted average following the guidance of the Tool using the publicly available data from official sources for year 2005-06, 2006-07 and 2007-08 that are the most recent 3 years for which data was available at the time of validation. The validation team

reviewed the calculation and the supporting documents and validated the OM emission factor to be 1.0086 tCO<sub>2</sub>e/MWh.

**Step 5 of the tool** requires the identification of the cohort of the power units to be included in the build margin. The CEA database has selected the set of power capacity additions in the electricity system that comprises 20% of the system generation (in MWh) and these have been built most recently. The calculations are based on generation, fuel consumption and fuel quality data obtained from the power stations.

In validating this step, LRQA confirmed that

- (i) the identified power capacity additions comprise 20% of the system generation for the year under consideration.
- (ii) none of the considered power capacity additions considered under (i) above have been built more than ten years earlier.

**Step 6 of the tool** requires calculation of the build margin emission factor.

The Build Margin (BM) emission factor has been estimated ex-ante by considering the most recently built power plants that generate 20% of the electricity in the grid system that is available at the time of validation.

The CEA database provides a BM value for the NEWNE grid as 0.5977 tCO<sub>2</sub>e/MWh. As part of validation, LRQA confirmed through independent calculations the BM for the year 2007-08 as per the following summary:

Year	Absolute emissions tCO <sub>2</sub>	Net Generation GWh	Specific emissions (tCO <sub>2</sub> /MWh)  BM
2007-08	601,93,616	100,706	0.5977

**Step 7 of the tool** requires calculation of the combined margin emission factor as per the following equation:

The baseline emission factor is calculated as the weighted average of the OM emission factor and BM emission factor as;

$$EF_{\text{grid,CM,y}} = EF_{\text{grid,OMsimple,y}} \times w_{\text{OM}} + EF_{\text{grid,BM,y}} \times w_{\text{BM}}$$

The CM emission factor for an electricity system Version 02, the default weights of  $w_{\text{OM}} = 0.75$  and  $w_{\text{BM}} = 0.25$  have been applied. The baseline grid emission factor has been calculated as;

$$EF_y = 0.9058 \text{ tCO}_2\text{e/MWh}$$

The baseline emissions thus can be estimated as:

$$BE_y = EG_y \times EF_y$$

The total installed capacity of the project activity is 20 MW with estimated net annual generation of 36199 MWh that will be delivered to NEWNE grid annually. The

estimated electricity generation has been evaluated based on Guidelines for the Reporting and Validation of Plant Load Factors, version 01 EB48, Annex 11. Option 3 (b) the Plant Load Factor determined by a third party contracted by the project participants has been used. Accordingly the third party assessment report provided by Fair Aero Consultant & Technologist dated 18 February 2010 for the project site was reviewed by the validation team. Through the review of report it was confirmed that the generation & PLF are estimated taking the nearest documented C-WET reference met mast of Jaisalmer. For determination of power from power curve of WTG, WAsP software has been used.

The annual average baseline emission are estimated as  $36199 \text{ MWh} * 0.9058 \text{ tCO}_2\text{e/MWh} = 32788 \text{ tCO}_2\text{e}$ .

### **Emission reductions**

The emission reduction from the project activity can be estimated as the difference between the baseline emissions and the sum of project emissions and leakage emissions, as follows:

$$\begin{aligned} \text{ER}_y &= \text{BE}_y - \text{PE}_y - \text{LE}_y \\ \text{ER}_y &= 32788 - 0 - 0 \end{aligned}$$

The average annual emission reduction is 32788 tCO<sub>2</sub>e per year over 10 year fixed crediting period.

Through the validation process LRQA have confirmed that:

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

### **CAR-9**

Stepwise approach to calculate the combined margin emission factor in accordance with the “Tool to calculate the emission factor for an electricity system” was not provided in section B.6.1 of the PDD. Therefore, CAR-9 was raised. The revised PDD now describes all the steps to calculate the emission factor in accordance with the Tool and also the supporting data has been verified by the validation team by cross checking with the CO<sub>2</sub> baseline database version 04. Hence CAR-9 is closed.

### **CAR-10**

Transparent ex ante calculation of project emissions and baseline emissions (or, where applicable, direct calculation of emission reductions) expected during the crediting period, applying all relevant equations, were not provided in section B.6.3 of the PDD. The PDD has been later revised to address the same. Also the validation team has independently verified the emission reduction calculation and found it to be appropriate and hence CAR-10 was closed.

**CL-7**

For the baseline emission calculations, it appeared that an incorrect value of operating margin & build margin emission factor had been used. Also the PLF, assumed to the basis of the estimated generation, was not provided in the PDD. Therefore, CL-7 was raised. The PP later provided a revised emission reduction spreadsheet with calculations of OM, BM and CM as per CEA Baseline database version 04 and generation based on PLF given by Third Party assessment was verified by the validation team and found to be appropriate. Hence CL-7 is closed.

## 4.5 Monitoring methodology and monitoring plan

The project activity applies the monitoring methodology ACM0002 Version 10 for monitoring of emission reduction. In order to monitor the emission reduction by the project activity, the net energy exported by the project activity to the grid is multiplied with grid emission factor. The determination of the grid EF is as described in the above section 4.4 and ex-ante method has been selected by the PP. Therefore, the monitoring plan includes monitoring of electricity exported to grid and electricity imported from grid.

The net electricity exported from project WTGs to the grid is a calculated parameter and is determined by application of the apportion mechanism adopted by Jodhpur Vidyut Vitran Nigam Limited (JVVNL). The monitoring plan for the project activity under section B.7 of the PDD provides the apportion mechanism followed by the JVVNL.

The Jodhpur Vidyut Vitran Nigam Limited (JVVNL) is the certifying agency for joint meter reading which provides the combined export and import values by the common bulk meter located at the substation. Furthermore, the individual generation reading is provided by the O & M contractors. On the basis of both these readings, the net electricity exported to grid is determined for each project promoter.

LRQA undertook an assessment of the monitoring plan envisaged by the project participant in the PDD through an on-site visit to the project activity site. During the site visit, the monitoring arrangements as set out in the PDD, including the management capabilities of the project participant's representatives at the project site to effect the implementation of the monitoring plan, were generally found to be feasible.

It was confirmed that a tri-vector bi-directional meter is used for electricity measurement at the substation and controller meter is used for measurement at the WTG. The electricity measurement is done on a continuous basis and meter readings are recorded every month in the presence of representative from the PP and JVVNL official. The procedure for calibration and maintenance of monitoring equipment are clearly mentioned as per the QA/QC procedure of PDD.

LRQA also concludes that the monitoring plan is implemented in accordance with the requirements specified in the selected baseline and monitoring methodology.

Since the monitoring mechanism was verified during the site visit, the DOE confirms that the monitoring arrangements are feasible within the project design.

All the monitored data will be archived electronically for a period of 2 years after the crediting period.

**CAR-11**

Section B.7.1 of the PDD did not indicate that the data monitored and required for verification and issuance are to be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later. Therefore, CAR-11 was raised. CAR-11 was closed on review of revised PDD which addressed the requirement.

**CAR-12**

The monitoring mechanism adopted at the site and the description of the measurement equipments was not included in the monitoring plan. Therefore, CAR-12 was raised. The revised PDD Version 06 now briefs about the apportioning mechanism followed for the measurement of electricity generated at the project site. The same is found to be appropriate and hence CAR-12 was closed.

## 4.6 Duration of the project activity / crediting period

The PDD mentions the start date of the project activity as 19/08/2008 and the operational lifetime is expected for 20 years. The start date of the project activity and serious consideration of CDM has already been discussed in section 4.2 above.

The PP has selected the 10 years of fixed crediting period and the selected duration of crediting period is acceptable. The lifetime of the activity is 20 years hence, 10 years with no option of renewal can be considered acceptable.

The starting date of crediting period is indicated in the revised PDD as being 01/11/2010 however the crediting period may only start after the date of registration of the proposed project activity as a CDM project activity.

**CL-8**

Project operational lifetime and the length of crediting period were not stated in years and months as per the requirement of guidelines on CDM-SSC-PDD. Therefore, CL-8 was raised. This was addressed in the revised PDD Version 06 and verified by the validation team and CL-8 was closed.

## 4.7 Environmental impacts

Other than the noise that emanates from the WTGs during operation, there are no other known environmental impacts. The LRQA validation team confirmed during the site visit in June 2009 that the WTGs were part of a Wind Farm that was a considerable distance from the residential premises of villagers and, through the interview with the villagers, it was confirmed that noise was not of any concern.

The PP is required to submit to the DOE documentation on the analysis of the environmental impacts of the project activity if required by the host Party. LRQA confirms that no environmental clearance is required for this project as evidenced from Government of India and the EIA notification from Ministry of Environment & Forests (MoEF). It was confirmed that a public hearing and stakeholders' consultation process is not a legal requirement for the project activity. No adverse environmental impacts as well as trans-boundary impacts have been envisaged from this project activity.

## 4.8 Stakeholders' comments

The comments by local stakeholders are to be invited in an open and transparent manner. A summary of the comments received is to be provided to the DOE together with a report indicating how due account was taken of the comments received.

The PP invited the local stakeholders and sought their comments. Stakeholders included the residents of neighbouring villages and village heads. Representatives from the technology supplier were also present during the stakeholder consultation process. Review of the Stakeholder meeting minutes held on 24 December 2008 shows that people were supportive to the project activity and expressed no negative comments on the project activity. As part of the validation, LRQA confirmed through the interviews of local villagers during the site visit that information of the meeting was disseminated through employees of wind farm operators.

During the site visit conducted in June 2009, LRQA met a selection of the stakeholders at the site locations, i.e. Jaisalmer. The stakeholders were mainly villagers, representatives of O&M service providers and government officials from JVVNL. LRQA confirmed that land used for installation of WTG is non-agricultural (NA) land. The stakeholders confirmed their presence in the stakeholder meeting held by the PP and that they had no concerns with respect of the project activity. Rather, some of the stakeholders appreciated the opportunity offered to the local villagers as security guards and commented that due to the installation of such wind projects, road conditions in the area have improved.

LRQA has confirmed that the local stakeholder consultation was adequate with respect of identification of local stakeholders, seeking their views and taking due account of any comments and conducted in a transparent manner.

## 5 Comments by parties, stakeholders and NGOs

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

The PDD was made publicly available in accordance with the requirements of the procedure for the period of 8 May-6 June 2009 as per <http://cdm.unfccc.int/Projects/Validation/DB/AERX8YCUi2RBEAK41JC7IF8SN67G1P/view.html>

One comment was received during the period. The comments received have been taken into consideration as detailed in section 7.4 of this report.

There were a number of changes from the PDD Version 1.0 posted for GSP and the revised PDD version 6, the major points are:

- Latitude and longitude of each of the machines is provided in section A.4.1.4
- Version of the methodology is changed to ACM0002 Version 10 in section B.1
- ER estimate is revised in section A.4.4, B6.3, B.6.4



- Investment analysis is updated
- Changes in common practice analysis in accordance with the requirement of the additionality tool.
- Baseline emission factor is corrected
- The start date of the crediting period is revised
- Procedure for apportioning of EGy is incorporated in section B.7.2

The changes above were to address the issues raised by the validation team in CARs/CLs and resulted in a change in estimated annual average emission reduction of 32,788 tCO<sub>2</sub>e per annum from 35,109 tCO<sub>2</sub>e per annum, a decrease of approximately 6.61%. The decrease in estimated emission reduction is primarily due to application of net electricity generation in accordance with the guideline for plant load factors (EB48, Annex 11) and validation of correct emission factor.

## 6 Validation Opinion

LRQA has undertaken the validation of the proposed project activity “MRMPL Wind Power Project” 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.

In order to arrive at the final validation conclusions and opinion, LRQA carried out a thorough review of the PDD and related information, site visit, interview with the PP, stakeholders and verified the evidences from alternate source and an independent review. Through the process of validation the team has identified 12 CARs and 8 CLs. The PP has taken necessary actions and all the CARs and CLs has been successfully closed out. Overall conclusion for the project activity has been briefly summarised below:

- The PP has correctly applied ACM0002 version 10 to the project activity that involves electricity generation from wind turbine that supplies to an electricity distribution system.
- The NEWNE regional grid is the appropriate project electricity system considered for this CDM project activity. A combined grid emission factor of 0.9058 tCO<sub>2</sub>e/MWh has been validated based on the most recent CEA Database version 4.0.
- The PP was aware of CDM prior to the project start, benefits of CDM were seriously considered at the time of investment decision and that continued and real actions were taken by the PP to secure the CDM status of the project activity. This has been validated on basis of documentary evidences and interviews.
- The validation 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.
- Monitoring plan has been suitably addressed and implementation of the plan by the PP is feasible within the project design.
- There are no significant environmental impacts 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 comments were received during the local consultation process.
- The project activity supports sustainable development criteria of host party as evidenced by the Letter of Approval from Host country.

The validation team is of the opinion that the proposed project activity conforms with 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. Therefore LRQA requests the registration of "MRMPL Wind Power Project" to the CDM Executive Board as a CDM project activity.

**Decision Maker**



Michiaki Chiba

Climate Change Manager, Asia & Pacific

## 7 Appendices

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

Letter of Approval from Ministry of Environment and Forest dated 17 November 2009

### 7.2 Appendix B: List of documents reviewed

#### **Category A documents (documents prepared by the PP)**

1. Project design document, Version 01 date 04/05/09, Version 02 dated 05/10/2009 and Version 03 dated 18/01/2010, Version 04 dated 24/02/2010, Version 05 dated 24/04/2010 and Version 06 dated 14/06/2010
2. Offer from Suzlon Energy Ltd.
3. Technical concept & specification of Suzlon S66 (1250 Kw) WTG
4. Minutes of meeting of Board of Directors of MRMPL dated 15th July 2008
5. Purchase order for the supply of 16 nos tubular tower by Modern Road Makers Pvt Ltd to Suzlon Towers and Structures Ltd. dated 19th August 2008
6. Work order for civil work including foundation & allied works for 16 WTGs by MRMPL to Suzlon Infrastructure Services Limited dated 19th August 2008
7. Work order for erection, installation and commissioning of 16 WTGs by MRMPL to Suzlon Infrastructure Services Limited dated 19th August 2008
8. Work order for arranging lease/sub lease rights of land and suitable access of surroundings for 16 WTGs by MRMPL to Suzlon Infrastructure Limited dated 19th August 2008
9. Purchase order for supply of 16 nos of Suzlon S-66, 1250 Kw rating WTGs without tower dated 19th August 2008
10. Work order for arrangement of adequate common power evacuation for our 16 WTGs by MRMPL to Suzlon Power Infrastructure Pvt Ltd. dated 19th August 2008
11. Work order for electrical works including supply & installation of electrical items, part of renewable energy devices , power transmission and metering devices for 16 WTGs by MRMPL to Suzlon Infrastructure Services Ltd. dated 19th August 2008
12. Purchase order for supply of Transformer, component of renewable energy device/windmill for 16 WTGs by MRMPL to Suzlon Infrastructure Services Ltd dated 19th August 2008
13. Power purchase agreement signed by MRMPL, Suzlon Energy Limited and Jodhpur Vidyut Vitran Nigam Limited dated 15th September 2008
14. Commissioning certificate for the WTG nos R7,R8,R78 and R16 dated 29th September 2008
15. Commissioning certificate for the WTG nos R60,R61,R62,R63,R64,R67,R69,R70,R71,R72,R73,R74 dated 21st January 2009
16. Letter from Electrical Inspectorate Jodhpur for Grant of permission under rule 47(A) & 63 OF Indian Electricity Rules 1956 for energisation of WTG (R67) , R71, R63, R64,R69, R74,R73,R72,R70,R60,R62,R61,R16,R8,R7,R78 at village Dedha dated 18th December 2008, 22nd December 2008, 24th December 2008 and 15th September 2008
17. Letter sent by PP to MOEF dated 10 January 2009 while applying for the host country approval

18. Copy of office memorandum from MOEF for meeting at National CDM Authority dated 13th April 2009
19. Letter sent by PP to UNFCCC giving information about the project activity dated 19 November 2008
20. Copy of email communication/notification to UNFCCC dated 24th November 2008
21. Copy of email communication/acknowledgement from cdmregistration@unfccc.int dated 24th November 2008
22. Copy of notification sent by Suzlon to inform about the local stakeholder consultation dated 10th December 2008
23. Attendance sheet for CDM stakeholder meeting dated 24th December 2008
24. Copy of advertisement published in local daily about the local stakeholder meeting dated 22nd December 2008
25. Minutes of stakeholder meeting dated 24th December 2008
26. Copy of email communication from Ernst & Young to IRB dated 28th August 2008
27. Engagement letter between MRMPL and Ernst & Young Ltd for Climate Change Services dated 3rd November 2008
28. Host Country Approval to MRMPL project dated 17th November 2009
29. Certificate from chartered accountant (A.J.Kotwal & Co.) dated 22nd May 2009
30. Undertaking by PP dated 17/03/2010 for project funding
31. Third Party PLF Assessment report dated 18 February 2010
32. Invoice for the month of December 2008 (from 5 MW wind farm) dated 8th January 2008
33. Daily power generation reports for period 01/12/2008 to 31/12/2008
34. Invoice for the month of November 2008 (from 5 MW wind farm) dated 8th December 2008
35. Joint meter reading report for the month of November 2008 dated 1st December 2008
36. Invoice for the month of September 2008 (from 5 MW wind farm) 24th October 2008
37. Invoice for the month of October 2008 (from 5 MW wind farm) 4th December 2008
38. Joint meter reading report for the month of October 2008 1st November 2008
39. Lease deed -dated 27 August 2008 between M/s Suzlon and Governor of Rajasthan
40. Sub-Lease deed dated 10 August 2009 between M/s Suzlon and M/s Modern Road Makers Pvt Ltd. wherein the PP has acquired the government land by way of a lease for period of 30 years on 27/08/2008

**Category B documents (other documents referenced)**

1. Clean Development Mechanism Project design document form (CDM- PDD)
2. Consolidated methodology for grid-connected electricity generation from renewable sources, version 09 and Version 10
3. Tool to calculate the emission factor for an electricity system" Version 01.1 and Version 02
4. CO<sub>2</sub> Baseline Database for the Indian Power Sector, User Guide Version 4.0
5. Guidelines for completing the Project Design Document (CDM-PDD) and the proposed new baseline and monitoring methodologies (CDM-NM) version 07
6. Guidelines on the Assessment of Investment Analysis (EB41 Annex 45 & EB51 Annex 58)
7. Guidelines on the Demonstration and Assessment of prior consideration of the CDM (version 03)
8. Clean Development Mechanism Validation and Verification Manual

9. Eligibility Criteria for Host Country Approval, National CDM Authority, Ministry of Environment & Forests
10. Notification by Ministry of Environment & Forests dated 14th September 2006
11. Reserve Bank of India (<http://www.rbi.org.in/home.aspx>)
12. Revised list of models and manufacturers of wind electric generators/wind turbine equipment possessing valid approval/certificate (<http://www.cwet.tn.nic.in/Docu/RLMM%20List-24.07.2008.pdf>)
13. Manufacturers-wise wind electric generators installed in India ([http://www.cwet.tn.nic.in/html/information\\_mw.html](http://www.cwet.tn.nic.in/html/information_mw.html))
14. Tariff announced by State Electricity Regulatory commission in the respective states (<http://www.cwet.tn.nic.in/Docu/Tariff-SERC.pdf>)
15. Wind power density map (<http://www.cwet.tn.nic.in/Docu/WPDmap.pdf>)
16. <http://www.windpowerindia.com/statest.html>

### 7.3 Appendix C: List of persons interviewed

Organization/Entity	Name of Person Interviewed
Ernst & Young Ltd	Siddharth Bhasker (Associate Consultant)
	Vishal Bhavsar (Senior Consultant)
IRB Infrastructure Developers Ltd.	Anil Yadav (Deputy Chief Finance Officer)
JVVNL	Vijay Sharma (Incharge, 220/33 KV Substation , GSS Soda Mada )
Suzlon Energy Ltd.	Gaurav Jain (CRM,Jailsalmer )
Villagers of Dedha	Jamnidevi (Stone cutter )
	Yugender Singh (Stone cutter)
	Shaitan Singh

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

The PDD was made publicly available in accordance with the requirements of the Procedures for processing and reporting on validation of a CDM project activity for the period of 8 May -6 June 2009 as per <http://cdm.unfccc.int/Projects/Validation/DB/AERX8YCU12RBEAK41JC7IF8SN67G1P/view.html>

One comment was received during the period. Comments received have been taken into consideration as follows:

Comment	Evaluation & Response
<p>Since the project date is in Aug 2008, the project proponent need to demonstrate the prior CDM consideration by means of a written response from UNFCCC as per the latest guidelines. This information is not provided in the PDD.</p> <p>this needs to be clarified          Submitted by: A.R.Ravi Kumar, rattravanam@yahoo.co.in          Received by DOE:</p>	<p>Since the start date of the project activity is after 02 August 2008, the Guidelines On The Demonstration And Assessment Of Prior Consideration Of The CDM stipulates the below</p> <p><i>“The Board decided that for project activities with a starting date on or after 02 August 2008, the project participant must inform a Host Party DNA and the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status. Such notification must be made within six months of the project activity start date and shall contain the precise geographical location and a brief description of the proposed project activity, using the standardized form F-CDM Prior Consideration.</i></p> <p>The start date of the project is 19/08/2008 and hence accordingly a notification was sent to UNFCCC on 24 November 2008 and the host party DNA was also notified through the application of host country approval on 10 January 2009 (both notifications are made within six months of the start date, it was also confirmed that brief description of the project including the geographic location was provided to UNFCCC and the host country DNA )</p> <p>The notification has not been sent in the standard format since the format was not available as on 24 November 2008. (The</p>

Comment	Evaluation & Response
	<p>guideline was published on 17 July 2009)</p> <p>The UNFCCC secretariat also maintains a publicly available list of such notifications and thus notification dated 24 November 2008 sent by PP for this project was confirmed from the UNFCCC website.</p>

## 7.5 Appendix E: Certificate of Appointment

### Validation of MRMPL Wind Power Project

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.

Prabodha C Acharya  
Shubha Shanbhag  
Andrew Ritchie  
Ketan Deshmukh  
Karuna Moorthy  
Michiaki Chiba

Team Leader/Sector Expert  
Team Member  
Team Member  
Technical Reviewer  
Sector Expert to Technical Reviewer  
Decision Maker

Signed by

**Decision Maker**



Michiaki Chiba  
Climate Change Manager, Asia & Pacific

## 7.6 Appendix F: Validation findings log

Grade 1	Status 2	Finding 3	Corrective action review 4	Process / aspect 5	Date 6	Reference 7	Clause
CAR	Closed	Letter of approval from the host country DNA is not available for validation	The host country approval dated 17 November 2009 has been submitted for validation and has been reviewed by the validation team. Hence CAR1 is closed.	Project Participants/PDD/A.3	6 <sup>th</sup> July 2009	CAR1	Para. 40 (a) CDM M&P
CAR	Closed	The latitude/longitude information provided on page 4 of the PDD does not relate to the co-ordinates of the project site, but instead appear to relate to the co-ordinates of the town of Jaisalmer. The unique identification of the project activity is not adequately addressed in the section A.4.1.4 of PDD; latitude and longitude details for each WTG need to be provided.	The latitude and longitude details of the WTGs provided in the revised PDD were confirmed from the google earth and hence CAR2 is closed.	Project location/PDD/A.4.1.4	6 <sup>th</sup> July 2009	CAR2	Para 40 (a) of CDM M&P and Guidelines for completing CDM-PDD Version 07 (Section A.2)
CAR	Closed	<p>Please include in the description:</p> <p>(1) (a) The scenario existing prior to the start of the implementation of the project activity;</p> <p>(c) The baseline scenario, as identified in section "B.4 Description of how the baseline scenario is identified and description of the identified baseline scenario".</p> <p>If the baseline scenario is the same as the scenario existing prior to the start of implementation of the project activity, there is no need to repeat the description of the scenarios, but only to state that both are the same.</p>	The description now provided in the revised PDD is in accordance with the CDM PDD guidelines and hence CAR 3 is closed.	Project description/PDD/A.2	6 <sup>th</sup> July 2009	CAR3	Guidelines for completing CDM-PDD Version 07 (Section A.2)

Grade 1	Status 2	Finding 3	Corrective action review 4	Process / aspect 5	Date 6	Reference 7	Clause
CAR	Closed	With regard to the description of the technology to be employed by the project activity, whilst there is reference to the main features of WTGs, there is no reference to age and average lifetime of the equipments based on manufacturer's specifications and industry standards. There is no reference to monitoring equipment and their location in the systems.	<p>The age and average lifetime of the WTG is mentioned as 20 years in the revised PDD and the same is considered to be reasonable.</p> <p>The WTG model being installed under the project activity is under C-WET certification, the certification is provided if the WTG meets the specification of TAPS (Type Approval Provisional Scheme) of technical lifetime of 20 years. The technical lifetime mentioned was also verified through comparison with similar project installations of same developer &amp; other major developers and found to be OK. And hence 20 years is considered as reasonable.</p> <p>Also the location of monitoring equipments (main and check meters and their location) is specified in the revised PDD.</p> <p>CAR 4 is closed since the description of technology employed by project activity is now presented in accordance with requirements of the CDM PDD guidelines</p>	Technology description/PDD/A.4.3	6 <sup>th</sup> July 2009	CAR4	Para. 35 CDM M&P and Guidelines for completing CDM-PDD Version 07 (Section A.4.3)
CAR	Closed	Section B.3 of the PDD does not include a flow diagram of the project boundary, physically delineating the project activity and including all the equipment, systems and flows of mass and energy. There is no representation of the emissions sources and gases included in the project boundary and the monitoring variables.	<p>A flow diagram of the project boundary physically delineating the project activity and showing the variables metered and the metering points has been included in the PDD.</p> <p>The flow diagram of the project boundary presented in the revised PDD is in accordance with the requirements of CDM PDD guidelines.</p>	Project Boundary/PDD/B.3	6 <sup>th</sup> July 2009	CAR5	Para. 37 (e) of CDM M&P and Guidelines for completing CDM-PDD Version 07 (Section B.3)

Grade 1	Status 2	Finding 3	Corrective action review 4	Process / aspect 5	Date 6	Reference 7	Clause
CAR	Closed	<p>As the starting date (19/08/2008) of the project activity is before the date of validation (08/05/2009), CDM PDD guidelines version 07 requires the PP to provide an implementation timeline of the proposed CDM project activity.</p> <p>The timeline should include, where applicable, the date when the investment decision was made, the date when construction works started, the date when commissioning started and the date of start-up (e.g. the date when commercial production started). In addition to this implementation timeline project participants shall provide a timeline of events and actions, which have been taken to achieve CDM registration, with description of the evidence used to support these actions.</p>	The implementation timeline has been added in section B.5 of the revised PDD. The supporting evidences for the timelines have been verified by the validation team and hence CAR6 is closed.	Additionality/PDD/B.5	6 <sup>th</sup> July 2009	CAR6	Para. 43 CDM M&P and Guidelines for completing CDM-PDD Version 07 (Section B.5)
CAR	Closed	The investment analysis is not presented in a transparent manner. Also all the relevant assumptions, preferably in the CDM-PDD, or in separate annexes to the CDM-PDD, so that a reader can reproduce the analysis and obtain the same results are not provided.	The relevant assumptions for calculation of the IRR have been included in section B.5 of the revised PDD. Validation team has verified these values and assured that the same set of assumptions are used for financial analysis. CAR7 is closed.	Additionality/PDD/B.5	6 <sup>th</sup> July 2009	CAR7	Para. 43 CDM M&P and Guidelines for completing CDM-PDD Version 07 (Section B.5)
CAR	Closed	Sub step 4a of common practice analysis presented in section B.5 of the PDD refers to other CDM projects which are in various stages of CDM development however 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 revised common practice analysis presented in PDD is in line with the requirements of step 4a and 4b of the additionality tool. The data has also been independently verified by the validation team and hence CAR8 is closed.	Additionality/PDD/B.5	6 <sup>th</sup> July 2009	CAR8	Para. 43 CDM M&P & "Tool for demonstration & assessment of additionality" Version 5.2

Grade 1	Status 2	Finding 3	Corrective action review 4	Process / aspect 5	Date 6	Reference 7	Clause
CAR	Closed	Stepwise approach to calculate the combined margin emission factor in accordance with the "Tool to calculate the emission factor for an electricity system" has not been provided in section B.6.1 of the PDD and it could not be validated how the $EF_{CM,Grid}$ is arrived at 0.9075.	Stepwise approach to calculate the combine margin approach has now been described in the revised PDD and also the relevant baseline for calculation of the same is presented in Annex 3 of the PDD. The revision made in the PDD and data has been verified by the validation team and found to be OK and hence CAR9 is closed.	Methodological choices/PDD/B.6.1	6 <sup>th</sup> July 2009	CAR9	Para.37(d) & 43 CDM M&P & Guidelines for Completing the Project Design Document (CDM-PDD) Section B.6.1 & "Tool to calculate the emission factor for an electricity system"
CAR	Closed	Transparent <i>ex ante</i> calculation of project emissions and baseline emissions (or, where applicable, direct calculation of emission reductions) expected during the crediting period, applying all relevant equations, has not been provided in section B.6.3 of the PDD.	Section B.6.3 has been updated in the revised PDD with the relevant equations used for calculating the baseline emissions, project emissions and emission reductions in the project activity. Hence CAR10 is closed.	Emission Reductions/PDD/B.6.3	6 <sup>th</sup> July 2009	CAR10	Para.37 & 43 of CDM M&P and Guidelines for Completing the Project Design Document (CDM-PDD)
CAR	Closed	Section B.7.1 does not indicate that the data monitored and required for verification and issuance are to be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.	It has been updated in the section B.7.1 that the data monitored and required for verification and issuance will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.  The revised PDD has been modified to address the requirement of CDM PDD Guidelines. Hence CAR11 is closed	Monitoring methodology/PDD/B.7.1	6 <sup>th</sup> July 2009	CAR11	Guidelines for Completing the Project Design Document (CDM-PDD) Section B.7.1

Grade 1	Status 2	Finding 3	Corrective action review 4	Process / aspect 5	Date 6	Reference 7	Clause
CAR	Closed	<p>Related to monitoring of net electricity supplied to grid:</p> <ul style="list-style-type: none"> <li>During the site visit, it was indicated that the current monitoring mechanism in place consists of an energy break-up report generated by Suzlon for each WTG which is then jointly reviewed and signed by authorised representative of Suzlon and Rajasthan State Electricity Board Officials. This then forms as a basis of the credit note/invoice. The section B.7.1 of the PDD however did not elaborate on the process of monitoring adopted as above.</li> <li>The explanation of metering in section B.7.2 is not sufficiently detailed and accurate to form the basis of an effective monitoring plan for future verification. The apportioning mechanism followed at the project site is not briefed under section B.7.1 of the PDD.</li> </ul>	PP has provided a revised monitoring plan describing the monitoring mechanism adopted at the site. The same has been reviewed by the validation team and found to be OK and hence CAR12 is closed.	Monitoring methodology/PDD/B.7.1	6 <sup>th</sup> July 2009	CAR12	Guidelines for Completing the Project Design Document (CDM-PDD) Section B.7.1

Grade 1	Status 2	Finding 3	Corrective action review 4	Process / aspect 5	Date 6	Reference 7	Clause
CL	Closed	<p>A number of editorial issues were identified in the text of the PDD which require rectification:</p> <ul style="list-style-type: none"> <li>Reference is made at the end of section A.2 to Annexure 4. This should be Appendix 1.</li> <li>Please use internationally accepted standard format for values where 1,000 represents one thousand and 1.0 represents one. (A.4.4)</li> <li>In section B.1, ACM0002 is referred to as EB44 – this should be EB45</li> <li>The statement at the top of page 10 refers to 'Tools to demonstrate additionality'; this is incorrect. The calculation of combined margin is defined in 'Tool to calculate the emission factor from an electricity system'.</li> <li>Two copies of the table demonstrating the Project IRR have been included on page 12</li> <li>In section B.6.1 (page15) the following were noted:               <ul style="list-style-type: none"> <li>The link to the footer stated in the text is incorrect</li> <li>There is an incomplete sentence on line 5 of the last paragraph</li> <li>The reference to the '<i>Tools to calculate the emission factor of the grid</i>' should state 'Tool to calculate the emission factor for an electricity system – this is also the case in paragraph 2 on page 17</li> </ul> </li> <li>The first paragraph of E.1 indicates that the local stakeholders meeting took place on 22/12/2008. However the meeting actually took place on 24/12/2008</li> <li>The first bullet point of the last paragraph in section E.1 states MRML instead of MRMPL.</li> </ul>	All the editorial issues have been addressed by the PP in relevant sections of the PDD. The changes have been reviewed by the validation team and hence CL1 is closed.	PDD	6 <sup>th</sup> July 2009	CL1	EB41 Annex 12 Guidelines for Completing the Project Design Document (CDM-PDD)
CL	Closed	<p>Although it is stated in section A.4.5 that "No public funding is available to the project activity from parties included in Annex I", no supporting</p>	Certificate from chartered accountant (A.J.Kotwal & Co.) dated 22 <sup>nd</sup> May 2009 confirms that MRMPL has not received any ODA for their wind power project. Hence	Public Funding/PDD/A.4.5	6 <sup>th</sup> July 2009	CL2	Guidelines for Completing the Project Design

Grade 1	Status 2	Finding 3	Corrective action review 4	Process / aspect 5	Date 6	Reference 7	Clause
		evidence has been made available for validation.	CL2 is closed.				Document (CDM-PDD) Section A.4.5
CL	Closed	PP to clarify why CO <sub>2</sub> emissions due to any electricity consumption in the project activity which is imported from the grid would not been included in the project boundary.	The net electricity imported will be calculated after deducting the electricity imported from the gross electricity generated by the WTGs. The same is a part of the project boundary. The calculation of net electricity exported for the WTGs of MRMPL has been included in the section B.7.2 of the revised PDD. Hence CL3 is closed.	Project Boundary/PDD/B.3	6 <sup>th</sup> July 2009	CL3	Guidelines for Completing the Project Design Document (CDM-PDD) Section B.3 and ACM0002 Version 09

Grade 1	Status 2	Finding 3	Corrective action review 4	Process / aspect 5	Date 6	Reference 7	Clause
CL	Closed	<p>Related to IRR calculations, PP to clarify the following</p> <ul style="list-style-type: none"> <li>Provide the supporting evidence for the income tax, MAT rates, depreciation rate as per companies act (row was hidden in the spreadsheet) and insurance cost assumed in the IRR calculations</li> <li>Please clarify the procedure adopted for tax calculations (considering the negative tax figures in year 13,14 and 15)</li> <li>Please clarify subsidies/ financial incentives availed for the proposed project activity and how they have been accounted in the IRR calculations</li> <li>Why salvage value has not been accounted in the IRR calculations</li> <li>MAT is applied on the taxable income however the same is to be applied on boom profits, please clarify</li> <li>Why IT depreciation is considered as expenses</li> <li>Why land cost is accounted while calculating the depreciation</li> </ul> <p>PDD (page 12) section of Sub Step 2c indicates that <i>'after taking into account the CDM revenues the project IRR is greater than the benchmark which makes the project financially viable.'</i>. However, figures in the accompanying table, and in spreadsheet IRR.CER Sheet for MRMPL Wind Power project indicate that, with CDM revenue, IRR will be 11.9%, which is less than the benchmark (Prime Lending Rate) of 12.25%. Please clarify</p>	<ul style="list-style-type: none"> <li>The supporting evidence for the income tax, MAT rates, depreciation rate and insurance cost has been included in the spreadsheet.</li> <li>The IRR sheet has been revised along with the tax calculations for the clarity of the DOE. IT depreciation has been removed from the expenses and the depreciation has been calculated after removing the cost for land and Erection and Commissioning. MAT has been applied on the book profits as per the requirement.</li> <li>The components will depreciate completely before the lifetime of 20 years and hence no salvage value is considered.</li> <li>No subsidies/financial incentives have been availed for the project activity.</li> <li>The comment of Sub Step 2c which states that <i>'after taking into account the CDM revenues the project IRR is greater than the benchmark which makes the project financially viable'</i> has been changed accordingly.</li> </ul> <p>Hence CL4 is closed.</p>	Additionality/PDD/B.5	6 <sup>th</sup> July 2009	CL4	Guidelines for Completing the Project Design Document (CDM-PDD) Section B.5 and 'Tool for the demonstration and assessment of additionality' (version 05.2)

Grade 1	Status 2	Finding 3	Corrective action review 4	Process / aspect 5	Date 6	Reference 7	Clause
CL	Closed	<p>Related to sensitivity analysis</p> <ul style="list-style-type: none"> <li>Although spreadsheet for the IRR calculation has been provided the spreadsheet for the figures quoted in the Sensitivity Analysis Table (pages 12 &amp; 13 of PDD) has not been provided for validation.</li> <li>PP to clarify, why O&amp;M cost and initial investment cost will not be subjected to sensitivity analysis.</li> <li>Page 13 of the PDD indicates that with 10% decrease and increase in O&amp;M escalation charges there is no impact on the project IRR which is incorrect</li> </ul> <p>Page 14 of the PDD indicates that with 10% decrease and increase in tariff rate there is no impact on the project IRR which is incorrect</p>	The revised sensitivity analysis results have now been provided in the revised PDD. Also O&M and project cost has now been subjected to the sensitivity analysis. The analysis has been reviewed by the team and found to be OK and hence CL5 was closed.	Additionality/PDD/B.5	6 <sup>th</sup> July 2009	CL5	Guidelines for Completing the Project Design Document (CDM-PDD) Section B.5 and 'Tool for the demonstration and assessment of additionality' (version 05.2)
CL	Closed	<p>In undertaking the Common Practice Analysis, the client has referred to data provided by the Ministry of New and Renewable Energy Annual Report 2007-8, specifically Table 5.1. The percentages presented in Table 1 for Sub Step 4a (page 14) do not appear to be correct. Refer <a href="http://mnes.nic.in/annualreport/2007_2008_English/Chapter%205/chapter%205_1.htm">http://mnes.nic.in/annualreport/2007_2008_English/Chapter%205/chapter%205_1.htm</a></p> <p>Also specify the source of data relating to the 31/01/2008 figures for total generation in India, as well as the Wind Power Potential (MW) figures for India and Rajasthan.</p>	The common practice analysis now presented in revised PDD is in line with the requirements of step 4a and 4b of the additionality tool. Also the data presented in verified independently by the validation team and hence CL6 is closed.	Additionality/PDD/B.5	6 <sup>th</sup> July 2009	CL6	EB41 Annex 12 Guidelines for Completing the Project Design Document (CDM-PDD) Section B.5 and 'Tool for the demonstration and assessment of additionality' (version 05.2)

Grade 1	Status 2	Finding 3	Corrective action review 4	Process / aspect 5	Date 6	Reference 7	Clause
CL	Closed	<p>As part of the calculations of baseline emissions (<math>BE_y</math>) as part of the ex-ante calculations of emission reductions (pages 16 &amp; 17), reference is made to the value of the operating margin <math>CO_2</math> emission factor as 1.01. This appears to be the value for NEWNE in the year 2006-2007, as stated in the <math>CO_2</math> Baseline Database, version 4.0. The value of the build margin <math>CO_2</math> emission factor is stated as 0.60, which appears to be the value for NEWNE for 2007-2008. Please clarify this discrepancy.</p> <p>In addition, the PP is requested to clarify why the value of emission reductions stated (35109 tonnes of <math>CO_2</math> per annum) does not relate to <math>EG_y (41600) \times EF_{Grid,CM,y} (0.9075)</math>. Also clarify the PLF assumed to derive the figure "41600" MWH of net electricity export since using the PLF as given by the technology supplier the figure comes out to be 41119 MWH.</p>	Revised emission reduction spreadsheet with calculations of OM, BM and CM as per CEA Baseline database version 04 and generation based on PLF given by Third Party assessment is verified by the validation team and found to be acceptable. Hence CL7 is closed.	Emission Reduction/PDD/B.6.3	6 <sup>th</sup> July 2009	CL7	Guidelines for Completing the Project Design Document (CDM-PDD) Section B.6.3 and "Tool to calculate the emission factor of an electricity system"
CL	Closed	Project operational lifetime and the length of crediting period is not stated in years and months	The project operational lifetime has now been stated in years and months and hence CL9 is closed.	Project operational lifetime/PDD/C.1.1	6 <sup>th</sup> July 2009	CL8	Guidelines for Completing the Project Design Document (CDM-PDD) Section C.1.1