Validation Report

Report for:

Powerica Limited

Validation of CDM project for

Wind power project at Theni by Powerica Limited

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Contents

1 Executive Summary 3

2 Introduction 6

2.1 Objective 6

2.2 Scope 6

2.3 GHG Project Description 7

3 Methodology 7

3.1 Review of documents 7

3.2 Site Visit and Follow-up interviews 8

3.3 Resolution of clarification and corrective action requests 8

3.4 Internal quality control 8

4 Validation protocol and conclusions 8

4.1 Participation requirements 9

4.2 General description 10

4.3 Baseline methodology 12

4.4 Emission reductions 24

4.5 Monitoring methodology and monitoring plan 28

4.6 Duration of the project activity / crediting period 29

4.7 Environmental impacts 30

4.8 Stakeholders' comments 30

5 Comments by parties, stakeholders and NGOs 31

6 Validation Opinion 32

7 Appendices 34

7.1 Appendix A: Letter of approval for the project by the host and investing country DNA 34

7.2 Appendix B: List of documents reviewed 34

7.3 Appendix C: List of persons interviewed 35

7.4 Appendix D: How due account has been taken to the public input made to the validation requirements 36

7.5 Appendix E: Certificate of Appointment 40

7.6 Appendix F: Validation findings log 41

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1 Executive Summary

Lloyd's Register Quality Assurance Limited has been contracted by Powerica Ltd., the project participants (PP), to undertake validation of the proposed project activity "Wind power project at Theni by Powerica Limited". The validation has been performed through a process of document review based on the project design document, Version 01.2 dated 01/09/2010 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 utilising wind resource to generate electricity in the state of Tamil Nadu, India by the installation of 6 wind turbine generators (WTG) in Theni, Tamil Nadu. The electricity generated by the project activity will be supplied to the Southern Grid of India. It will reduce the impact of power generation from the conventional fossil fuel based power plants, thereby leading to reduction of GHG emissions.

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

The validation team has found through the validation process 4 CARs and 7 CLs. The PP has taken actions and submitted to LRQA project agreements, commissioning certificates, Power Purchase agreements, revised financial analysis including cash inflow from tax savings, and a revised PDD, correcting the monitoring plan. The validation team is of the opinion that the proposed project activity as described in the project design document Version 03 dated 01/03/2011 meets all the relevant UNFCCC requirements for the CDM, as well as the host country's national requirements and, if implemented as designed, is likely to achieve the emission reductions and contribute to the sustainable development of the host country. LRQA therefore requests the registration of "Wind power project at Theni by Powerica Limited" to the CDM Executive Board as a CDM project activity.

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Abbreviations

BE	Baseline emissions
BM	Build Margin
BSE	Bombay Stock Exchange
CAGR	Compounded Annual Growth Rate
CAPM	Capital Asset Pricing Model
CARs	Corrective action requests
CDM	Clean development mechanism
CDM-EB	Executive board of clean development mechanism
CDM M&P	Modalities and procedures for a clean development mechanism
CDM VVM	CDM Validation and Verification Manual
CEA	Central Electricity Authority
CEIG	Chief Electrical Inspector to Government
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
EPA	Energy purchase agreement
ERPA	Emissions reduction purchase agreement
FAR	Forward action requests
GHG	Greenhouse gas
GSP	Global stakeholders' consultation process
HTSC	High Tension Service Connection
IPCC	Intergovernmental panel on climate change
IREDA	Indian Renewable Energy Development Agency
IRR	Internal rate of return
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
NCDMA	National Clean Development Mechanism Authority
NCV	Net calorific value
NGO	Non governmental organisation
ODA	Official development aid
OM	Operating Margin
O&M	Operation and Maintenance
PDD	Project design document
PE	Project emissions
PLF	Plant Load Factor
PP	Project participant
RBI	Reserve Bank of India
tCO_2e	Tonnes of carbon dioxide equivalent
TNEB	Tamil Nadu Electricity Board

TNERC	Tamil Nadu Electricity Regulatory Commission
UNFCCC	United Nations Framework Convention on Climate Change
WACC	Weighted Average Cost of Capital
WTG	Wind Turbine Generator

2 Introduction

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

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

Ankush Jain	LRQA Ltd., India	Team leader, CDM Lead Validator, Sector expert
Ponnada Rama N Rao	LRQA Ltd., India	Team member, CDM Validator
Dave Mateo	LRQA Ltd., Japan	Team member, CDM Validator
Imran Ustad	LRQA Ltd., India	Trainee – Technical reviewer
Prabodha C Acharya	LRQA Ltd., India	Technical reviewer, Sector Expert
Andrew Ritchie	LRQA Ltd	Decision maker

Personnel being engaged in a CDM project validation are qualified based on the established procedures of LRQA to assure the resource requirements satisfy all the requirements of the competence criteria of the latest version 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

Powerica Limited, manufacturer of diesel power generator sets, is involved in the installation of 9.9MW wind power project (6 × 1.65MW) located at Theni in the state of Tamil Nadu, India. The electricity will be sold to the Southern grid for which PP has entered into an Energy Purchase Agreement (EPA)[1] with state utility Tamil Nadu Electricity Board (TNEB).

The exported electricity from the project activity will displace equivalent electricity from the Southern grid which is primarily fossil fuel based and hence will result in reduced greenhouse emissions. The validation team confirms that the Wind Turbine Generators (WTGs) of Vestas of capacity 1.65 MW are based on a proven technology used elsewhere in the host country for electricity generation using wind energy.

The project activity is categorised in the sectoral scope 1 – Energy industries (renewable/non-renewable sources). The output capacity of the proposed project activity is 9.9 MW and it meets the criteria of Type I of the small scale CDM project activities (SSC).

The estimated GHG emission reduction is 22,798 tCO_2e per annum during the renewable crediting period of 7 years. The emission reduction has been estimated based on the ex-ante plant load factor (PLF) study report provided by an independent third party.

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 01.2 dated 01/09/2010 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 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 PDD Version 03 dated 01/03/2011 to confirm that all changes agreed had been incorporated.

[1] Also commonly known as Power Purchase Agreement (PPA). The terms PPA and EPA are used interchangeably in this report.

3.2 Site Visit and Follow-up interviews

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

Date	Month, Year	Party, Location
19	October, 2010	Vestas wind farm, Theni
		Meeting with O&M service provider
		Meeting with Local Villagers
		Meeting with Tamil Nadu Electricity Board
20	October, 2010	Powerica Ltd, Corporate office, 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 authorised decision maker were conducted prior to the submission of the validation report to the PP and prior to requesting the registration of the project activity.

4 Validation protocol and conclusions

This section provides an overview of the validation activities undertaken by LRQA in order to arrive at the final validation conclusions and opinion. It includes a general discussion of details captured by the validation protocol (which is based on the Clean Development Mechanism Validation and Verification Manual version 01.2) 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.

In accordance with CDM-EB 50 Annex 48, LRQA confirms that it has entered into a contractual agreement with Powerica Limited for performing the validation and Powerica Limited is the sole project proponent at the time of completion of this report.

The host Party of the proposed project is India. India ratified the Kyoto Protocol on 26 August 2002. The Designated National Authority (DNA) is the National Clean Development Mechanism Authority (NCDMA) established in the Ministry of Environment and Forests (MoEF).

The project has currently been proposed as a unilateral CDM project and the Annex I Party has not yet been identified. In line with the provision of paragraph 57 of the 18th meeting of the CDM-EB, registration of a project activity can take place without an Annex I party being involved at the stage of registration.

The information of the DNAs has been confirmed by the validation team against the relevant information on the UNFCCC CDM website[2]. A letter of approval (LoA) from the host Party's DNA dated 15 November 2010, Ref: 4/14/2010-CCC was made available by the PP.

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-E, 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.

[2] http://cdm.unfccc.int/DNA/index.html

The LoAs were noted as unconditional with respect to the above elements. The copy of the LoA was verified against the original LoA issued by the host country DNA. 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. Therefore, the team has confirmed the authenticity of the letters issued.

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

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

CAR 01 was initially raised as the LoA from the DNA of the host country was not presented at the initial stage of the validation. However, the CAR has been closed as the LoA from the host country has been presented to the validation team. (ref Appendix F: Validation findings log of this report).

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

4.2 General description

Project design document

The PDD was checked and confirmed as complete against the Guidelines for completing the simplified project design document (CDM-SSC-PDD) and the form for proposed new small scale methodologies (CDM-SSC-NM) referring to the latest version (Version 05, Annex 09 to 34th meeting of CDM-EB) applicable to the validation.

A valid form of the CDM-SSC-PDD (Version 03, Annex 34 to 28th meeting of CDM-EB) is used, being the current form available on the CDM website.

Project description

The objective of the project activity is to utilise the wind energy for generation of electricity. The project activity involves the installation of 6 WTGs each having a capacity of 1.65MW of Vestas make and are located at Theni district of Tamil Nadu State of India.

The expected annual generation from the project activity is 26,185 MWh as presented by the supplier in Quotation. The PP has further contracted an independent third party, AWS True Power, to estimate the electricity generation from the project activity. The technical consultant has presented total generation as 24,138 MWh annually through the study of wind mast data. The evidence was found to be in line with the guidelines for assessment of plant load factor provided in Annex 11 of 48 meeting of CDM-EB. The Plant Load Factor (PLF) was compared with similar projects operating in the region and found to be within the acceptable range. The PP has further considered higher generation figures for assessing additionality and lower generation figures as per the study report of the third party engineering company for determining ex-ante emission reduction estimates. The validation team is of the opinion that from the approach mentioned above it will be conservative for determination of additionality as well as estimation of ex-ante emission reduction.

The electricity generated from the project activity will be exported to the Southern grid of India on the basis of Power Purchase Agreements (PPA) signed between Powerica and TNEB. 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 in the PDD and the project design details were cross checked with the technical agreements, technical specifications, land sale deeds, PPA, commissioning certificate, interview and field survey.

During the validation process **CL 01** was raised as the unique identification of the WTGs related to the project activity has not been mentioned in the PDD, Version 01.2. In response to the finding, the PP has included the High Tension Service Connection (HTSC) number as unique identification of the project activity. The validation team has reviewed the PPA, and commissioning certificate to confirm the HTSC number presented in the PDD are correct. Therefore, the finding was closed. (ref Appendix F: Validation findings log of this report).

CL 02 was initially raised as there was inconsistency in the value of rated wind speed mentioned in the quotation and section A.4.2 of the PDD, Version 01.2. In response to the finding, the PP has corrected the PDD which now consistently refers to the rated wind speed as 13m/s. The validation team checked that the rated wind speed is correct and consistent with the quotation, the technical specification and from the interview of site official of Vestas. Therefore, the finding was closed. (ref Appendix F: Validation findings log of this report).

Sustainable development

The project activity supports the sustainable development criteria of the host country. The validation team reviewed the four indicators for sustainable development defined by NCDMA viz. – environmental well being, economic well being, social well being and technological well being. Justification in the PDD with respect to each of these indicators was considered appropriate.

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

Small scale CDM criteria

This project generates renewable energy that displaces electricity from the electricity grid system. The project involves installation of six turbines each of 1650KW capacity aggregating to 9.9 MW which is less than 15MW. From the interview of PP, the validation team has confirmed that the PP does not intend to increase the generation capacity of this project.

The validation team confirmed that the total size of the project will remain under 15MW, the limits of small-scale project activity Type I "Renewable energy project activities with a maximum output capacity equivalent to up to 15 MW (or an appropriate equivalent)" during every year of the crediting period. Hence, LRQA confirms that the project

activity satisfies the criteria set out for use of the SSC M&P with respect to Type I activities.

Public funding
Based on the review of financial information furnished by the PP, it has been confirmed that the project activity is funded solely through equity. The PP has further presented a self declaration confirming no funding from Official Development Aid (ODA). LRQA therefore confirms that there is no funding from an ODA.

De-bundling
During the interview of the PP, it was confirmed that the wind projects installed by the PP are 16.5MW capacity at Tirunelveli in Tamil Nadu and; 14.85 and 4.8MW at Gujarat. These projects are outside the 2km radius of the project activity located at Theni in Tamil Nadu. This has been confirmed through the wind power directory 2009 and CDM website http://cdm.unfccc.int/.

Hence, LRQA confirms that the project activity satisfies the criteria of de-bundled activity and hence can be accepted as a small scale CDM project activity.

4.3 Baseline methodology

Application of baseline and monitoring methodology
The project activity applied the approved baseline and monitoring methodologies: AMS.I.D, Version 16 "Grid connected renewable electricity generation". LRQA confirms that AMS.I.D Version 16 is the currently active version of the methodology at the time of submission of the project for registration.

The methodology is applicable to the grid connected renewable power generation project activities involving electricity capacity additions that include installation of wind power plant/unit. 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 small-scale methodology AMS.I.D, Version 16 and the "Tool to calculate the emission factor for an electricity system", Version 02 referred to in the approved methodology. The summary of the applicability criteria is listed below:

- The project involves the installation of a new wind power plant/unit. LRQA has confirmed this through the review of supply contract dated 30/06/2010 between Powerica Limited and Vestas Wind Technology Pvt. Ltd. and from the field survey.
- The electricity generated by the project activity substitute grid electricity. The electricity generated from the WTG will be exported to the connected Southern regional grid which is dominated by fossil fuel based power plants. LRQA has confirmed through the review of PPA, review of the CO_2 baseline database, Version 05, interview and field survey.
- The wind power project does not involve switching over from fossil fuel to renewable energy sources at the site of the project activity. LRQA confirmed that the project is a new installation of wind based electricity generation.
- The total capacity of the project is 9.9MW which is below 15MW threshold. LRQA confirmed this through the investment decision, supply agreement, commissioning certificate and PPA.

The validation team has assessed the applicability requirements and cross-verified with the supporting information and interviewed the PP, technology supplier and found the applicability conditions of the methodology AMS.I.D, Version 16 are satisfied by the project activity.

Project boundary

According to the CDM Glossary, the project boundary for small-scale CDM project activity shall be limited to the physical project activity. Project activities that displace energy supplied by external sources shall earn certified emission reductions (CERs) for the emission reductions associated with the reduced supply of energy by those external sources.

The project boundary encompasses the physical and geographical site of the renewable energy source and displaced fossil fuel based power plant sources in the connected grid. This is in line with the paragraph 9 of the applied methodology. The project boundary has been validated through the review of land clearances, supply agreement, land sale deed, commissioning certificate, interview and field survey. This information was substantiated via cross check with the CO_2 baseline database version 05 which is the latest version available at the time of submission of the PDD for validation.

Through the processes taken, the validation team confirmed that the identified project boundary, selected sources and gases were justified for the project activity and meet the requirements of the approved methodology and clause 78 of VVM (Version 01.2).

Baseline scenario

The PP has presented grid as the baseline scenario in accordance with the applied methodology AMS.I.D, Version 16 and found this to be in accordance with the requirements as per clause 105 of the VVM (version 01.2).

According to AMS.I.D Version 16, the baseline for the project activity is the MWh of electricity produced by the renewable generating unit. The baseline scenario is the electricity delivered to the grid by the project activity that otherwise would have been generated by the operation of grid-connected power plants and by the addition of new generation sources. The baseline emissions are the electricity produced by the renewable generating unit multiplied by an emission factor (measured in kg CO_2e/kWh) calculated in a transparent and conservative manner as:

(a) A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the 'Tool to calculate the emission factor for an electricity system'.

OR

(b) The weighted average emissions (in kg CO_2e/kWh) of the current generation mix. The data of the year in which project generation occurs must be used.

The PP has decided to use Option (a) of the above.

The statements in the PDD were cross-checked with technical agreements for new-grid connected power plants, power purchase agreements, commissioning certificate, User Guide for CO_2 Baseline database for Indian Power Sector, Version 05 and follow-

up during site visit.

It was noted that the PDD Version 01.2 does not specify the baseline scenario but only states the baseline emissions. Therefore, **CAR 02** was raised. In response to the finding, the PP has revised the PDD, correctly including the baseline scenario. The validation team has verified the description with that mentioned in the approved small-scale methodology, AMS.I.D, Version 16. Therefore, the finding was closed. (ref Appendix F: Validation findings log of this report).

The validation team confirms that:

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

Additionality

The project additionality was demonstrated by the PP through the "Information on additionality" as mentioned in the attachment A to the appendix B of the simplified modalities and procedures for small-scale CDM project activities.

The PP has demonstrated the financial unattractiveness of the project activity through investment barrier for which the PP has applied benchmark analysis.

Investment decision:

The PP presented extracts of the Board meeting held on 02/06/2010. The meeting minutes recorded that the 'internal rate of return is lower than the expected rate of return' and 'CDM will help in improving the financial viability of the project'.

To determine the authenticity of the documents presented, LRQA made a special visit on 20/10/2010 to the corporate office of Powerica Limited and confirmed that the minutes of the board meetings were maintained in a bound manuscript. Pages of minutes were duly attested by the Chairman in accordance with the requirements of The Companies Act, 1956. The meeting minutes were in continuation to several board decisions taken in other meetings and each of the meeting minutes commenced with the attendance of the board members. The visit confirmed that the extracts of the Board meeting presented were actual extracts from the board meeting minutes held.

Investment barrier

PP has presented investment barrier for the project using benchmark analysis. Internal rate of return (IRR) is calculated for the project by estimating the project cash flows from the project. The assumptions/input values used for investment analysis have been validated.

Appropriateness of the benchmark

As per the 'Guidelines on the assessment of investment analysis' (Version 03.1), in the cases of projects which could be developed by an entity other than the project participant, the benchmark should be based on publicly available data sources which can be clearly validated by the DOE. Such data sources may include local lending and borrowing rates, equity indices, or benchmarks determined by relevant national authorities.

Since no loan has been taken by the PP, the equity IRR is equal to the project IRR and weighted average cost of capital (WACC) is equal to cost of equity. The validation team has confirmed that no loan has been taken for the project through the interview of the PP. The validation team has also confirmed the leverage rate from the PP's earlier investments in wind power projects[3] . This is in accordance with paragraph 11 of 'Guidelines on the assessment of investment analysis' (Version 03.1). The cost of equity is calculated from the publicly available information.

Cost of equity based on the Capital Asset Pricing Model (CAPM) method is calculated with the help of the following formula:
Re = Rf +B (Rm-Rf)

Where,

Re	- Expected return on the equity
Rf	- Risk free rate of return
Rm	- Expected market returns
B	- Beta
(Rm-Rf)	- Market risk premium

LRQA further validated the following components of CAPM:

Risk free rate of return (Rf):

The risk free rate is the return that is assured on capital investment. Essentially, these are the financial instruments for investment without any default risk. In case of India, the Government of India bonds or securities are considered as the most suitable representative for calculation of risk free rate in the market. LRQA confirmed that the returns on Central Government securities (as verified from the official website of the Reserve Bank of India[4]) averaged 8.12% during the year 2008-09. This was taken from the latest publication of RBI titled, "Handbook on Statistics on Indian Economy" (Sep 2009) available at the time of investment decision. This source for risk free rate of return is also inline with their other investment decisions in wind power projects.

Market rate of return (Rm)

The market rate of return has been based on the publicly available stock index, BSE-SENSEX. BSE-SENSEX is the major index of India that is being monitored at the international market. The index consists of 30 large companies, based on their market capitalisation. The index can therefore be considered as relatively stable with low

[3] CDM registered project, Ref: 3327 and 3632

[4] http://rbidocs.rbi.org.in/rdocs/Publications/PDFs/87503.pdf

random fluctuations, and it is reasonable to refer to BSE-SENSEX for determining the average market return.

The average market return has been calculated with the help of the Compound Annual Growth Rate (CAGR). The CAGR gives the measure of the average returns from the stock market investments over a period of time. It is a more accurate measure than simple average of returns and is calculated as:

CAGR = (index value at end/ index value at beginning) (1 / no. of years) – 1

For calculation of CAGR, the "index value at the beginning" is taken from the year 1978-79 which is the base year[5] (the corresponding value is 100) and the "index value at end" is the lowest value (lowest value is conservative) of the index as available at the time of investment decision, i.e. 31 May 2010.

LRQA confirms the calculation for market rate of return as 18.63% at the time of investment decision is appropriate.

Beta (B)

Beta is the measure of risk of a specific sector/company. The beta of the power sector can be applied as proxy risk profile for the project activity for determination of Cost of Equity. The Beta in the CAPM equation helps account for the systematic risk by quantifying the sensitivity of the stock of a listed company representing a particular project type/sector with the market returns.

The project proponent has arrived at the beta value of 0.5917 which is the minimum of the beta values of seven companies in the power sector. The beta value has been calculated by regression analysis of the stock price with the index value for a period of five years. The comparison of five years is appropriate as it considers the impact of recent trends, and errors due to past trends have been removed. For the purpose of completeness of the benchmark analysis, LRQA has compared the beta value for all the major power companies listed in the power sector index of BSE and confirms that the beta presented by the PP is conservative.

During the review it was noted that PP had earlier used benchmarks of 14.4% and 14.76% respectively for similar project activities[6] and has considered a benchmark of 14.34% for this project activity. The validation team has reviewed the benchmark calculation and confirms that the same calculation approach has been used for benchmark calculations and the information used is the most recent available at the time of investment decision. LRQA confirmed that the benchmark has been updated based on most recent information available at the time of investment decision.

The benchmark calculated for the project activity is 14.34% and is reasonable and acceptable.

Internal Rate of Return:

LRQA validated the timings of the investment decision taken by the project proponent (refer the section "Investment decision") and the consistency and appropriateness of the input values with the timing of the investment decision. The listed input values from

[5] http://www.bseindia.com/about/abindices/bse30.asp

[6] Please refer PA 3327 (that used a benchmark of 14.4%) and PA 3632 (that used a benchmark of 14.76%)

the quotations, as presented in section B.5 of the PDD, have been consistently applied in the financial calculations.

The IRR was calculated for a period of 20 years, which reflects the period of expected operation of the underlying project activity (technical lifetime) and hence was found to be appropriate. The technical life time of the WTG was confirmed through a certificate from the WTG supplier and was found to be appropriate. This is in accordance with the guidance 3 of the 'Guidelines on the investment analysis'.

LRQA has further confirmed that the PP has not considered any loan for the project activity. This has been confirmed through the interview of the PP.

The major input parameters have been listed below along with the validation opinion on the suitability of values:

S. No.	Parameter	Value	Opinion
1	Vestas WTGs (1.65MW)		
1.1	Number	06	Considered from the investment decision of the PP. The number has been confirmed from the following sources: 1. Quotation submitted by Vestas dated: 31/05/2010 2. Supply agreement with Vestas dated: 30/06/2010 3. Commissioning certificates dated: 13/09/2010, 17/09/2010 4. Power Purchase Agreements with TNEB dated: 13/09/2010 & 17/09/2010
1.2	Capacity	1.65 MW	Considered from the investment decision of the PP. The value has been confirmed from the following sources: 1. Quotation submitted by Vestas dated: 31/05/2010 2. Supply agreement with Vestas dated:30/06/2010 3. Commissioning certificates dated: 13/09/2010, 17/09/2010, 4. Power Purchase Agreements with TNEB dated: 13/09/2010 Installed capacity of the WTG and number of wind energy generators included in the project were also confirmed during the site visit.
1.3	Annual net generation	26,184 MWh	Electricity generation figure of 26,184 MWh (PLF of 30.19%) has been considered from the quotation submitted by Vestas

S. No.	Parameter	Value	Opinion
			dated: 31/05/2010. Electricity generation has also been verified from the following sources: 1. Copy of "Powerica Limited Long-Term Wind Speed and Energy Production Estimates" prepared by AWS Truepower dated: 30/07/2010, technical report from independent third party mentions a lower generation estimates of 24,138MWh/annum. Since the PP had considered a higher PLF based on the quotation/ proposal from the technology supplier, a higher value is considered for investment analysis, which is conservative. 2. PLF has also been confirmed from the Tariff order of Tamil Nadu Electricity Regulatory Commission dated: 20/03/2009 [7]. The average PLF for Tamil Nadu has been mentioned as 27.15%. Further, Tamil Nadu Energy Development Agency (TEDA) mentions PLF of 25-30% 3. PLF is wind farm specific; therefore comparison with similar wind farms is more appropriate. The projects located in Tamil Nadu have been compared and it was found with similar registered projects that the PLF varies from 25.62% to 32%. (Ref: 2813, 2339, 2770, 2679, 3710, 3884, 3981, 4209) **Validation Opinion:** Therefore, ex-ante PLF of 30.19% mentioned in the quotation is considered appropriate and conservative for additionality assessment.
1.4	Total project cost	654.576 Million INR	Project cost has been considered from the quotation submitted by Vestas dated

[7] http://tnerc.gov.in/orders/draft%20order%2020-3-2009%20complete%20final.pdf

S. No.	Parameter	Value	Opinion
			31/05/2010. The specific project cost is 66.11 Million INR/MW. Project cost has also been cross verified from the following sources: 1. Supply agreements with Vestas dated: 30/06/2010 noted to be for INR 60.05 Million INR which is 9.1% lower than that mentioned in the Quotation. The impact of lower actual value is covered in the sensitivity analysis below. 2. Comprehensive tariff order for wind energy dated: 20/03/2009 section 7.2 (page 14) states capital cost is of the range 45 to 68.5 Million INR/MW. Capital investment considered is 66.11 Million INR/MW. 3. The project cost is dependent on the prevailing economic and market conditions and therefore dependent upon the time of the investment decision and the prevailing economic policies of the state. Compared with similar registered projects (Ref: 2813, 2770, 2679, 4209, 3884, 3710, 3981, 2365) where cost per unit capacity varies from 60.6 to 81 Millions/MW, and the unit cost of the project activity is 66.11 Million INR/MW. **Validation opinion:** The total project cost considered is thus valid and applicable at the time of investment decision by the PP. The total project cost considered is appropriate and reasonable.
1.5	Annual O&M cost	2.2 Million INR/WTG	O&M cost and its escalation has been taken from Quotation submitted by Vestas dated: 31/05/2010. Validation team further verified the actual contracted cost from the Service and Availability agreement which mentions a
1.6	Escalation in O&M cost	7.5%	

S. No.	Parameter	Value	Opinion
			lower figure of INR 1.675 Millions/WTG from 3rd year with an escalation of 5% applicable from 4th year onwards. Though the actual O&M cost is lower than that which was available at the time of investment decision, it was noted that the project return does not cross the benchmark, even after considering O&M cost to be zero. Hence, the O&M cost considered for the financial analysis, based on the proposal from the technology supplier, is deemed to be reasonable.
1.7	Tariff rate	3.39 INR/kWh	LRQA confirmed from the TNERC tariff order [8] dated 20/03/2009 that the tariff rate of INR 3.39/kWh is applicable for the WTGs commissioned after 01/04/2009. The validation team had cross checked with the wind energy purchase agreement dated 13/09/2010 & 17/09/2010 signed between the PP and TNEB which confirms the tariff rate of INR 3.39/kWh for 20 years without any escalation.
2	Depreciation rate as per Income tax act	80%	In accordance with the local laws. Ref: Section 32 of Income Tax Act 1961
3	Corporate tax	33.22%	In accordance with the local taxation laws[9]. Tax rate is calculated as base rate with 7.5% surcharge and 3% education cess. Base rate for corporate tax is 30% and Minimum alternate tax is 18% for the financial year 2010-11. Hence, the final figures are 33.22% and 19.93% for corporate tax and minimum alternate tax respectively. Ref: Income tax act 1961
4	Minimum alternate tax	19.93%	

[8] http://tnerc.gov.in/orders/draft%20order%2020-3-2009%20complete%20final.pdf

[9] http://indiabudget.nic.in/ub2010-11/bh/bh1.pdf (Section: 'Direct taxes' Page 9/14)

It should be noted that the Quotation has not presented the cost of land. The value of land cost per WTG has been assumed by the PP to be the same as for their earlier project (Ref: 3327) in Tamil Nadu. LRQA has assessed the suitability of the land cost through the actual land purchase agreements. 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[10] of the host country.

It was noted that investment decision was taken on 02 June 2010 as recorded in the company's Board minutes. It was further confirmed from the interview of the PP that the Vestas' quotation dated 31 May 2010 and TNERC tariff order dated 20 January 2009 were presented to the Board. The actual investment in the project was taken from 30 June 2010 (Supply agreement) to 17 September 2010 (Power Purchase Agreement). Due to very small time gap in proposal and real action for the project activity, the validation team is of the opinion that input values would not materially change.

IRR was calculated for a period of 20 years, in line with the guidance 3 of 'Guidelines on the Assessment of Investment Analysis' and hence was found to be appropriate. Further, LRQA confirms that the salvage value (fair value of any project activity assets at the end of the assessment period) has been added back as cash inflows in accordance with guidance 4 of 'Guidelines on the Assessment of Investment Analysis'

Further, LRQA confirms that the tax calculation considers benefit under section 80 IA[11] of the Income Tax Act under which such projects are entitled to a tax holiday for 10 consecutive years out of the first 15 years.

In accordance with guidance 5 of 'Guidelines on the assessment of investment analysis', LRQA confirms that the depreciation has been added back to net profits for the purpose of calculating the IRR.

It was confirmed by the validation team from the available evidence and relevant accounting practices that in the estimation of the post tax IRR, the PP had applied the accepted local accounting and taxation principles. The PP had presented the unprotected spreadsheet versions of all investment analysis, having readable formulas. LRQA could confirm that the investment analysis is presented in a transparent manner, to the extent that the reader can reproduce the results. All the input values considered for the investment analysis were prevailing at the time of investment decision and are in conformity with the relevant guidelines of CDM EB. Thus the assessment of input parameters was done in accordance with paragraph 110 & 111 of VVM.

The post tax project IRR thus calculated with the above mentioned input parameters worked out to be 9.01 % without considering the benefits from the CDM revenue, which is less than the benchmark of 14.34%.

Sensitivity analysis:
In order to check the robustness of additionality, the PP has presented the sensitivity of critical input values. The critical input values identified by the PP are initial investment,

[10] http://www.incometaxindia.gov.in/Acts/INCOME%20TAX%20ACT/80-ia.asp

[11] Section 80 IA – Reduction in respect of profits and gains from industrial undertaking or enterprises engaged in infrastructure development etc. under which a deduction of an amount equal to 100% of the profit and gain derived from such business is allowed for any ten consecutive years out of fifteen years beginning from the year in which the undertaking or enterprise generates power or commences transmission or distribution of power.

tariff rate, net electricity supply, and O&M cost. The PP has considered 10% variation in critical input values which is in accordance with the guidelines for the assessment of investment analysis.

The summary of sensitivity analysis is:

Parameter	10%	-10%	Cross Over point
Net electricity supply	11.03%	6.47%	30.13%
O&M	8.07%	9.37%	-134%
Tariff	11.03%	6.47%	30.13%
Initial Investment	7.48%	10.81%	-28.07%

Net electricity supply:
LRQA confirmed that the average PLF for Cumbum pass where the project is located is 30.44%, as confirmed from the TNERC order dated 20/03/2009. This compares with the PLF of 30.19% that is considered for the project activity investment decision. The highest PLF indicated as achievable for the wind projects located in Tamilnadu as per the TNERC tariff order dated 20/03/2009 is 32.31%. It is therefore unlikely that the plant load factor would be increased by 30.13% above the value considered for investment decision. Further, the PLF study report by the independent third party (AWST) suggests lower PLF and there is a 50% chance of a decrease in the actual PLF; therefore, increase in the PLF is not likely.

O&M cost: The Initial investment and the operation & maintenance contract have already been executed and there has been a decrease in O&M cost of 18.75% from the value considered for the investment analysis. However, this decrease in O&M costs does not approach the theoretical cross-over point for O&M, which can be calculated as -134%.

Tariff rate: The PP has already signed power purchase agreement with the TNEB at INR 3.39/KWh fixed tariff for 20 years. Therefore, the cross-over point, i.e. tariff increase by 30.13%, for electricity tariff rate can not be achieved.

Initial investment: The PP has already signed 'supply agreement' and 'erection & commissioning agreement' with Vestas. The committed amount is about 8.25% lower than that is considered in the investment decision as per the proposal by Vestas in their quotation dated 31/05/2010. Therefore, the cross-over point, i.e. decrease in initial investment by 28.07%, for initial investment can not be achieved.

LRQA confirmed that the result of the sensitivity analysis consistently supports that the project activity is not financially attractive.

Based on the validation of the investment analysis that included an assessment of all parameters and assumptions used in calculating the relevant financial indicator, cross-checks against third party or publicly available sources and correctness of calculations carried out, the financial returns of the proposed CDM project activity would be insufficient to justify the required investment.

LRQA has also checked for the materiality of all the variations in the input values. IRR has been recalculated considering actual investment cost, O&M cost and tariff as per PPA. As a result, the IRR improves to 11.89%. However, the revised figure of IRR considering the actual investments is still below the benchmark rate of return.

Prior serious consideration of CDM

The PDD indicates the start date of the project activity to be 30/06/2010, from the supply agreement. LRQA has validated the start date in accordance with Glossary of CDM terms version 05, through the review of supply agreement, E&C agreement, Service & availability agreement and power purchase agreement.

The date of publication of the PDD for stakeholders' comments is 03/09/2010 which is after the start date of the project activity. The start date of the project activity is after 2 August 2008, hence, the project is categorised as new project activity in accordance with "Guidelines on the demonstration and assessment of prior consideration of the CDM, Version 03" Annex 22 to the 49th meeting of CDM-EB. In accordance with paragraph 2 of the guidelines, the PP had informed the Host Party DNA and the UNFCCC Secretariat on 07/06/2010 of the commencement of the project activity and their intention to seek CDM status.

LRQA has reviewed the intimation letter along with the completed F-CDM-Prior consideration form submitted by the PP to UNFCCC and DNA of India. The validation team had confirmed the name of the project activity in the list of notifications received by the UNFCCC available from the UNFCCC website. Further, the board decision dated 02/06/2010 specifically stated the project viability with support from CDM revenues. Therefore, LRQA confirmed that benefits of CDM were decisive factor in the decision to proceed with the project.

CL 03

The PDD Version 01.2 states the comprehensive tariff order was issued by TNERC; however, the link provided in the PDD refers to the Gujarat Electricity Regulatory Commission. Therefore, **CL 03** was raised. In response to the finding, the PP has revised the link. The revised link is now correctly referring to the comprehensive tariff order issued by TNERC. Therefore, finding was closed. (ref Appendix F: Validation findings log of this report).

CL 04

Inconsistencies were found in the PDD/investment analysis as below:

1. Total project cost mentioned in the quotation and investment analysis was 6535.2 Million INR whereas the PDD Version 01.2 mentions 6536.2 Million INR
2. Details of land cost was not provided
3. The escalation in O&M cost mentioned in the quotation is 7.5% whereas 5% has been mentioned in the PDD.
4. Though from higher depreciation, the PP can save income tax in the initial years, PP was requested to justify how such tax savings has been considered for investment analysis for the project activity.
5. Though the financial spreadsheet calculates IRR as 6.47% in sensitivity over net generation reduced by 10%, PDD mentions the value as 4.56%.

In response to the finding, the following changes have been made to the investment analysis and the revised PDD:

1. The revised PDD correctly mentions the project cost as 6535.2 Million INR. The validation team has verified that this cost is consistent with that mentioned in the quotation. The project cost was also compared with similar registered projects at UNFCCC. Summary of this has been provided in the justification of project cost above.

2. The land cost has been revised to 0.176 Million INR per project in the financial spreadsheet and sourced from the actual land cost from previous wind project in Tamil Nadu (This project is also registered at UNFCCC Ref: 3327). This value is conservative and appropriate.
3. The revised PDD corrects the typographical error of escalation in O&M cost.
4. The revised financial spreadsheet correctly includes the income tax savings. The validation team confirms that income tax savings are correctly calculated and are in accordance with the host country rules. (Ref: Section 32 and Section 80IA of income tax act).
5. The revised PDD correctly reflects the values of sensitivity as calculated by the financial spreadsheet.

Therefore, finding was closed. (ref Appendix F: Validation findings log of this report).

4.4 Emission reductions

Emission reductions

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

$ER_y = BE_y - PE_y - LE_y$

BE_y: Baseline emissions in the year y (tCO_2e/y)
PE_y: Project emissions in the year y (tCO_2e/y)
$LE_{y:}$ Leakage emissions in the year y (tCO_2e/y)
$ER_{y:}$ Emission Reductions in the year y (tCO_2e/y)

Project emissions (PE_y)

As per the applicable methodology, the project emissions are applicable only for geothermal power plants or hydro power plant. Hence, the PP has not considered the project emissions and these are considered zero, $PE_y = 0$.

Leakage

The methodology requires leakage consideration if the energy generating equipment is transferred from another activity or if the existing equipment is transferred to another activity. The project activity uses new wind power generation equipment, which was confirmed based on the document review of the supply agreement between the PP and Vestas.

As no project emission (PE_y) or leakage emission (LE_y) is considered for the project activity, therefore the estimated baseline emission (BE_y) becomes the emission reduction (ER_y), i.e.;

$PE_y = 0$
$LE_y = 0$
Thus,
$ER_y = BE_y$

The baseline emission is calculated by the quantity of electricity exported to the regional grids by the project in year y and the CO_2 emission factor of the particular grid system.

Baseline emissions

According to the applied methodology AMS.I.D Version 16, the baseline emissions are

the product of electrical energy baseline or the electricity produced from the renewable generating units multiplied by the grid emission factor.

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 30/10/2009.

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 PP uses the EF for the grid electricity as calculated in CO_2 Baseline Database for the Indian Power Sector published by the Central Electricity Authority (CEA), Ministry of Power, Government of India. The CEA publishes on an annual basis the General Review and the Performance Review of Thermal Power Stations which is used by the majority of CDM project developers. 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 05 has been applied as it was current at the time of submission of the CDM-PDD for validation.

LRQA confirmed that the PP applied the calculations specified in the step-wise approach of *the tool* to the publicly available database and confirmed that the OM & BM reported in the database are correct.

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 Southern 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 an average over 5 years (2004-05: 21.6%, 2005-06: 27.0%, 2006-07: 28.3%, 2007-08: 27.1% and 2008-09: 22.8%) 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, is based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation. It was found to be 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 Southern Grid and arrived at the following summary:

Year	Absolute emissions (including imports) (tCO_2)	Net Generation (including imports) (GWh)	Specific emissions (tCO_2/GWh)	Specific emissions (tCO_2/MWh)
2008-09	124,337,059	127,797	972.92	0.97292
2007-08	113,626,240	114,702	990.62	0.99062
2006-07	109,020,456	109,116	999.12	0.99912

EF_{gridOM} = (0.92792×127,797+0.99062×114,702+0.99912×109,116)/(127,797+114,702+109,116) = 0.9868 tCO_2/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 CEA database provides a BM value for the Southern grid as 0.8179. As part of validation of Step 5 of the tool, LRQA confirmed through independent calculations the BM for the year 2008-09 as per the following summary:

Year	Absolute emissions tCO_2	Net Generation GWh	Specific emissions (tCO_2/MWh) BM
2008-09	25,851,336	31,606	0.8179

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

the following equation:

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

According to the guidance on selecting alternative weights in *the tool,* the default weights applicable for wind projects are $w_{OM} = 0.75$ and $w_{BM} = 0.25$ for the first and subsequent crediting period have been applied,

The baseline grid emission factor has been calculated as;
$EF_y = 0.9445\ tCO_2e/MWh$

The baseline emissions thus can be estimated as:
$BE_y = EG_y * EF_y$

The total installed capacity of the project activity is 9.9MW with estimated net annual generation of 24,138 MWh that will be delivered to Southern grid annually. Ex-ante electricity generation has been evaluated based on 'Tool for validation of plant load factor', Version 01 Annex 11 of CDM-EB meeting 48, through the study report from an independent third party i.e. AWS TruePower. It may be noted that ex-ante estimated electricity generation used for additionality is different from the value mentioned in the calculation of the ex-ante emission reduction. The additionality argument is based on the value mentioned in the quotation submitted by Vestas dated 31/05/2010, whereas the ex-ante emission reduction is based on PLF assessment study. The PLF assessment study concludes a lower value of PLF, giving a conservative estimate of ex-ante emission reduction.

The annual average baseline emission is estimated to be 24,138 MWh * 0.9445 $tCO_2e/MWh = 22,798\ tCO_2e$.

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

$ER_y = BE_y – PE_y – LE_y$
$ER_y = 22,798 – 0 – 0$

The average annual emission reduction is 22,798 tCO_2e per year over 7 year renewable 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 03
Though the source of data for net generation in build margin and share of low-cost/must-run power plant has been mentioned as CO_2 baseline database for Indian power sector, Version 05, the values presented in the Annex-3 of the PDD Version 01.2 are not matching with the CEA database. Therefore, **CAR 03** was raised. In response to the CAR, the PP has revised the net generation and share of low-cost/must-run power plants. The validation team has reviewed the values and determined that they are consistent with CO_2 baseline database for Indian power sector, Version 05. Therefore, the finding was closed. (ref Appendix F: Validation findings log of this report).

4.5 Monitoring methodology and monitoring plan

The project activity applies the monitoring methodology AMS.I.D Version 16 for monitoring of emission reduction which is the most recent version of the methodology available. 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 the grid emission factor. The determination of the grid EF is as described in the above section 4.4, and the ex-ante method has been selected by the PP. Therefore, the monitoring plan includes monitoring of electricity exported to the grid and electricity imported from the grid.

The net electricity generated is monitored as the net electricity supplied to the regional grid through the sub-station of TNEB. The net electricity exported by the WTG is the difference of electricity export and import as measured by tri-vector bi-directional meter of accuracy class 0.5.

During the site visit, it was confirmed that Trivector bidirectional energy meters of 0.5 class accuracy have been provided for measuring and monitoring the electricity exported and imported on a continuous basis for each of the WTGs. For billing TNEB, the meter readings will be taken every month by TNEB officials in presence of company representatives and readings will be jointly certified. This was confirmed through interview with the Additional Divisional Engineer/ Assistant Engineer of the sub-stations during the site visit.

The diagram presented in the section B.3 of the PDD further elaborates on the monitoring plan and provides that the meter readings attached to every WTG would be jointly read by TNEB officials and PP representative and certified. This satisfies the institutional arrangement with respect to data collection and archiving. Further, the PDD states that all the monitored data will be archived electronically for a period of 2 years after the crediting period.

The calibration of monitoring equipment will be done once in two year by TNEB as per the PPA and in compliance with the host country regulation[12]. The project proponents have contracted the technology suppliers for the operation and the maintenance of the WTGs. The O&M team at the site will be responsible for the maintenance and operation of the WTGs in accordance with the Quality Instructions and Operation and Maintenance Manuals of the technology supplier. On a daily basis, a production report will be generated detailing the daily and accumulated production for each WTG at

[12] http://www.cea.nic.in/e&c/regulations/notified_regulations/Metering_Regulations.pdf

controller, daily WTG and grid availability and details of stoppages. The process was confirmed during on-site visit at Vestas local office.

Vestas have quality management systems in place that account for the identification and conduct of training (class training as well as on-the-job training) to bridge the gaps with respect of competence.

The monitoring is considered to meet with the current good practice in the industry and it is judged that the use of monitoring methodology is appropriate. The operational and management structures that will be implemented in order to monitor ER have also been suitably addressed. The monitoring plan complies with the requirements of the methodology, monitoring arrangements described are feasible within the project design and LRQA confirms the ability of the PP to implement the monitoring plan.

CAR 04
The PDD Version 01.2 does not clearly describe the monitoring and measurement frequency. Further, the QA/QC procedures do not refer to the cross verification from invoices/receipts. Therefore, **CAR 04** was raised. In response to the finding, the PP has revised the monitoring plan. The revised monitoring plan includes continuous monitoring and measurement; and QA/QC procedures include cross verification from invoices. The validation team has confirmed that the electricity generation is monitored continuously through the local control room through a SCADA system. Further, the electricity measurement is done continuously through the tri-vector bi-directional meter installed by TNEB; this meter will also be used for invoicing and billing. Therefore, the validation team confirmed that the proposed changes in the monitoring plan are feasible. Therefore, the finding was closed. (ref Appendix F: Validation findings log of this report).

CL 05
The PDD does not clearly describe the monitoring procedure used when monitoring period falls in between the billing cycle. Therefore, **CL 05** was raised.
In response to the finding, the PP has revised the monitoring plan. The revised monitoring plan correctly mentions the reference of daily generation reports measured at the TNEB meter provided by the O&M team for monitoring periods that fall in between billing cycles. The validation team has confirmed that the daily generation reports of the TNEB meter are also taken by the O&M team. These reports correctly represent the net electricity supplied to the grid as required by the applied methodology. Therefore, the finding was closed. (ref Appendix F: Validation findings log of this report).

4.6 Duration of the project activity / crediting period

The PDD mentions the start date of the project activity as 30/06/2010 and the operational lifetime is expected to be 20 years. The start date of the project activity and serious consideration of CDM has already been discussed in section 4.2 above.

The starting date of crediting period is indicated in the revised PDD as being 01/05/2011. The crediting period may only start after the date of registration of the proposed project activity as a CDM project activity.

The PP has chosen a renewable crediting period for this project activity. The lifetime of the activity is 20 years hence, 7 years with an option of renewing can be considered acceptable.

4.7 Environmental impacts

LRQA, through a review of the most current Environmental clearance regulations, confirmed that there is no requirement to carry out any environmental impact assessment. However, the possible environmental impacts during construction and operation of the wind turbines are discussed appropriately in the PDD.

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). Hence, 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.
During the site visit, sporadic agricultural activities in the surrounding areas were observed around the land earmarked for the WTGs. However, the PDD Version 01.2 indicates that land used to set up the wind farm was barren. Therefore, **CL 06** was raised.
In response to the finding, the PP has presented the official government document stating that the land used for the WTGs are classified as non-agricultural barren land. Therefore, the finding was closed. (ref Appendix F: Validation findings log of this report).

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 to the comments received.

The project activity is to utilise wind energy for power generation. The PP invited the local stakeholders and sought their comments. Stakeholders included residents of neighbouring villages. Representatives from the technology supplier were as well present during the stakeholder consultation process. A review of the Stakeholder meeting minutes held on 09/07/2010 shows that people were supportive of the project activity and expressed no negative comments on the project activity.

During the site visit conducted in October 2010, LRQA met a selection of the stakeholders. The stakeholders were mainly farmers, and villagers, representatives of O&M service providers and officials from the state electricity board, i.e. TNEB. LRQA confirmed that land used for installation of WTG is non-agricultural land. The stakeholders confirmed their presence in the stakeholder meet held by the PP and that they had no concerns with respect of the project activity.

LRQA confirms 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.

PDD Version 01.2 does not clearly describe the process of inviting local stakeholder's comments and the timeframe given to the stakeholders for comments. Therefore **CL 07** was raised.

In response to the finding, the PP has included the selection procedure for sending the invitation letters, date and name of newspaper where public notice was issued, and timeframe given to the stakeholders. The validation team confirmed the date and name of newspaper from the actual newspaper presented and interview of stakeholders. The

validation team also confirmed the invitation letters were sent to most of the local villagers in the nearby area and that a sufficient timeframe was given. Therefore, the validation team confirmed that the process for invitation of comments was appropriate and the description given in the PDD is accurate. Therefore, the finding was closed. (ref Appendix F: Validation findings log of this report).

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 03 September 2010 to 02 October 2010 as per http://cdm.unfccc.int/Projects/Validation/DB/394W0HNHUAIJ9U963JVQV8WO1HEQVH/view.html.

Two comments were received during the period. The comments received have been taken into consideration as detailed in Appendix D of this report.

There were a number of changes from the PDD Version 1.2 posted for GSP and the revised PDD Version 3. The major points are:

- Changes in investment analysis by inclusion of notional cash flow from tax savings due to higher depreciation rates in response to CL 04
- Changes in the monitoring plan in closure of CAR 04 and CL 05

The changes above were to address the issues raised by the validation team in CARs/CLs and resulted in increase in IRR from 6.33% to 9.01%.

6 Validation Opinion

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

The project activity is the installation of a 9.9MW wind power project in the state of Tamil Nadu. The electricity generated from the project activity will be sold to the state electricity body, i.e. TNEB for grid electricity, thus displacing the electricity generated from the fossil fuel based power plants in Southern grid system.

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 PP, stakeholders and verified the evidence from alternate sources and an independent review. Through the process of validation the team has identified 4 CARs and 7 CLs. The PP has taken necessary actions and all CARs and CLs have been successfully closed. The overall conclusions for the project activity have been briefly summarised below:

- The PP has correctly applied AMS.I.D Version 16 to the project activity that involves electricity generation from wind turbines that supplies electricity to an electricity distribution system.
- The Southern regional grid is the appropriate project electricity system considered for this CDM project activity.
- A combined grid emission factor of 0.9445 tCO_2e/MWh has been validated based on the most recent CEA Database Version 05 available at the time of submission of the PDD. The data vintage selected to be ex-ante.
- The PP was aware of CDM prior to the project start, benefits of CDM were seriously considered at the time of the investment decision and the notification to UNFCCC has been provided.
- 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.
- The 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. Two comment received during the global stakeholder process has been successfully addressed.
- The project activity supports the sustainable development criteria of the host party as evidenced by the Letter of Approval from the Host country.

The validation team is of the opinion that the proposed project activity confirms 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 “Wind power project at Theni by Powerica Limited” to the CDM Executive Board as a CDM project activity.

Decision Maker



Andrew Ritchie

Climate Change Services Manager

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 Forests dated 15/11/2010, Ref: 4/14/2010-CCC

7.2 Appendix B: List of documents reviewed

Category A documents (documents prepared by the PP)

1. Project design document, Version 01.2 date 01/09/2010, Version 02 dated 18/11/2010, Version 03 dated: 01/03/2011
2. IRR and CER spreadsheet Version 01, and Version 02
3. Letter of Approval dated: 15/11/2010 Ref: 4/14/2010-CCC
4. Copy of extracts of Minutes of Board meeting held on 02/06/2010
5. Copy of "Powerica Limited Long-Term Wind Speed and Energy Production Estimates" prepared by AWS Truepower dated: 30/07/2010, technical report from independent third party
6. Copy of Budgetary offer/quotation from Vestas dated: 31/05/2010
7. Copy of supply agreement with Vestas dated: 30/06/2010
8. Copy of erection and commissioning contract with Vestas dated: 30/06/2010.
9. Copy of service availability agreement for WTGs dated: 30/06/2010
10. Copy of land sale deeds at Theni, dated: 05/08/2010, Ref: 1889, 4547, 4550, 4546, 4549, 4548
11. Type certificate issued by DNV for V82-1.65MW dated: 06th February 2008 and valid till 06th February 2013, Ref: IEC TC-212401-0
12. Approval for installation of WTGs issued by Tamil Nadu Electricity Board dated: 31/08/2010, Ref: 1558/D372, 1556/D374, 1550/D376, 1551/D384, 1557/D380, and 1548/D382,
13. Copy of newspaper advertisement in local newspaper "Dinathanthi"
14. Copy of invitation letter to the villagers
15. Minutes of meeting for local stakeholders' consultation held at Aarthi Mahall on 09/07/2010
16. Copy of mail intimating CDM EB about serious consideration of CDM in accordance with the tool dated: 07/06/2010
17. Directory Indian wind power – 2009
18. Copy of the technical description of Vestas V82 – 1.65MW WTG
19. Copy of the twenty third annual report of Powerica for the year 2006-07
20. Copy of the twenty fourth annual report of Powerica for the year 2007-08
21. Copy of the twenty fifth annual report of Powerica for the year 2008-09
22. Copies of the wind energy purchase agreements dated: 13/09/2010 & 17/09/2010
23. Copies of the WTG commissioning certificates
24. Copies of the Chief Electrical Inspector to Government installation approvals (type test certificates)
25. Screenshots of the beta values
26. Land sale deeds of previous wind power project at Tirunelveli, Tamil Nadu
27. Non-agricultural land clearance from revenue department.

Category B documents (other documents referenced)

1. Grid connected renewable electricity generation, Version 16.
2. Tool to calculate the emission factor for an electricity system" Version 02
3. CO_2 Baseline Database for the Indian Power Sector, User Guide Version 5.0
4. User guide version 05 CO_2 baseline database for Indian power sector.
5. Clean Development Mechanism Small Scale Project design document form (CDM-SSC - PDD)
6. Guidelines for completing the Simplified Project Design Document (CDM-SSC-PDD) and the Form for proposed new small scale methodologies (CDM-SSC-NM) Version 05
7. Guidelines on the Assessment of Investment Analysis (Annex 58 of CDM-EB meeting 51)
8. Guidelines on the Demonstration and Assessment of prior consideration of the CDM (Version 03)
9. Clean Development Mechanism Validation and Verification Manual (Annex 1 of CDM-EB meeting 55)
10. Eligibility Criteria for Host Country Approval, National CDM Authority, Ministry of Environment & Forests
11. Notification by Ministry of Environment & Forests dated 14th September 2006
12. Tariff order for Tamil Nadu
13. Press note on tariff order by Gujarat Electricity Regulatory Commission (http://www.gercin.org/docs/What's%20New%20in/Press%20Note%20on%20Wind/wind%20tariff%20press%20note%202010.pdf)
14. Press note on tariff order in Gujarat by Business standard (http://www.business-standard.com/india/storypage.php?autono=384188)
15. Gujarat state 'Wind Power policy – 2007', (http://www.geda.org.in/pdf/wind/wind_power_policy2007.pdf)
16. 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)
17. Manufacturers-wise wind electric generators installed in India (http://www.cwet.tn.nic.in/html/information_mw.html)
18. Tariff announced by State Electricity Regulatory commission in the respective states (http://www.cwet.tn.nic.in/Docu/Tarrif-SERC.pdf)
16. Wind power density map (http://www.cwet.tn.nic.in/Docu/WPDmap.pdf)
17. Bombay stock Exchange http://www.bseindia.com

7.3 Appendix C: List of persons interviewed

Name	Organization
Mr. Rajat Oberoi	Powerica Ltd.
Mr. Pradeep Gupta	Powerica Ltd.
Mr. Deepak Thakore	Powerica Ltd.
Mr. N K Moorthy	Powerica Ltd.
Mr. R Manikandan	Powerica Ltd.
Ms. Nargis Ali	Powerica Ltd.
Ms. Kety Mistry	Powerica Ltd.
Mr. V. Sarvanakumar	TNEB

Name	Organization
Mr. B Ramaswamy Pillai	Vestas
Mr. Ramesh babu	Local villager
Mr. M. Balachandran	Local villager
Ms. Jayalalitha	Local villager

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 03 September 2010 to 02 October 2010 as per http://cdm.unfccc.int/Projects/Validation/DB/394W0HNHUAIJ9U963JVQV8WO1HEQVH/view.html.

Two comments were received during the period and the comments were made publicly available as per http://cdm.unfccc.int/Projects/Validation/DB/394W0HNHUAIJ9U963JVQV8WO1HEQVH/view.html.

Comments received have been taken into consideration as follows:

Date of comment	Comment
Comment 01; dated 03 September 2010	It is now unfortunate part of LRQA to web host such a PDD where a common lay man can understand the flaws in the PDD. At least LRQA could have checked the recent EB review questions. Consider the following comments: 1. Even with CDM revenues also, Equity IRR can not cross bench mark and does not alleviate. It is not meant to improve the returns. 2. secondly, can any Indian investor invests considering the returns of 6.33%? which means PP can not be in profits for 3/4th of lifetime of the project. 3. Please at least look at the project cost provided in recent publications and CERC, TNERC approved tariff orders. With this project cost any project would become additional. 4. Where is the PLF, intentionally not mentioned the Key assumption to mislead the stake holder.
Response from PP	1. The investment analysis spreadsheet was revised to include savings in income tax as cash inflow, the IRR is revised to 9.01% and with the CDM revenues IRR is 11.77%. The revenues from CERs have been computed based on evidence available at the time of investment decision. Though it will be difficult to present necessary evidence on increasing trend of CER prices, however, we are optimistic that it will be high enough that the project will be able to reach the benchmark.

	2. The revised investment analysis presents IRR as 9.01% and according to this the project is in profit from 9th year onwards. This return is still lower as compared to the expected return for an Indian investor. We expect CER prices to improve, thereby, improving the returns more than the expected returns. 3. The project costs mentioned in CERC and TNERC tariff orders are only indicative figures. The project costs for this project is inline recent registered projects in wind from India. Further, the actual contracted cost for the project activity as mentioned in the supply agreement, and E&C agreement is actually 600.5 Million INR which is close (about 9.01% lower) to that mentioned in the quotation submitted by Vestas. 4. Though the PLF has not been mentioned in the web-hosted PDD, however, net generation and installed capacity of the project was mentioned (Ref: page 13/33 section B.5 of the PDD, Version 03). The PLF can be calculated as: PLF = (Net generation)/(365*24*Installed capacity) PLF for this project can be calculated as 30.19%.This higher PLF has been used for additionality determination.
Evaluation of such response by LRQA	The validation of the project has been done after the web-hosting of the PDD for Global Stakeholders' Consultation. This is in accordance with the 'Procedures for processing and reporting on Validation of CDM project activities', Version 03 (Annex 48 of the 50th meeting of CDM-EB). The validation team confirms that Guidance provided by the EB through Validation and Verification Manual and recent decision have been considered for giving the final Validation opinion. Following is the evaluation of the validation on the other comments provided by the author: 1. Though the equity IRR does not cross the benchmark even after considering the CDM revenues. The investment in the project has been undertaken by the PP based on their understanding of expected CER prices that would alleviate the project returns and therefore justification provided by the PP is considered reasonable to accept. The PP also has invested in similar projects recently (PA 3327 & 3632) with the expectation that the CER income would alleviate the returns of the project. 2. The expected return for an Indian investor has been estimated through CAPM model in the PDD and investment analysis spreadsheet. This has been calculated as the expected rate of return in the stock market, risk free rate of return, and risk profile (Beta) of similar companies. The expected return for an Indian investor has been estimated to be 14.34%. The validation of expected rate of return has been described in page 15 of this validation report. The PP has revised the investment analysis including savings in income tax as cash inflow in response to CL-

	04. The validation team confirmed that the calculation has been correctly done. Further, the revised investment analysis improves the IRR to 9.01% and the project is in profit from 9th year. 3. The project cost mentioned in the tariff orders is only indicative. The project used for investment analysis has been compared with similar registered projects where the cost varies from INR 60.6-81 Millions/MW. The detailed validation of the project cost has been described in page 19 of this validation report. 4. Section B.5 of the web-hosted PDD mentions Net generation and total capacity of the project. PLF can be derived from that data as: PLF = (Net generation)/(365*24*Installed capacity) PLF for this project can be calculated as 30.19%. The validation team has verified the PLF with the quotation provided by Vestas, report from PLF study report prepared by AWS Truepower. PLF has also been compared from the TNERC tariff order and similar registered projects at UNFCCC. The detail validation of the net electricity generation from the project is provided in this report page 18.

Comment – 02, dated: 21 September 2010	It is a well known fact that the wind projects are mainly installed considering CDM revenues and offsetting of tax liability of the company as a result of accelerated depreciation of 80%. PPs cleverly do not consider the accounting tax offsetting in their companies while calculating the IRR. This is evident from the recently registered projects and those requesting registration. It is seen from the projects in pipeline that wind projects do not present the actual financials while proving additionality and hence abusing the Clean Development Mechanism. The DOE is therefore requested to critically analyse how the accelerated depreciation benefit has been taken into account and confirm the accounting of the cash inflows as a result of the negative tax liability in the initial years. DOE should not be misguided by the financial presented by the PP or consultant which are custom made for CDM purposes and not the actual financial considered at the investment decision. Note that considering cash inflows results in an increase in the IRR making wind projects a profitable venture.
Response from PP	Revised investment analysis spreadsheets include notional cash flow from income tax savings.
Evaluation of such response by LRQA	The validation team has confirmed that the project has taken the benefits of accelerated depreciation [13] in its application dated 10/11/2010 to

[13] http://www.ireda.gov.in/pdf/AD%20Projects.pdf (Serial No. 223)

	Indian Renewable Energy Development Agency (IREDA) Limited. During validation, LRQA has raised a Clarification request (please refer CL04) to this effect and the validated investment analysis has taken account of the cash inflow from tax savings from other businesses of the PP. LRQA has confirmed that the income tax savings due to accelerated depreciation has been correctly calculated and included as cash inflow for this project. Therefore the post tax IRR is improved to 9.01% without CDM benefits. Please refer to the validation of the investment analysis in this report page numbers 14 to 24.

7.5 Appendix E: Certificate of Appointment

Validation of "Wind power project at Theni by Powerica Limited"

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

Name of Person	Assigned Roles
Ankush Jain	Team Leader
Ponnada Rama N Rao	Team Member
Dave Mateo	Team Member
Imran Ustad	Technical Reviewer – Trainee
Prabodha Acharya	Technical Reviewer
Andrew Ritchie	Decision Maker

Signed by



Andrew Ritchie

Decision Maker

7.6 Appendix F: Validation findings log

1. Grade / Reference:	CAR 01	**2. Date:**	26/10/2010	**3. Status:**	Closed
4. Requirement	Para 44 of CDM-VVM, Version 01.2;				
5. Finding: LoA by the DNA of the host country for the project has not been made available for validation.					
6. Conclusion: PP has presented LoA of the host party to the validation team. The title of the project and the name of the PP mentioned in the LoA matches exactly with that in the PDD. LoA meets the requirement of written approval, stating that the party is the party to the Kyoto Protocol, voluntary participation, and confirmation on contribution of the project towards sustainable development. Therefore, the finding has been closed.					

1. Grade / Reference:	CAR 02	**2. Date:**	26/10/2010	**3. Status:**	Closed
4. Requirement	Para 81 of CDM-VVM, Version 01.2; Guidelines for completing CDM-SSC-PDD, Version 05				
5. Finding: Though the Guidelines for completing CDM-SSC-PDD Version 05 require section B.4 of the PDD to specify the baseline scenario, section B.4 of the PDD Version 01.2 only states baseline emissions and does not describe the baseline scenario.					
6. Conclusion: In response to the finding, the PP has revised the PDD and now correctly refers to the baseline scenario. The validation team has reviewed the PDD and found the description of the baseline scenario is in accordance with the paragraph 10 of the approved small-scale methodology, AMS.I.D, Version 16. Therefore, the finding has been closed.					

1. Grade / Reference:	CAR 03	**2. Date:**	26/10/2010	**3. Status:**	Closed
4. Requirement	Para 89 of CDM-VVM Version 01.2				
5. Finding: The following inconsistencies were found in the Annex 3 of the PDD (baseline information): 1. Net generation in build margin for the year 2006-07, 2007-08 and 2008-09 are 30,442GWh; 31,613 GWh; and 31,606 GWh as mentioned in CO_2 baseline database, Version 05 whereas PDD Version 01.2 states 30,441 GWh; 31,463 GWh; and 31,467 GWh respectively. 2. Share of low-cost/must-run power plant in the year 2004-05 is 21.6% whereas the PDD Version 01.2 states 16.8%.					
6. Conclusion: In response to the finding, the PP has corrected the figures of net generation in BM and share of low-cost/must-run power plants. The validation team has reviewed the revised PDD and now the figure of Net generation in build margin, and share of low-cost/must-run power plants are consistent with CO_2 baseline database for Indian Power sector, Version 05. Therefore, the finding was closed.					

1. Grade / Reference:	CAR 04	**2. Date:**	26/10/2010	**3. Status:**	Closed
4. Requirement	Para 123 (a) of CDM-VVM Version 01.2				
5. Finding: The applied methodology (AMS.I.D Version 16) requires continuous monitoring, hourly measurement and at least monthly recording for the parameter EGy (net electricity exported to the grid). However, PDD Version 01.2 does not mention monitoring and measurement frequency. The applied methodology also requires that the parameter EGy be cross verified from invoices/receipts, the PDD version 01.2 does not specify how the requirement is fulfilled in the monitoring plan.					
6. Conclusion: In response to the finding, the PP has revised the monitoring plan in the PDD, Version 03. The revised monitoring plan correctly includes continuous monitoring and measurement and at least monthly recording for the parameter net electricity supplied to the grid, which is now in accordance with the methodology AMS.I.D, Version 16. The QA/QC procedures have been revised to include cross verification of the monitored data from invoices/receipts in accordance with the applied methodology. Therefore, the finding was closed.					

1. Grade / Reference:	CL 01	**2. Date:**	26/10/2010	**3. Status:**	Closed
4. Requirement	Para 55 of CDM-VVM, Version 01.2; and Guidelines for completing CDM-SSC-PDD, Version 05				
5. Finding: During the site visit it was noted that information board on each of the wind turbine displays SF, GEN SL, TR SL, and HTSC numbers. However, the PDD version 01.2 refers Turbine IDs as unique identification number as per the Supply Agreement. The PP is requested to clarify whether the remaining other numbers (i.e. SF, GEN SL, HTSC numbers) associated with the wind turbine can also be considered as unique identification and in such case please clarify why this information would not be included in the PDD.					
6. Conclusion: In response to the finding, the PP has included the HTSC number as unique identification of the project activity. The validation team has reviewed the PPA, and commissioning certificate to confirm the HTSC number presented in the PDD are correct. Therefore, the finding was closed.					

1. Grade / Reference:	CL 02	**2. Date:**	26/10/2010	**3. Status:**	Closed
4. Requirement	Para 58 of CDM-VVM, Version 01.2; and Guidelines for completing CDM-SSC-PDD, Version 05				
5. Finding: Though the quotation provided by Vestas dated 31/05/2010 mentions nominal/rated wind speed as 13m/s, section A.4.2. of the PDD version 01.2 states it to be 14.4 m/s. PP is requested to clarify this inconsistency.					
6. Conclusion: In response to the finding, the PP has corrected the PDD and now consistently refers to the rated wind speed as 13m/s. The validation team checked that the rated wind speed is correct and consistent with the quotation and technical specification of the WTGs. The validation team has also confirmed the rated wind speed from the interview of site official of Vestas. Therefore, the finding was closed.					

1. Grade / Reference:	CL 03	2. Date:	26/10/2010	3. Status:	Closed
4. Requirement	Para 87 (d) of CDM-VVM, Version 01.2				

5. Finding:

In section B.5 of the PDD version 01.2, it has been stated that Tamil Nadu Electricity Regulatory Commission (TNERC) has issued a comprehensive tariff order, but the link presented in the PDD refers to Gujarat Electricity Regulatory Commission (GERC) tariff order. The PP is requested to clarify this inconsistency.

6. Conclusion:

In response to the finding, the PP has corrected the reference of TNERC tariff order. The validation team has checked the web-link correctly referring to the TNERC tariff order applicable for this project activity. Therefore, the finding was closed.

1. Grade / Reference:	CL 04	2. Date:	26/10/2010	3. Status:	Closed
4. Requirement	Para 110 of CDM-VVM & Guidelines on the assessment of investment analysis, Version 03.1				

5. Finding:

The PP is requested to clarify these inconsistencies in the PDD/investment analysis:

1. Though the project cost mentioned in the quotation provided by the Vestas dated 31/05/2010 and the investment analysis spreadsheet is 6535.2 Million INR, the PDD mentions 6536.2 Million INR. The PP is requested to clarify this inconsistency.
2. Though the documented land cost for the project is INR 528,190 as verified from land sale deeds, The PP is requested to justify how land cost of 2% of the project cost is appropriate which amounts to about INR 2.178 Millions.
3. Though the quotation provided by Vestas dated 31/05/2010 states annual escalation of 7.5% in O&M cost from the 3rd year onwards, and the same has been used in the investment analysis spreadsheet, section B.5 of the PDD version 01.2 mentions 5% annual escalation applicable from 4th year.
4. As the PP can save tax arising from other income of the PP due to accelerated depreciation rate of the wind turbine generator, the PP is requested to justify why savings in tax are not considered as income for this project activity for the corresponding years.
5. The investment analysis spreadsheet presents IRR of 4.96% when net generation is reduced by 10%, whereas section B.5 of the PDD version 01.2 presents 4.56% for same variation. PP is requested to clarify this inconsistency.

6. Conclusion:

In response to the finding, the following changes/justification were made by the PP:

1. Project cost has been corrected in the section B.5 of the PDD to 6535.2 Million INR. This value is now consistent with the project cost mentioned in the quotation provided by Vestas and the investment analysis. The validation team has cross checked the investment costs with the publicly available information and similar project activity and confirm the cost to be reasonable.
2. Land cost has been revised in the investment analysis. The revised land cost is taken from the previous investment made by the PP in their earlier project at Veeranam and registered at UNFCCC (Ref: 3327). Validation team has reviewed the land cost from the actual land sale deeds. Lower value of land cost used in the revised financials gives conservative estimate of additionality owing to higher tax savings from unabsorbed depreciation.
3. The PDD has been revised correctly referring to free O&M for first year. The validation team has confirmed the free O&M for first year from the quotation dated: 31/05/2010 submitted by Vestas.
4. The PP has revised the investment analysis including the tax savings from other businesses. The validation team has reviewed the changes in the revised spreadsheet and found that tax savings has been correctly applied in accordance with the host country rules.
5. Since, the IRR has been revised, the correct values for sensitivity variations has been presented in the revised PDD.

1. Grade / Reference:	CL 05	**2. Date:**	26/10/2010	**3. Status:**	Closed
4. Requirement	Para 123 (a) of CDM-VVM, Version 01.2				
5. Finding: The monitoring plan in the PDD version 01.2 describes, for the case when the monitoring period falls in between the billing cycles, the emission reductions will be claimed based on the daily generation report provided by the O&M service provider. Further, section B.7.2 of the PDD Version 01.2 mentions that O&M service provider monitors generation at two points, i.e. LCS meter, and TNEB owned meter. The PP is requested to clearly describe which daily generation report will be referred for emission reduction calculation.					
6. Conclusion: In response to the finding, the PP has revised the monitoring plan including the procedure for monitoring in between the billing cycle. The amended procedure refers to the daily generation records of the TNEB meter as taken by the O&M team. The validation team has confirmed that the daily electricity generation records measured at TNEB meters were taken by the O&M team and recorded. Therefore, the finding was closed.					

1. Grade / Reference:	CL 06	**2. Date:**	26/10/2010	**3. Status:**	Closed
4. Requirement	Para 129 of CDM-VVM				
5. Finding: Section D.1 of the PDD version 01.2 states that due consideration has been taken in order to ensure that the land available for the setting up of the wind farm has no alternative use, and that the land used for the purpose of setting up the wind farm was a barren land (i.e., uncultivated / non-productive), and the only vegetation in the vicinity was shrubs and weeds. However, during the site visit, sporadic agricultural activities were observed surrounding the WTG locations. The PP is requested to justify the land use pattern and classification for the land used for all the WTGs. PP is also requested to provide a copy of all the necessary clearances/NOCs taken for this project activity.					
6. Conclusion: In response to the finding, the PP has presented the land certificates issued by the local land revenue department. The certificates provided by the PP are duly signed and stamped and mention land of non-agricultural type. Therefore, LRQA confirmed that the land used for the project is non-arable type. The PP has further presented commissioning and CEIG certificate. Therefore, the finding has been closed.					

1. Grade / Reference:	CL 07	**2. Date:**	26/10/2010	**3. Status:**	Closed
4. Requirement	Para 129 of CDM-VVM				
5. Finding: Section E.1 of the PDD does not provide details on how local stakeholders' comments has been invited and compiled in a transparent manner for the consultation meeting that includes the following: 1. The timeframe, if given, to the stakeholder for receiving comments and the process of how stakeholders can provide comments; 2. Description of how the stakeholders were chosen; 3. Date and name of the newspaper where intimation (advertisement) was made for local stakeholders'; 4. Date when the invitation letters were sent; The list of household names / targeted stakeholders to whom 150 invitations were sent are not provided.					
6. Conclusion:					

In response to the finding, the PP has revised the section E.1 of the PDD including a detailed description of the process undertaken for the invitation of the comments from stakeholders. The revised description now includes the process of identifying local stakeholders, the date when invitation letter were sent to local stakeholders, the name of the local newspaper, the date of advertisement publication, and the timeframe given to the stakeholder for responding. The PP has further added the list of the stakeholders to whom invitation letters were sent in Appendix 1 of the revised PDD. The validation team confirmed the date and name of newspaper from the actual newspaper presented and interview of stakeholders. The validation team also confirmed the invitation letters was sent to most of the local villagers in nearby area and that a sufficient timeframe was given. Therefore, the validation team confirmed that the process for invitation of comments was appropriate and the description given in the PDD is accurate. Therefore, the finding was closed.