



VALIDATION REPORT

“14.1 MW GRID CONNECTED WIND
ENERGY PROJECT IN TAMILNADU BY ITC
LIMITED ”
IN
INDIA

REPORT No. 2008-1060

REVISION No. 01



VALIDATION REPORT

DET NORSKE VERITAS
CERTIFICATION AS

Veritasveien 1,
1322 HØVIK, Norway
Tel: +47 67 57 99 00
Fax: +47 67 57 99 11
http://www.dnv.com
Org. No: NO 945 748 931 MVA

| | |
|-------------------------------------|---|
| Date of first issue: 18 May 2009 | Project No.: PRJC-143154-2009-CCS-IND |
| Approved by: C Kumaraswamy | Organisational unit: Climate Change Services |
| Client: ITC Limited. | Client ref.: B. K. Pramanick |

Project Name: 14.1 MW grid connected wind energy project in Tamilnadu by ITC Limited
Country: India
Methodology: AMS-I.D
Version: 13
GHG reducing Measure/Technology: Renewable energy generation from wind
ER estimate: 253 276 t CO₂ over the seven year crediting period

Size

- Large Scale
 Small Scale

Validation Phases:

- Desk Review
 Follow up interviews
 Resolution of outstanding issues

Validation Status

- Corrective Actions Requested
 Clarifications Requested
 Full Approval and submission for registration
 Rejected

In summary, it is DNV's opinion that the "14.1 MW grid connected wind energy project in Tamilnadu by ITC Limited India", as described in the PDD of version 03 dated 6 July 2009, meets all relevant UNFCCC requirements for the CDM and correctly applies the simplified baseline and monitoring methodology AMS-I.D (version 13). Hence, DNV requests the registration of the "14.1 MW grid connected wind energy project in Tamilnadu by ITC Limited as a CDM project activity,

| | | |
|--|--|----------------|
| Report No.: 2008-1060 | Date of this revision: 30 September 2009 | Rev. No. 01 |
| Report title: "14.1 MW grid connected wind energy project in Tamilnadu by ITC Limited" in India | | |
| Work carried out by: G.Murali, S.Ranganathan | | |
| Work verified by: Ramesh Ramachnadran | | |

Key words:

Climate Change
 Kyoto Protocol
 Validation
 Clean Development Mechanism

- No distribution without permission from the Client or responsible organisational unit
 Limited distribution
 Unrestricted distribution



VALIDATION REPORT

Abbreviations

| | |
|------------------|---|
| CAR | Corrective Action Request |
| CDM | Clean Development Mechanism |
| CEA | Central Electrical Authority |
| CEF | Carbon Emission Factor |
| CER | Certified Emission Reduction |
| CL | Clarification request |
| CO ₂ | Carbon dioxide |
| CO _{2e} | Carbon dioxide equivalent |
| DNV | Det Norske Veritas |
| DNA | Designated National Authority |
| EIA | Environment Impact Assessment |
| GHG | GHG Greenhouse gas(es) |
| GWP | Global Warming Potential |
| IPCC | Intergovernmental Panel on Climate Change |
| LoA | Letter of Approval |
| MoEF | Ministry of Environment and Forests |
| MW | Mega Watt |
| MP | Monitoring Plan |
| MIS | Management Information Systems |
| MNES | Ministry of Non-conventional Energy Sources |
| NGO | Non-governmental Organisation |
| ODA | Official Development Assistance |
| O&M | Operations and Maintenance |
| PDD | Project Design Document |
| PLF | Plant Load Factor |
| TEDA | Tamilnadu Energy Development Agency |
| TNEB | Tamilnadu Electricity Board |
| TNERC | Tamilnadu Electricity Regulatory commission |
| UNFCCC | United Nations Framework Convention on Climate Change |
| WEG | Wind Energy Generators |



VALIDATION REPORT

TABLE OF CONTENTS

| | | |
|-----|--|----|
| 1 | EXECUTIVE SUMMARY – VALIDATION OPINION | 1 |
| 2 | INTRODUCTION | 2 |
| 2.1 | Objective | 2 |
| 2.2 | Scope | 2 |
| 3 | METHODOLOGY | 3 |
| 3.1 | Follow-up Interviews with Project Stakeholders | 4 |
| 3.2 | Resolution of Outstanding Issues | 5 |
| 3.3 | Internal Quality Control | 7 |
| 3.4 | Validation Team | 7 |
| 4 | VALIDATION FINDINGS | 8 |
| 4.1 | Participation Requirements | 8 |
| 4.2 | Project Design | 8 |
| 4.3 | Baseline Determination | 9 |
| 4.4 | Additionality | 10 |
| 4.5 | Monitoring | 13 |
| 4.6 | Estimate of GHG Emissions | 13 |
| 4.7 | Environmental Impacts | 14 |
| 4.8 | Comments by Local Stakeholders | 14 |
| 4.9 | Comments by Parties, Stakeholders and NGOs | 14 |

APPENDIX A: VALIDATION PROTOCOL

Appendix B: Certificates of Competence



VALIDATION REPORT

1 EXECUTIVE SUMMARY – VALIDATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a validation of the “14.1 MW grid connected wind energy project in Tamilnadu by ITC Limited ”, on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board.

The review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.

The project participants are ITC Limited from the host Party India. Host Party India fulfils all the participation criteria and has approved the project and authorized the project participant. Approval of voluntary participation by the Designated National Authority (DNA) of India and confirmation that the project assists in achieving sustainable development has also been obtained.

The project correctly applies the simplified baseline and monitoring methodology, AMS-I.D “Grid connected renewable electricity generation”, version 13. The project involves generation of renewable energy by installing wind energy generators (WEGs), which will partly displace the electricity generation in the fossil fuel dominated southern regional grid of India, thereby resulting in the reduction of GHG emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The project is estimated to result in emission reductions of 36 182 t CO₂ per annum over the selected 7 year renewable crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

The monitoring plan makes sufficient provision for monitoring relevant project and baseline emission indicators. Detailed responsibilities and authorities for project management, monitoring and reporting and QA/QC procedures have also been addressed.

In summary, it is DNV’s opinion that the “14.1 MW grid connected wind energy project in Tamilnadu by ITC Limited ” as described in the revised and resubmitted project design documentation, version 03, dated 6 July 2009.

, meets all relevant UNFCCC requirements for the CDM and correctly applies the approved small scale methodology AMS-I.D, version 13. DNV thus requests the registration of the “14.1 MW grid connected wind energy project in Tamilnadu by ITC Limited ” as a CDM project activity.



VALIDATION REPORT

2 INTRODUCTION

ITC Limited has commissioned Det Norske Veritas Certification AS to perform a validation of the “14.1 MW grid connected wind energy project in Tamilnadu” (hereafter called “the project”) in India. This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, the simplified modalities and procedures for small-scale CDM project activities and the subsequent decisions by the CDM Executive Board.

2.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project’s baseline, monitoring plan, and the project’s compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, the simplified modalities and procedures for small-scale CDM project activities and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology AMS-I.D. The validation team has, based on the recommendations in the Validation and Verification Manual /4/.

The validation is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.



VALIDATION REPORT

3 METHODOLOGY

The validation consisted of the following three phases:

- I a desk review of the project design documents
- II follow-up interviews with project stakeholders
- III the resolution of outstanding issues and the issuance of the final validation report and opinion.

The following sections outline each step in more detail.

I. Desk Review of the Project Design Documentation/

The following table lists the documentation that was reviewed during the validation:

- /1/ ITC : CDM –SSC-PDD for “ 14.1 MW grid connected wind energy project in Tamilnadu by ITC Limited ,Tamil Nadu State, India” PDD version 01 of 23 March 2009. Version 3.0 dated 6 July 2009
- /2/ Purchase order on Suzlon Energy dated 10 July 2008 for supply of 5 numbers of WEG
- /3/ CDM Executive Board, AMS-I.D, version 13 - Grid connected renewable electricity generation, version 13
- /4/ CDM Validation and Verification Manual, EB 44 (Version 01)
- /5/ Baseline carbon dioxide emissions from power sector, CDM- CO₂ – baseline database. <http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm>.
- /6/ Project proposal to CMC dated 6 March 2008 and approval note dated 29 April 2008
- /7/ Stake holder meeting notice 15 October 2008
- /8/ Wind mill commissioning certificates 20 September 2008 and 30 September 2008
- /9/ Electrical Inspectorate approval dated 19 September 2008
- /10/ Energy wheeling agreement with TNEB dated 20 September 2008
- /11/ Operation & Management Agreement (Services Only) and maintenance agreement dated 22 July 2008 with WEG supplier Suzlon and with Vestas dated 28 July 2008
- /12/ LoA from DNA of India, dated 29 June 2009
- /13/ Purchase order on Vestas dated 23 July 2008 for supply of 4 numbers of WEG
- /14/ Environmental Impact Assessment notification dated 14 September 2006 <http://envfor.nic.in/legis/eia/eia-2006.htm>
- /15/ No objection certificate dated 8 September 2008 from TNEB
- /16/ Electrical Inspectorate approval dated 19 September 2008 for generation.
- /17/ Stake holder meeting minutes dated 24 October 2008
- /18/ Contract with DOE dated 15 November 2008
- /19/ Submission of documents for DNA approval dated 5 march 2009
- /20/ Electricity bills of Tiruvottiyur Unit of ITC for the period April 2008 to September 2008
- /21/ TNERC order dated 15 May 2006 and amendment order dated 18 May 2006 on tariff and PLF basis
- /22/ <http://www.bseindia.com/about/abindices/bse30.asp> - list of companies taken for computing the beta value, Bombay Stock Exchange



VALIDATION REPORT

/23/ Certification by chartered accountant of the project financial workings dated 24 August 2009

The main changes between the PDD published for 30 day stakeholder commenting period and the final version submitted for registration are:

- 1) Updated to use the latest “*Tool for the demonstration and assessment of additionality*” of version 5.2;
- 2) Revision of the benchmark and confirmation of the details on the investment analysis as per the “Guidance on the Assessment of Investment Analysis”, Annex 45 of EB 41.
- 3) Revised sensitivity analysis for project cost and O&M cost.
- 4) Changes related to the CAR’s and CL’s identified in the DNV’s draft validation report.

3.1 Follow-up Interviews with Project Stakeholders

DNV performed a site visit during 28 April 2009 and 29 April 2009 to confirm the information provided in the PDD and to resolve issues identified in the document review. The site visit included discussions and perusal of documents at ITC’s office at Chennai and visit to the wind farms covered under the project activity located at Theni, Andipatti and Radhapuram taluks. Mr.G.Murali and Mr.S.Ranganathan of DNV carried out the site visit and interviewed the representatives of ITC Limited and Pricewaterhouse Coopers. The main topics of the interviews are summarized in Table 1.

| | Date | Name | Organization | Topic |
|----|-------------|-----------------------------------|-------------------------|---|
| 23 | 2009-04-28 | Mr.R Srinivasan | ITC Limited | <ul style="list-style-type: none"> ➤ Project baseline ➤ Project additionality and barriers ➤ CDM consideration at project approval stage and the benefit from CDM revenue. ➤ Validation of emission reduction calculations and data used therein. ➤ Monitoring and verification procedure and management structure of the organisation for the project activity. ➤ Review of the stakeholder consultation process. ➤ MOEF Approval |
| | 2009-04-29 | Ms.Radha | | |
| | | Vijayaraghavan Ms.Archana Ravi | | |
| | | Mr.Sharique Ahmad | Pricewaterhouse Coopers | <ul style="list-style-type: none"> ➤ Baseline determination ➤ Emission reductions calculation ➤ Emission reduction monitoring plan |



VALIDATION REPORT

3.2 Resolution of Outstanding Issues

The objective of this phase of the validation is to resolve any outstanding issues which need be clarified prior to DNV's positive conclusion on the project design. In order to ensure transparency a validation protocol was customised for the project. The protocol shows in a transparent manner the criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of three tables. The different columns in these tables are described in the figure below. The completed validation protocol for the "14.1 MW grid connected wind energy project in Tamilnadu by ITC Limited " is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of CDM criteria or where a risk to the fulfilment of project objectives is identified. Corrective action requests (CAR) are issued, where:

- i) mistakes have been made with a direct influence on project results;
- ii) CDM and/or methodology specific requirements have not been met; or
- iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

A request for clarification (CL) may be used where additional information is needed to fully clarify an issue.



VALIDATION REPORT

| Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities | | |
|---|--|--|
| Requirement | Reference | Conclusion |
| <i>The requirements the project must meet.</i> | <i>Gives reference to the legislation or agreement where the requirement is found.</i> | This is acceptable based on evidence provided (OK), a Corrective Action Request (CAR) of risk or non-compliance with stated requirements or a request for Clarification (CL) where further clarifications are needed. |

| Validation Protocol Table 2: Requirement checklist | | | | |
|--|--|---|---|--|
| Checklist Question | Reference | Means of verification (MoV) | Comment | Draft and/or Final Conclusion |
| <i>The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the large-scale PDD template, version 03 - in effect as of: 28 July 2006. Each section is then further sub-divided.</i> | <i>Gives reference to documents where the answer to the checklist question or item is found.</i> | <i>Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.</i> | <i>The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.</i> | <i>This is either acceptable based on evidence provided (OK), or a corrective action request (CAR) due to non-compliance with the checklist question (See below). A request for clarification (CL) is used when the validation team has identified a need for further clarification.</i> |

| Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests | | | |
|---|--|---|---|
| Draft report clarifications and corrective action requests | Ref. to checklist question in table 2 | Summary of project owner response | Validation conclusion |
| <i>If the conclusions from the draft Validation are either a CAR or a CL, these should be listed in this section.</i> | <i>Reference to the checklist question number in Table 2 where the CAR or CL is explained.</i> | <i>The responses given by the project participants during the communications with the validation team should be summarised in this section.</i> | <i>This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".</i> |

Figure 1 -Validation protocol tables



VALIDATION REPORT

3.3 Internal Quality Control

The validation report underwent a technical review before requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

3.4 Validation Team

The validation team consisted of the following personnel:

| <i>Role/Qualification</i> | <i>Last Name</i> | <i>First Name</i> | <i>Country</i> | Desk review | Site visit / Interviews | Reporting | Supervision of work | Technical review |
|---|------------------|-------------------|----------------|-------------|-------------------------|-----------|---------------------|------------------|
| CDM validator / Technical team leader | Govidarajulu | Murali | India | | Y | Y | Y | |
| GHG auditor | Seshan | Ranganathan | India | Y | Y | Y | | |
| Technical reviewer | Ramesh | Ramachandran | India | | | | | Y |

The qualification of each individual validation team member is detailed in Appendix B to this report.



VALIDATION REPORT

4 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation, version 03, dated 6 July 2009.

4.1 Participation Requirements

The project participant is ITC Limited. No Annex-I Party project participant is involved in the project as yet. The host Party India meets all the requirements for participating in a CDM project. The Ministry of Environment and Forests, the DNA of India has approved the project with a letter of approval dated 29 June 2009 /12/ which also confirms that the project assists in achieving sustainable development in India.

The project is owned by ITC Limited and the validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards India.

4.2 Project Design

The project activity involves the installation of 9 wind energy generators (WEG) with 4 WEGs having a capacity of 1.65 MW each and 5 WEGs with a capacity of 1.5 MW each, thereby aggregating to 14.1 MW of installed capacity. The electricity generated from the project activity will be used for the captive purpose of ITC limited. The geographical coordinates of the project activity falls between 08⁰ 14'N and 09⁰ 56'N and 77⁰ 26'E and 77⁰ 46'E /1/

The 1.65 MW WEGs are supplied by Vestas Wind Technology India Private Limited and the 1.5 MW WEGs are supplied by Suzlon Energy Limited. The supply, installation, commissioning, operation and maintenance of the WEGs are under the scope of the suppliers /11/. The technology used in the project activity is indigenously available in India and no transfer of technology is envisaged.

The power generated is wheeled and banked with Tamilnadu Electricity Board (TNEB) for use in ITC's packaging and printing facility located at Tiruvattiyur, Chennai, Tamilnadu /10/. The wheeling and Banking agreement between ITC Limited and TNEB dated 20 September 2008 was verified by DNV. Proposed project activity is expected to generate 38.994 GWh per year at a plant load factor (PLF) of about 31.57%

The start date of the project activity is 10 July 2008, and has been verified by DNV to be the date of the first purchase order placed on Suzlon Energy Limited for the purchase of wind energy generators /2/.

The expected operational lifetime of the project activity is 20 years which could be evidenced from the wheeling agreement with TNEB /10/. A renewable crediting period of seven years has been selected, starting from the date of registration or from 1 December 2009 which ever is later. The project activity generates electricity using renewable source of energy and displaces an equivalent power in the fossil fuel dominated southern grid of India and thereby results in approximately of 36 182 tCO₂ per annum reduction of GHG emissions.



VALIDATION REPORT

4.3 Baseline Determination

The project applies the approved simplified baseline methodology for small-scale CDM project activities AMS-I.D (version 13) titled “Grid connected renewable energy generation”. The use of this methodology is appropriate as the project activity involves electricity capacity additions through wind sources.

The project activity satisfies the applicability criteria indicated in the methodology as addressed below:

1. The total installed capacity of the renewable energy generation units (WEG) of the project activity is 14.1 MW. The installed capacity has been verified based on the purchase orders and commissioning certificates during site visits /2//13//8/ and is below the qualifying limit of 15 MW for type I small scale projects.
2. The project activity does not involve any addition to the existing facility or the project activity does not involve any retrofitting or modification of an existing facility.
3. The selected baseline methodology, AMS-I.D, version 13 is applicable to the project activity as it generates electricity using wind energy and it displaces the grid electricity.

The identified baseline scenario, in line with the methodology AMS-I.D, version 13, is the equivalent of electricity that would, in absence of the project activity, be generated by the operation of the fossil fuel based power plants connected to the southern regional grid.

As the project activity is wheeling of power to the industrial facility of ITC Limited connected to Tamilnadu grid, which is a part of southern regional grid, the baseline for this project activity is the function of the generation mix of southern region grid. The selection of the southern region grid as the grid system boundary for the project activity is in line with the EB guidance for large countries such as India. The combined margin emission coefficient for the southern regional grid of India is 0.92718 kg CO₂e/kWh, has been sourced from Central Electricity Authority (CEA) data /5/. The Central Electricity Authority, Government of India has published a database of all the operating power stations in the country. DNV confirms that the database is an official publication of the Government of India and the OM is calculated *ex ante* using the simple OM approach based on the generation-weighted average emissions per electricity unit of all fossil-fuelled generating sources serving the system over a three year period of 2005-06, 2006-07, 2007-08 /5/. BM is calculated *ex ante* based on 20% most recent capacity additions in the grid. BM is calculated *ex ante* based on the recent information available at the time of submission of PDD which is for the year 2007-08 as published in the CEA website /5/. The operating margin has been determined to be 0.9985 kg CO₂e/kWh and the build margin to be 0.713 kg CO₂e/kWh.

As per the methodology, the project boundary encompasses the physical, geographical site of the renewable generation source. The project boundary for this project activity includes wind energy generators and pooling of sub-stations. The energy generating equipments are not transferred from other project. Hence no leakage has been considered for this project activity.



VALIDATION REPORT

| | GHGs Involved | Description |
|---------------------------|----------------------|---|
| Baseline emissions | CO ₂ | For the net electricity displaced from the grid |
| Project emissions | Nil | No project emissions are envisaged in the project activity. |
| Leakage | Nil | No Leakage envisaged in the project |

The selected sources and gases are justified for the project activity.

4.4 Additionality

The additionality of the project activity has been demonstrated as per the Attachment A to Appendix B of simplified modalities and procedures for small-scale CDM project activities.

4.4.1 CDM consideration and continued action to secure CDM status

The chronology of events and the evidences provided to demonstrate the prior consideration of the CDM and the real and continued actions undertaken to secure CDM status are given below:

- Early consideration of CDM is evidenced by the proposal for installation of wind energy generators dated 6 March 2008 put up to the Corporate Management Committee and subsequent note dated 29 April 2008 according approval for proceeding with the project activity /6/. The financial evaluation considered in the proposal takes into account revenue from CER to the extent of INR 264 million per annum for 20 years. The note mentions that use of wind energy for electricity generation is in line with ITC's triple bottom philosophy and ITC's commitment to sustainability.
- The corporate approval for the proposal was received on 29 April 2008 /6/. Thereafter letters of intent were issued to the vendors for supply of WEG. The first purchase order has been placed with M/s Suzlon Energy Limited for the supply, erection and commissioning of five WEGs of capacity 1.5 MW each on 10 July 2008 /2/. This has been considered as start date of the project activity. The purchase order for supply of four WEGs of capacity 1.65 MW each has been placed with Vestas on 23 July 2008 /13/.
- The intimation to DNA regarding the project was sent on 5 September 2008.
- The WEGs have been commissioned phase wise, first two WEGs were commissioned on 20 September 2008 /8/ and the last was commissioned on 30 September 2008 /8/
- Contract with DNV for CDM validation of the project, dated 15 November 2008./18/.
- The submission of application dated 5 March 2009 to DNA /19/ and the LoA issued by DNA of India on 29 June 2009 /12/
- PDD dated 23 March 2009 was web hosted for global stake holder comments from 24 March 2009 to 22 April 2009.

From the above chronology of the events substantiated by the supporting documents DNV could verify that the process of CDM has been initiated simultaneously and revenues from CDM has been seriously considered during the decision making process.



VALIDATION REPORT

Investment analysis:

4.4.2 Investment analysis: Choice of approach

The project activity is funded totally from internal accruals that are fully equity based and there is no loan component and so in this case both project IRR and equity IRR are the same. The project proponent has chosen a bench mark approach to compare the equity IRR with that of the benchmark of expected return on equity.

4.4.3 Investment analysis: Benchmark selection

The project activity being an electricity generation project based on wind energy, which could be developed by an entity other than the project participant, the benchmark should be based on publicly available data sources. In line with this, the benchmark of expected return of equity derived from the Capital Asset Pricing Model (CAPM) considering beta values of power generating companies in India that were listed at the time of the investment decision have been considered for arriving at the benchmark of 15.94%. The benchmark identified to compare the financial attractiveness of the project activity has been verified and found to be appropriate.

4.4.4 Investment analysis: Input parameters

The proposal for the investment decision is dated 6 March 2008 /6/ where the project cost was estimated as INR 900 million based on the budgetary offers. The input values except the PLF used for the financial analysis have been based on the note dated 29 April 2008, prepared for the Corporate Management committee and have been cross checked with the purchase orders placed on the WEG suppliers and the agreements with the suppliers for operation and maintenance /11/.

The financial analysis in the note submitted to the corporate management committee has used a PLF of 30.5%. The project is based on full equity funded by internal accruals. The weighted average PLF based on the purchase orders on Suzlon /2/ and on Vestas /13/ for supply of WEGs, after applying corrections factors for grid, machine availability and wind variation works out to 31.57%. The PLF of 31.57% adopted in the investment analysis of the project activity is deemed to be conservative after comparing the PLF used by Tamilnadu Electricity Regulatory commission (TNERC), the regulatory body vested with the power to fix tariff for electricity for the region. TNERC, in its tariff order dated 18 May 2006 has considered a PLF of 27.46%. Hence the PLF considered by the project proponent for investment analysis is conservative and so is deemed appropriate.

The following documents have been verified by DNV substantiating the input parameters presented in the financial analysis:

- Purchase orders for the 5 X 1.5MW WEG with Suzlon /2/ and 4 X 1.65MW with Vestas /13/.
- Maintenance and operations agreements with Suzlon dated 22 July 2008 /11/ and with Vestas dated 28 July 2008 /11/
- Plant Load Factor (PLF) as per the purchase order on Suzlon /2/ and on Vestas /13/
- Energy wheeling agreement with TNEB dated 20 September 2008 /10/



VALIDATION REPORT

- Electricity bills of Tiruvottiyur plant of ITC Limited /20/

4.4.5 Investment analysis: Calculation and conclusion

The project has been financed entirely through the internal accruals and it has been demonstrated that the project IRR without any CDM revenues is estimated to be 11.36%. The equity IRR is lower than the benchmark IRR of 15.94% adopted by the Project participant. The IRR improves to 17.39% on considering CDM revenues.

The risk free bond rate of 7.89 % per annum taken for arriving at the benchmark considered has been checked to be correct from the latest RBI published data that was available at the time when the proposal was considered. Similarly the list of companies taken for computing the beta value was verified from the web site of Bombay stock exchange, /22/ and web sites of the respective companies. The beta values are taken from Bloomberg web site and screenshots of the same are provided in the PDD. /1/. The financial worksheets have been evidenced and all input parameters and calculations have been verified by DNV to be correct. Further more, the financial workings have also been verified and certified by a third party chartered accountant /23/

4.4.6 Investment analysis: Sensitivity analysis

A sensitivity analysis has also been conducted for variations in the range of +/- 10% for the important parameters of annual generation, project costs and OM costs. The level of variation assumed for the sensitivity analysis has been suitably justified with relevant documents pertaining to the presented analysis and has been verified by DNV, such as

- The basis for the assumed annual electricity generation / plant load factor (PLF) of 31.57% in the PDD is weighted average of both Suzlon /2/ and Vestas /13/ machines based on the respective purchase orders. It was observed that with a variation of plus 10%, in the plant load factor the equity IRR works out to 12.40% is below the benchmark of 15.94%. It was observed that at a plant load factor (PLF) of 43.5% the project IRR crosses the bench mark. The highest PLF indicated as achievable for the wind mills located in Tamilnadu as seen in the TNERC order is 31.64% /21/ which is far below the PLF of 43.5% required to cross the bench mark. It is therefore deemed unlikely that the annual generation/ plant load factor would increase the level required to cross the benchmark.
- The project has been contracted on a turn key basis to Suzlon /2/ and Vestas /13/ by the project proponent ITC Limited. It was also observed that if the project cost goes down below 18.5% then the IRR touches the benchmark of 15.94%. However this is not a likely scenario in DNV's opinion as the project has been contracted and commissioned on a turn key basis. The financial analysis has been done based on the purchase order costs and so variation in the project cost is not a likely scenario.
- The total operation and maintenance cost for all the WEG's in the project amount to only 2.04% of the investment cost and is based on the agreement with the respective suppliers. It was observed that a decrease of 10 % in the operation and maintenance cost will improve the IRR of the project to 11.64% which is still below the benchmark of 15.94%. Even if there is no operation and maintenance expenditure the IRR will not cross the benchmark.
- The project uses the electricity generated for captive purpose. The tariff avoided by project activity is equivalent to the tariff for industrial consumers. The prevailing industrial tariff has remained almost unchanged for the past 8 years. The tariff for industrial consumers is set at a higher rate than the cost of supply because of loading of



VALIDATION REPORT

cross subsidy charges. The Electricity Act 2003 and the subsequent amendments indicate that the “the tariff should be set such that it progressively reflects the cost of supply of electricity and also, reduces and eliminates cross-subsidies” and considering the actions taken to implement these clauses, the assumption of constant HT tariff at the prevailing levels for 20 years is deemed appropriate. However even with an increase of 10% in the tariff the equity IRR works out to only 13.46% which is lower than the benchmark. If the tariff increases by 22% the equity IRR will cross the benchmark.

It has been demonstrated that the IRR with the above sensitivity analysis is always less than the benchmark IRR of 15.94%. Further, the financial analysis including the assumptions for the sensitivity analysis has been certified by an independent third party chartered accountant /23/ and has been verified by DNV and thus the financial analysis and the benchmark adopted for the project activity is found to be appropriate.

Hence, it can be concluded that the proposed project activity is not a financially attractive project.

4.5 Monitoring

4.5.1 Parameters determined ex-ante

Baseline emission factor for the southern regional grid is established *ex-ante* based on the approved methodology using a combined margin approach. The combined margin emission coefficient for the southern regional grid of India has been determined to be 0.92718 kg CO₂e/kWh. The operating margin has been estimated to be 0.9985 kg CO₂ /kWh and the build margin to be 0.713 kg CO₂/kWh. The emission coefficients are determined from official data published by the Central Electricity Authority (CEA) of India in ‘CO₂ Baseline Database for the Indian Power Sector’ as stated in section 4.3 of this report. The calculations and assumptions have been verified and found to be correct by DNV.

4.5.2 Parameters monitored ex-post

The monitoring will involve metering of the net electricity exported to grid. Details of the data collection and frequency of data recording and associated formats are described and found to be adequate as verified during the site visit and complies with the requirements of the methodology.

4.5.3 Management system and quality assurance

The responsibilities and authorities for project management, procedures for monitoring and reporting, and QA/QC procedures have been systematically established and formalized. Data will be saved and archived until 2 years after the end of the crediting period.

4.6 Estimate of GHG Emissions

The calculations are well documented in line with the consolidated baseline and monitoring methodology AMS-I. D, version 13. All aspects related to the direct and indirect GHG emissions as relevant to the project activity have been addressed and are presented in a transparent manner.

Baseline emission: In accordance with AMS-I.D, version 13 the baseline emissions have been calculated as the product of net electricity supplied to the grid and the combined margin grid emission factor. Combined margin grid emission factor for the southern regional grid that is



VALIDATION REPORT

relevant to the project activity grid has been fixed ex ante for the entire crediting period, as detailed in section 4.3 of this report.

Project emission and Leakage: The project is electricity generation from the wind power and no project emissions and leakage is associated with the project activity.

Based on the above emission factor and estimated annual electricity generated, the emission reductions from the project activity has been determined to be of 36 182 t CO₂ per annum. The baseline emission estimate can be replicated using the data and parameter values provided in the PDD. The data sources mentioned have been verified by DNV

In summary, the GHG calculations are complete and transparent, and their accuracy has been verified by DNV.

4.7 Environmental Impacts

The proposed project activity contributes to generation of electricity from renewable source and the investment is expected to contribute to the economic development of the region. Thus, the project activity is expected to have only beneficial impacts and no adverse impacts are foreseen. As per the Ministry of Environment and Forests (MoEF) notification /14/ an environmental impact assessment is required only for projects included in the schedule of the notification and wind power projects are not mentioned in the schedule, so no environmental impact assessment is required as per statute for this project. ITC Limited has obtained the 'No Objection Certificate' from TNEB for installation dated 8 September 2008 /15/ and the government of Tamil Nadu electrical inspectorate had given the consent for operation vide letter dated 19 September 2008 /16/ individually for each machine. DNV has verified the letters.

4.8 Comments by Local Stakeholders

The stakeholder meeting was conducted on 23 October 2008 and 24 October 2008 at the project site. The local stakeholders identified for the project activity were the villagers, the land owners, local NGO's, representatives from Suzlon Energy Limited and Vestas The villagers were invited through a notice circulated in advance about the conduct of the meeting /7/. A brief description on the project was provided in the meeting and project proponent invited comments of the stakeholders on the project. The project did not receive any adverse comments. Minutes of the stakeholder meeting, dated 24 October 2008, has been verified /17/. DNV was able to confirm the adequacy of the local stakeholder consultation process. DNV has checked all the questionnaires received. The survey shows that the project receives support from the local people

4.9 Comments by Parties, Stakeholders and NGOs

The PDD of 23 March.2009 was made publicly available on UNFCCC <https://cdm.unfccc.int/Projects/Validation/DB/APAETJ83XR86TKFRRFNGA84QYIMD25/view.html> and Parties, stakeholders and NGOs were invited to provide comments during a 30 days period from 24 March, 2009 to 22 April 2009.

One comment was received and is given (in unedited form) in the below text box.

14.1 MW grid connected wind energy project in Tamilnadu by ITC Limited.

| | |
|-----------------|-------|
| Host party(ies) | India |
|-----------------|-------|



VALIDATION REPORT

| | | | | | | |
|---|--|---|--|--|--|--|
| Methodology(ies) | AMS-I.D. ver. 13 | | | | | |
| Estimated annual reductions* | 34,814 | | | | | |
| DOE/AE | Det Norske Veritas Certification AS | | | | | |
| Period for comments | 24 Mar 09 - 22 Apr 09 | | | | | |
| The operational/applicant entity working on this project has decided to make the Project Design Document (PDD) publicly available directly on the UNFCCC CDM website. | | | | | | |
| PDD |  PDD (1520 KB) | | | | | |
| Submission of comments to the DOE/AE | <p>Compilation of submitted inputs: Commendable Initiative by the best corporate in India. Of course their tax liability and depreciation would be a big benefit.</p> <p>Submitted by: A.R.Ravi Kumar</p> <hr/> <p>The comment period is over.</p> <table border="1"> <tr> <td>http://cdm.unfccc</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | http://cdm.unfccc | | | | |
| http://cdm.unfccc | | | | | | |

* Emission reductions in metric tonnes of CO2 equivalent per annum that are based on the estimates provided by the project participants in unvalidated PDDs

Client's response to the Global stakeholder comment

Tax liability and depreciation has been considered in the financial calculation and has been provided to DNV for verification

How DNV has considered the comment received in its validation

The tax calculations have been done as per section 80IA of the Income Tax Act and depreciation as per section 32 rule 5 of Income Tax Act that is applicable for wind mills which are appropriate for the project activity. DNV has verified the same and could confirm that depreciation rate and tax that have been considered are as permissible by relevant law for the project activity.

APPENDIX A

CDM VALIDATION PROTOCOL

Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities

| Requirement | Reference | Conclusion |
|---|--|---|
| About Parties | | |
| 1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3. | Kyoto Protocol Art.12.2 | OK. |
| 2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC. | Kyoto Protocol Art.12.2. | CAR-1 OK. |
| 3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved. | Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a | CAR-1 OK. |
| 4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof. | Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a | CAR-1 OK. |
| 5. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties. | Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2 | OK The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) towards India |
| 6. Parties participating in the CDM shall designate a national authority for the CDM. | CDM Modalities and Procedures §29 | The Designated National Authority (DNA) of India is “Ministry of Environment & Forest” (MOEF). |

| Requirement | Reference | Conclusion |
|---|---|--|
| 7. The Host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol. | CDM Modalities §30/31a | The host country India has ratified the Kyoto protocol on August 26, 2002. |
| 8. The participating Annex I Party's assigned amount shall have been calculated and recorded. | CDM Modalities and Procedures §31b | NA |
| 9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7. | CDM Modalities and Procedures §31b | NA |
| About additionality | | |
| 10. Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity. | Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43 | CAR-1 OK |
| About forecast emission reductions and environmental impacts | | |
| 11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change. | Kyoto Protocol Art. 12.5b | OK |
| For large-scale projects only | | |
| 12. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out. | CDM Modalities and Procedures §37c | NA |
| About small-scale project activities (if applicable) | | |

| Requirement | Reference | Conclusion |
|---|--|--|
| 13. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakech Accords and shall not be a debundled component of a larger project activity. | Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c | The project activity involves installation of four WEG's, each of 1.65 MW and five WEG of 1.5 MW, with a total installed capacity of 14.1 MW which is less than limit of 15 MW for small scale projects. |
| 14. The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and use the simplified baseline and monitoring methodology for that project category. | Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e | OK |
| 15. If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented. | Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c | NA |
| About stakeholder involvement | | |
| 16. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received. | CDM Modalities and Procedures §37b | OK |
| 17. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available. | CDM Modalities and Procedures §40 | The PDD of “23 March 2009” was made publicly available on UNFCCC’s website <a)"="" href="http://cdm.unfccc.int/Projects/Validation/DB/APAET/J83XR86TKFRRFNGA84/QYIMD25/view.">http://cdm.unfccc.int/Projects/Validation/DB/APAET/J83XR86TKFRRFNGA84/QYIMD25/view.) |

| Requirement | Reference | Conclusion |
|--|---|--|
| | | and Parties, stakeholders and NGOs were invited to provide comments during a 30 days period from 24 March, 2009 to 22 April 2009. One comment has been received. ITC to response to the comments CAR-2 OK. |
| Other | | |
| 18. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board. | CDM Modalities and Procedures §37e | OK |
| 19. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances. | CDM Modalities and Procedures §45c,d | CL-4 OK. |
| 20. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure. | CDM Modalities and Procedures §47 | OK |
| 21. The project design document shall be in conformance with the UNFCCC CDM-PDD format. | CDM Modalities and Procedures Appendix B, EB Decision | OK |
| 22. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP. | CDM Modalities and Procedures §37f | CL-3 OK. |

Table 2 Requirements Checklist

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|--|------------|----------|--|--------------|--------------|
| A. General Description of Project Activity <i>The project design is assessed.</i> | | | | | |
| A.1. Project Boundaries <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i> | | | | | |
| A.1.1. Are the project's spatial boundaries (geographical) clearly defined? | 1 | DR/I | The Project is located at Theni & Tirunelveli District, Tamil Nadu State, India. Latitude between 9° 53' 19.2" N and 8° 15' 01.4"N and longitude between 77° 26' 24.3"E and 77° 46' 42.6"E . | | OK |
| A.1.2. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined? | /1/ /3/ | DR/ I | The projects system boundary includes, the wind turbines (4 x 1.65 MW, 5 x 1.5 MW), sub-station, TNEB grid and the southern regional grid to which the power plant is connected. The electricity generated is wheeled to the packaging and printing facility of ITC located at Tiruvottiyur, Chennai, Tamil Nadu in India. | | OK |
| A.2. Participation Requirements <i>Referring to Part A, Annex 1 and 2 of the PDD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.</i> | | | | | |
| A.2.1. Which Parties and project participants are participating in the project? | 1 | /DR/ | The project is being proposed as a unilateral project. India is the host party and ITC | | OK |

* MoV = Means of Verification, DR= Document Review, I= Interview
CDM Validation 2008-1060- rev.- 01

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|------------|-----------|---|------------------|-----------------|
| | | | Limited is the project proponent. | | |
| A.2.2. Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by an involved Party? | | /DR/ I | DNA approval to be provided. No Annex 1 party is identified in PDD. | CAR-1 | OK. |
| A.2.3. Do all participating Parties fulfil the participation requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated a National Authority | /1/ | DR | Host party India has ratified the Kyoto Protocol on 22nd August 2002. Ministry of Environment & Forest (MOEF), Govt of India is the Host party DNA. | CAR-1 | OK |
| A.2.4. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance. | 1 | DR | No Annex 1 party has been identified for the project. | | OK |
| A.3. Technology to be employed <i>Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.</i> | | | | | |
| A.3.1. Does the project design engineering reflect current good practices? | /1/ /2/ | DR/I | The wind farm utilizes 5 machines of Suzlon model S-82 WTG 1.5MW and 4 machines of Vestas model V82 approved by Centre for | | OK |

* MoV = Means of Verification, DR= Document Review, I= Interview
 CDM Validation 2008-1060- rev.- 01

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|-------------|------|---|------------------|--------------|
| | | | Wind Energy Technology, Government of India. | | |
| A.3.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country? | /1/ | DR/I | Yes, the project uses technology that is available in the country. | | OK |
| A.3.3. Does the project make provisions for meeting training and maintenance needs? | /1/ /11/ | DR/I | The operation & maintenance of wind mills is under the responsibility of, suppliers of the machines namely Suzlon and Vestas. Hence no specific training of the personnel from ITC is required. | | OK |
| A.4. Contribution to Sustainable Development | | | | | |
| <i>The project's contribution to sustainable development is assessed.</i> | | | | | |
| A.4.1. Has the host country confirmed that the project assists it in achieving sustainable development? | /1/ | DR/I | DNA approval to be provided | CAR-1 | OK. |
| A.4.2. Will the project create other environmental or social benefits than GHG emission reductions? | /1/ | DR | No the project will not create any other environmental or social benefits other than GHG emission reductions. | | OK |
| A.5. Small scale project activity | | | | | |
| <i>It is assessed whether the project qualifies as small-scale CDM project activity</i> | | | | | |
| A.5.1. Does the project qualify as a small scale CDM project activity as defined in paragraph 6 (c) of | /1/ | DR | Yes. The project qualifies as a small scale CDM activity, as the installed capacity of the | CL-1 | OK |

* MoV = Means of Verification, DR= Document Review, I= Interview
 CDM Validation 2008-1060- rev.- 01

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|------------|-----------|---|-----------------|-----------------|
| decision 17/CP.7 on the modalities and procedures for the CDM? | | | project is 14.1 MWe which is well below the ceiling limit of 15 MWe specified in paragraph 6 (c) of decision 17/CP.7 for small scale project activities. ITC to detail in section B2 of the PDD as to why the project falls under the small scale category. | | |
| A.5.2. Is the small scale project activity not a debundled component of a larger project activity? | /1/ | DR /I/ | The project proponent has not registered or applied for registration of another CDM small scale project activity within the last two years in the same project category and technology measure within 1 KM of the project boundary. Hence the project activity is not a de-bundled component of a large project activity. | | OK |
| B. Project Baseline <i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i> | | | | | |
| B.1. Baseline Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i> | | | | | |
| B.1.1. Does the project apply an approved methodology and the correct version thereof? | /1/ /3/ | DR | The project applies the approved baseline methodology of AMS I D Version 13 titled “Grid connected renewable electricity generation”. | | OK |

* MoV = Means of Verification, DR= Document Review, I= Interview
CDM Validation 2008-1060- rev.- 01

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|--|------------|------|--|-----------------|-----------------|
| B.1.2. Are the applicability criteria in the baseline methodology all fulfilled? | /1/ /3/ | DR | Yes. The baseline methodology is applicable to the project activity complies with the applicability criteria of a) being an grid connected renewable energy project and b) the installed capacity of 14.1 MW is within the limit of 15 MW. | | OK |
| B.2. Baseline Scenario Determination <i>The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.</i> | | | | | |
| B.2.1. What is the baseline scenario? | /1/ /3/ | DR/I | The baseline scenario is that in the absence of the project activity, equivalent power would have been drawn / displaced from the thermal power dominated southern regional grid of India, or by new capacity additions in the grid. This baseline scenario is acceptable as it was verified that prior to the implementation of the project activity ITC was drawing (over its own captive generation units) power from the southern grid to meet the requirements of its packaging and printing facility at Chennai. | | OK |
| B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one? | /1/ /3/ | DR/I | The methodology ID /Version 13 adopted for the project activity describes the baseline scenario. | | OK |
| B.2.3. Has the baseline scenario been determined according to the methodology? | /1/ | DR/I | Yes. The baseline scenario has been determined according to the methodology. | CL-2 | OK |

* MoV = Means of Verification, DR= Document Review, I= Interview
 CDM Validation 2008-1060- rev.- 01

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|--------------------|------------|------|--|-----------------|-----------------|
| | /3/ /5/ | | <p>The baseline emission factor for the project has been calculated as the weighted average of the operating margin (OM) and the build margin (BM) in the ratio of 75:25 as applicable for wind projects. The OM and BM values have been sourced from the values published by Central Electricity Authority (CEA), Government of India. As per CEA, these values are calculated based on the new “Tool to calculate the emission factors for an electricity system” by CDM Executive Board.</p> <p>The OM for southern regional grid for the three years 2005-06,2006-07 and 2007-08, calculated by simple OM method based on the latest data from CEA available at the time of publishing the PDD is used for calculating the average OM. Using these the average value of OM for the three years comes to 1.00. The latest value for BM available for the year 2007-08 in CEA data base is 0.71. The CM calculated using the above values for OM & BM at the applicable ratio is 0.929 t CO₂/MWh.</p> <p>ITC to recheck and provide the calculation details of OM, BM and CM for verification</p> | | |

* MoV = Means of Verification, DR= Document Review, I= Interview
 CDM Validation 2008-1060- rev.- 01

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|-------------------|------|---|------------------|-----------------|
| B.2.4. Has the baseline scenario been determined using conservative assumptions where possible? | /1/ | DR/I | Yes. | | OK |
| B.2.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations? | /1/ | DR/I | The baseline is in line with the national & sectorial policy which is to encourage use of non-conventional and renewable sources of energy. | | OK |
| B.2.6. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced? | /1/ | DR/I | Yes. | | OK |
| B.2.7. Have the major risks to the baseline been identified? | /1/ /6/ /2/ | DR/I | There are no major risks perceived to the proposed baseline. | | OK |
| B.3. Additionality Determination <i>The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.</i> | | | | | |
| B.3.1. Is the project additionality assessed according to the methodology? | /1/ /4/ | DR/I | The project additionality has been assessed as per Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities. | | OK |
| B.3.2. Are all assumptions stated in a transparent and conservative manner? | /1/ | DR/I | In order to establish additionality of the | CAR-3 | OK |

* MoV = Means of Verification, DR= Document Review, I= Interview
CDM Validation 2008-1060- rev.- 01

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|--------------------|------------|------|--|-----------------|-----------------|
| | /6/ /2/ | | <p>project, ITC have detailed the investment barrier faced by the project activity. The investment in the project is INR 897.2 million wholly as equity. The post tax project IRR without CDM is 10.89%.The benchmark is 18.33%.</p> <p>ITC to provide the following clarification with respect to the investment barrier calculations.</p> <p>Assumptions</p> <p>1)) The assumptions for the PLF values used in the financial calculations need to be demonstrated for the conservativeness in light of the PLF values used at the time of decision making. .</p> <p>2) The basis and calculation of O& M charges to be provided.</p> <p>3) Then excel sheet to indicate the units, reference source, month and year of data appropriately. The copy of documents from where reference data is used to be provided.</p> <p>4) The basis for calculating the percentage of energy banked to be provided</p> <p>5) The conservativeness of the benchmark needs to be demonstrated in light of the Guidance on investment analysis of EB41 annex 45. Also the risk free rate used for the</p> | | |

* MoV = Means of Verification, DR= Document Review, I= Interview
CDM Validation 2008-1060- rev.- 01

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|------|------|--|-----------------|-----------------|
| | | | <p>benchmark and choice of the period needs to be justified.</p> <p>6) ITC to confirm whether all companies related to energy have been considered while calculating the beta and confirm the choice is in compliance with clause 14 of annex 45 of EB 41. The supporting evidence for the beta values to be provided.</p> <p>7) ITC to carry out sensitivity analysis for all major parameters as detailed in EB 41 Annex 45 the guidance for investment analysis and should show at which point the variable taken for sensitivity analysis crosses the benchmark.</p> <p>8) ITC to detail the calculation of IRR with CDM revenues and to confirm that treatment of tax and depreciation in the IRR calculation is as per S.No 5 of EB 41 Annex 45 the guidance for investment analysis</p> | | |
| B.3.3. Is sufficient evidence provided to support the relevance of the arguments made? | /1/ | DR/I | <p>ITC to provide the electricity bill of the packaging unit for the period December 07 to March 08 and from September 09 to April 09. The bills for generation from WEG since commissioning to April 09 may also be provided.</p> <p>ITC may also provide the connected load details of the packing and printing unit.</p> | CR-3 | OK |
| B.3.4. If the starting date of the project activity is before the date of validation, has sufficient evidence | /1/ | DR/I | Start date is 10 July 2008, the date of issue of | CR-3 | OK |

* MoV = Means of Verification, DR= Document Review, I= Interview
 CDM Validation 2008-1060- rev.- 01

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|--------------------|------|---|-----------------|-----------------|
| <p>been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?</p> | <p>/2/ /6/</p> | | <p>Purchase order to Suzlon for supply of WEGs. The note dated 6 March 2008 seeking approval of the Corporate Management Committee for the installation of WEG indicates awareness of CDM The note mentions that revenues from CDM will only improve the IRR of the project to 13.2% from 8.7% and thereby crossing the company hurdle rate. Even though the start date of the project is 10 July 2008, ITC have informed DNA of India of the details of the project by their letter dated 5 September 2008. The chronology of events mentioned under section B.5 of the PDD indicates continues action. ITC to revise the PDD to include in the chronology of events milestones in the action related to obtaining CDM status for the project. ITC to provide copy of the proposal put up and its approval by the PPB MC meeting of 16 January 2008.</p> | | |
| <p>B.4. Calculation of GHG Emission Reductions – Project emissions <i>It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i></p> | | | | | |

* MoV = Means of Verification, DR= Document Review, I= Interview
CDM Validation 2008-1060- rev.- 01

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|------------|------|--|-----------------|-----------------|
| B.4.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner? | 1 | DR | Since the project is based on wind energy there is no project GHG emission | | OK |
| B.5. Calculation of GHG Emission Reductions – Baseline emissions <i>It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i> | | | | | |
| B.5.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner? | /1/ /5/ | DR/I | <p>The calculations are documented in a transparent and clear manner. The baseline emissions are calculated as the product of the net electricity generated at the project site and the grid emission factor of the southern regional grid of India.</p> <p>The net electricity generated is monitored by the project proponent and the grid emission factor is fixed ex-ante at 0.929 t CO₂/MWh .</p> <p>ITC to provide the calculation sheet for the ex-ante value fixed.</p> | CL-2 | OK |
| B.5.2. Have conservative assumptions been used when calculating the baseline emissions? | 1 | DR | Yes. | | OK |
| B.5.3. Are uncertainties in the baseline emission estimates properly addressed? | 1 | DR | Yes. | | OK |

* MoV = Means of Verification, DR= Document Review, I= Interview
 CDM Validation 2008-1060- rev.- 01

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|--|------|------|---|-----------------|-----------------|
| <p>B.6. Calculation of GHG Emission Reductions – Leakage</p> <p><i>It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i></p> | | | | | |
| B.6.1. Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner? | 1 | DR | Since there is no transfer of energy generating equipments from or to another activity, there is no leakage. | | OK |
| B.6.2. Have conservative assumptions been used when calculating the leakage emissions? | 1 | DR | Refer B 6.1 | | OK |
| B.6.3. Are uncertainties in the leakage emission estimates properly addressed? | 1 | DR | Refer B 6.1 | | OK |
| <p>B.7. Emission Reductions</p> <p><i>The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.</i></p> | | | | | |
| B.7.1. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change. | 1 | DR/I | Since the project activity displaces energy generation from fossil fuel sources the greenhouse gas emission are real, measurable and long term. | | OK |
| <p>B.8. Monitoring Methodology</p> <p><i>It is assessed whether the project applies an appropriate</i></p> | | | | | |

* MoV = Means of Verification, DR= Document Review, I= Interview
 CDM Validation 2008-1060- rev.- 01

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|------|------|---|-----------------|-----------------|
| <i>monitoring methodology.</i> | | | | | |
| B.8.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner? | 1 | DR | In line with the monitoring methodology, the project activity will monitor the net electricity generation and supply to the grid. ITC to detail in the monitoring plan whether the net generation and supply to grid by individual wind mills are being monitored by separate meters. The class, type, accuracy level of the meters, the calibration frequency and mode also to be included. | CL-4 | OK |
| B.8.2. Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later? | 1 | DR | ITC to include details of data recording, storage & retrieval plan in the PDD. | CL-4 | OK |
| B.9. Monitoring of Project Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i> | | | | | |
| B.9.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period? | 1 | DR | There is no project emission as the project utilises wind power for electricity generation. | | OK |
| | | | | | |

* MoV = Means of Verification, DR= Document Review, I= Interview
CDM Validation 2008-1060- rev.- 01

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|--|------|------|---|-----------------|-----------------|
| B.10. Monitoring of Baseline Emissions <i>It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.</i> | | | | | |
| B.10.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period? | 1 | DR | Refer B.8.1 | CL-4 | OK |
| B.10.2. Are the choices of baseline GHG indicators reasonable and conservative? | 1 | DR/I | Yes. As the project displaces grid power generated by fossil fuel combustion, CO ₂ emission is taken as the main emission indicator. The choice is reasonable as majority of the power plants connected to the grid are fossil fuel based and are highly carbon intensive. | | OK |
| B.10.3. Is the measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate? | 1 | DR/I | Refer B.8.1 . | CL-4 | OK |
| B.10.4. Is the measurement <i>equipment</i> described and deemed appropriate? | 1 | DR | Refer B.8.1 . | CL-4 | OK |
| B.10.5. Is the measurement <i>accuracy</i> addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements? | 1 | DR | Refer B.8.1 . | CL-4 | OK |

* MoV = Means of Verification, DR= Document Review, I= Interview
CDM Validation 2008-1060- rev.- 01

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|--|------|------|--|-----------------|-----------------|
| B.10.6. Is the measurement <i>interval</i> for baseline data identified and deemed appropriate? | 1 | DR | Refer B.8.1 This is to be detailed in the PDD. | CL4 | OK |
| B.10.7. Is the registration, <i>monitoring, measurement</i> and <i>reporting</i> procedure defined? | 1 | DR | Refer B.8.1 This is not stated in the PDD and needs to be included / clarified. | CL4 | OK |
| B.10.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed? | 1 | DR | Refer B.8.1 | CL4 | OK |
| B.10.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation) | 1 | DR | Refer B.8.1 This is not stated in the PDD and needs to be included / clarified. | CL4 | OK |
| B.11. Monitoring of Leakage | | | | | |
| <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i> | | | | | |
| B.11.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage? | 1 | DR | Refer B.6.1. There is no leakage as there is no transfer of equipment from another project activity. | | OK |
| B.12. Monitoring of Sustainable Development Indicators/ Environmental Impacts | | | | | |
| <i>It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over</i> | | | | | |

* MoV = Means of Verification, DR= Document Review, I= Interview
CDM Validation 2008-1060- rev.- 01

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|------|------|---|------------------|-----------------|
| <i>time.</i> | | | | | |
| B.12.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country? | 1 | DR | The DNA approval is to be submitted. | CAR-1 | OK |
| B.12.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts? | 1 | DR | Same as above. B.12.1 | CAR-1 | OK |
| B.12.3. Are the sustainable development indicators in line with stated national priorities in the Host Country? | 1 | DR | Refer B.12.1 | CAR-1 | OK |
| B.13. Project Management Planning <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i> | | | | | |
| B.13.1. Is the authority and responsibility of overall project management clearly described? | 1 | DR | ITC to detail the project management structure and procedure in the PDD. | CL-5 | OK |
| B.13.2. Are procedures identified for training of monitoring personnel? | 1 | DR | This is not pertinent as the monitoring of the machines is under the purview of the O&M contractor Suzlon and Vestas who monitor and send the daily generation data of each of the machines to ITC. | | OK |
| B.13.3. Are procedures identified for emergency | 1 | DR | Being a project based on wind power for | | OK |

* MoV = Means of Verification, DR= Document Review, I= Interview
CDM Validation 2008-1060- rev.- 01

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|--------------------|------|---|-----------------|-----------------|
| preparedness for cases where emergencies can cause unintended emissions? | | | electricity generation, there will be no unintended emissions. | | |
| B.13.4. Are procedures identified for review of reported results/data? | 1 | DR | Refer B.8.1 This is not stated in the PDD and needs to be included. | CL-4 | OK |
| B.13.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting? | 1 | DR | Refer B.8.1 This is not stated in the PDD and needs to be included. | CL-4 | OK |
| C. Duration of the Project/ Crediting Period <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i> | | | | | |
| C.1.1. Are the project's starting date and operational lifetime clearly defined and evidenced? | /1/ /2/ /10/ | DR/I | The start date of project activity is 10 July 2008, the date of agreement with Suzlon for supply of WEGs, with an operational life time of 20 years. | | OK |
| C.1.2. Is the start of the crediting period clearly defined and reasonable? | 1 | DR | The start date of the crediting period is 1 August 2009 or registration date whichever is later and is reasonable. ITC have opted for renewable crediting period of 7 years duration. | | OK |
| D. Environmental Impacts <i>Documentation on the analysis of the environmental impacts will</i> | | | | | |

* MoV = Means of Verification, DR= Document Review, I= Interview
CDM Validation 2008-1060- rev.- 01

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|------------|------|---|-----------------|-----------------|
| <i>be assessed, and if deemed significant, an EIA should be provided to the validator.</i> | | | | | |
| D.1. For Small-scale projects | | | | | |
| D.1.1. Does host country legislation require an analysis of the environmental impacts of the project activity? | 1 | DR | No. As per schedule 1 of EIA notification 2006 the project activity does not require to carry out any environmental impact assessment. | | OK |
| D.1.2. Does the project comply with environmental legislation in the host country? | 1 | DR/I | Yes. The project has got approval from the Tamilnadu electrical inspectorate vide letter date 19 September 2008 | | OK |
| D.1.3. Will the project create any adverse environmental effects? | 1 | DR | Being a wind power project no adverse environmental effects are foreseen. | | OK |
| D.1.4. Have environmental impacts been identified and addressed in the PDD? | 1 | DR | Being a wind power project, the project is not expected to have any significant impact on the environment. | | OK |
| E. Stakeholder Comments | | | | | |
| <i>The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.</i> | | | | | |
| E.1.1. Have relevant stakeholders been consulted? | /1/ /7/ | DR/I | Yes. Stake holders meeting was held at Vallalnathi Theni on 23 October 2008 and on 24 October 2008 at Radhapuram,,Tirunelveli. in which representatives from the villages participated. | | OK |
| E.1.2. Have appropriate media been used to invite comments by local stakeholders? | /1/ /7/ | DR/I | Yes. Notice of the meeting were distributed and displayed to inform the stake holders of | | OK |

* MoV = Means of Verification, DR= Document Review, I= Interview
 CDM Validation 2008-1060- rev.- 01

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|------|------|--|-----------------|-----------------|
| | | | the consultation. | | |
| E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws? | 1 | DR | This is not specifically required for wind power projects as per current Indian legislation. | | OK |
| E.1.4. Is a summary of the stakeholder comments received provided? | 1 | DR | A summary of the comments received has been provided in the PDD. | | OK |
| E.1.5. Has due account been taken of any stakeholder comments received? | 1 | DR/I | No adverse comments have been received | | OK |

Table 2b: Additional requirements checklist for VVM version 1 (EB 44)

| | | | | | |
|---|------------|------------|--|------------------|----|
| A.1. Letter of approval | | | | | |
| A.1.1 Is the LoA received directly from the DNA or through the project participant. | /1/ | /D/ /I/ | The letter of approval from DNA is yet to be received. | CAR-1 | OK |
| A.2. Project design | | | | | |
| A.2.1 Does the PDD describe the CDM project activity with all relevant elements in a transparent and accurate way? | /1/ | /D/ /I/ | Yes. | | OK |
| A.2.2 Has the CDM project activity at the start of the validation been constructed or does the CDM project activity use existing facilities or equipment? | /1/ /8/ | /D/ /I/ | The CDM project activity was constructed at the start of validation activity. The project activity has used only new WEG machines. | | OK |

* MoV = Means of Verification, DR= Document Review, I= Interview
CDM Validation 2008-1060- rev.- 01

| | | | | |
|--|-------------------|------------|---|----|
| | | | The machines were commissioned during the period 20 September to 30 September 2008. The commissioning certificates issued were verified during site visit. | |
| A.2.3 Is the project a large scale project, a small scale project with average annual emission reductions above 15 000 tonnes or a bundled small scale project? Has on-site visit been carried out? | /1/ | /D/ /I/ | The project activity is a small scale project activity with average annual emission reduction above 15000 tonnes. Site visit was carried out on from 28 April to 30 April 2009. | OK |
| A.2.4 Does the project activity involved alteration of existing installations? If so, have the differences between pre-project and post-project activity been clearly described in the PDD? | /1/ /2/ /8/ | /D/ /I/ | No. The project activity involved installation of new machines at site. This was verified with the purchase orders during site visit of the installations. | OK |
| A.3. Project emissions not addressed by the methodology | | | | |
| A.3.1 Does the methodology describe all project emission source for the project activity that contributes all 1% of the emission reductions? Sources that the methodology considers not to take into account are not relevant (e.g. cement and iron consumption for building hydropower plants). | /1/ | /D/ | The methodology does not specifically detail all the project emissions. The project activity is generation of electricity from wind power and so there is no significant emission from the project activity. | OK |
| A.4. Documentation of baseline emissions | | | | |
| 1. A.4.1 Documentation of the baseline determination: a. All assumptions and data used by the project participants are listed in the PDD and related document to be submitted for registration. The data are properly referenced. | 1 | /D/ | Yes. All data and assumptions are detailed in the PDD and are conservative and reasonable. The relevant national and sectoral policy has been considered and methodology correctly applied. | OK |

| | | | | | |
|---|------------|------------|--|--|-----------|
| <p>b. All documentation is relevant as well as correctly quoted and interpreted.</p> <p>c. Assumptions and data can be deemed reasonable</p> <p>d. Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD.</p> <p>e. The methodology has been correctly applied to identify what would occurred in the absence of the proposed CDM project activity</p> | | | | | |
| <p>A.5.Documentation of the calculations</p> | | | | | |
| <p>2. A.5.1 Algorithms and/or formulae used to determine emission reductions</p> <ul style="list-style-type: none"> • All assumptions and data used by the project participants are listed in the PDD and related document submitted for registration. The data are properly referenced • All documentation is correctly quoted and interpreted. • All values used can be deemed reasonable in the context of the project activity • The methodology has been correctly applied to calculate the emission reductions and this can be replicated by the data provided in the PDD and supporting files to be submitted for registration. | <p>/I/</p> | <p>/D/</p> | <p>The PDD lists all assumptions, data and its source. The calculations have been done as per the methodology AMS I D version 13 and the grid emissions have been calculated as per the tool to calculate the emission factor for an electricity system.</p> | | <p>OK</p> |
| <p>A.6. Implementation of the monitoring plan</p> | | | | | |
| <p>A.6.1 How were the plans for implementation of the monitoring plan, data management, QA/QC procedures assessed? To what extent can the emission reductions achieved by the project by monitored ex-post and verified later by a DOE?</p> | <p>/I/</p> | <p>/D/</p> | <p>Please refer B.8.1 and B .9.1.</p> | | <p>OK</p> |

| A.7. CDM consideration prior to starting date | | | | | |
|---|---|-----|---|-----------------|----|
| A.7.1 The prior consideration of CDM for the project activity complies with EB41 annex 46 | 1 | /D/ | <p>The start date of the project activity is 10 July 2008. This is the date on which purchase order was placed on Suzlon for supply of WEG. mechanical work construction works was issued. The note dated 6 March 2008 seeking approval of the Corporate Management Committee for the installation of WEG indicates awareness of CDM.</p> <p>ITC to revise the PDD to include in the chronology of events milestones in the action related to obtaining CDM status for the project.</p> <p>Refer B.3.4 in Table 2a.</p> | CL-3 | OK |

Table 3 Resolution of Corrective Action and Clarification Requests

| Draft report clarifications and corrective action requests by validation team | Ref. to checklist question in table 2 and 2b | Summary of project owner response | Validation team conclusion |
|--|--|--|---|
| CAR 1 LoA from DNA of India to be submitted. | A.2.2 A.2.3 A.4.1 B.12.1 B.12.2 Table 2b A1.1 | Letter No 4/9/2009 of approval from DNA of India dated 29 June 2009 has been obtained. | OK. The letter of approval has been verified. The same has also been confirmed from the DNA India website http://www.cdmindia.nic.in/cdmindia/projectList.jsp?search=search Hence the CAR is closed. |
| CAR-2 Project Proponent is requested to give their response to the public comment received during 30 Day stakeholder consultation period, | Table 1-17 | The comment visible on the UNFCCC website (http://cdm.unfccc.int/Projects/Validation/D/B/APAETJ83XR86TKFRRFNGA84QYIM/D25/view.html) is Commendable Initiative by the best corporate in India. Of course their tax liability and depreciation would be a big benefit. Submitted by: A.R.Ravi Kumar Response- Tax liability and depreciation has been considered in the financial calculation and has been provided to DNV for verification | The tax calculations have been done as per section 80IA of the income tax act and depreciation as per section 32 rule 5 that is applicable for wind mills which are appropriate for the project activity. Hence the CAR is closed. |

| Draft report clarifications and corrective action requests by validation team | Ref. to checklist question in table 2 and 2b | Summary of project owner response | Validation team conclusion |
|---|--|---|---|
| <p>CAR-3 ITC to provide the following clarification with respect to the investment barrier calculations.</p> <p>1) The assumptions for the PLF values used in the financial calculations need to be demonstrated for the conservativeness in light of the PLF values used at the time of decision making.</p> | <p>B 3.2 B 3.3</p> | <p>1. The PLF has been considered based on the following:</p> <p>a. PLF assumed at the time of investment decision – This was based on actual generation data of the site from Suzlon and a near-by site for Vestas, as there were no previous installations at the project site for Vestas.</p> <p>Based on the actual performance of similar turbines on nearby sites, the PLF works out to 30.5%. The relevant Data has been provided to DNV during the site visit.</p> <p>b. Generation estimates provided by the WEG suppliers in the Purchase Orders adjusted for the following: (based on TNERC order dated 18/05/2006)- Suzlon</p> <ul style="list-style-type: none"> • 95% grid availability • 2% line losses • 95% machine availability (already included in the Purchase Order) | <p>The PLF has been revised based on the offer and subsequent clarifications received from the suppliers.</p> |

¹ Para 11 of EB 41, Annex 45

² <http://rbidocs.rbi.org.in/rdocs/Publications/PDFs/87503.pdf>

³ Dr. Damodaran, one of the foremost authorities in the world in the field of Investment Analysis

| Draft report clarifications and corrective action requests by validation team | Ref. to checklist question in table 2 and 2b | Summary of project owner response | Validation team conclusion |
|--|--|---|---|
| <p>2) The basis and calculation of O& M charges to be provided.</p> <p>3) Then excel sheet to indicate the units, reference source, month and year of data</p> | | <p>Vestas</p> <ul style="list-style-type: none"> • 95% grid availability • 2% line losses • 95% machine availability <p>The PLF works out to 31.57%.</p> <p>c. PLF considered by TNERC for calculating tariff of wind energy projects, this is 27.46%. (Calculation sheet enclosed for reference)</p> <p>In order to be conservative, we have considered the highest of the three PLF values above for IRR calculations.</p> <p>2.O&M charges are according to the O&M contract.</p> <p>Suzlon- 1.86 million (3rd year, inclusive of 12.36% service tax) per WEG</p> <p>Vestas- 2.247 million (3rd year, inclusive of 12.36% service tax) per WEG</p> <p>So the total amount is 1.86*5 million + 2.247*4 million=18.29 million or 2.04% of the total capital cost</p> <p>2 years of free O&M and 5% escalation from 4th year.</p> <p>3.The excel sheet has been updated to</p> | <p>The O & M charges are taken as per the contracts with the respective suppliers.</p> <p>The excel sheets have been corrected.</p> |

| Draft report clarifications and corrective action requests by validation team | Ref. to checklist question in table 2 and 2b | Summary of project owner response | Validation team conclusion |
|---|--|--|---|
| <p>appropriately. The copy of the supporting documents from where reference data is used is to be provided.</p> <p>4) The basis for calculating the percentage of energy banked to be provided along with supporting documents.</p> <p>5) The conservativeness of the benchmark needs to be demonstrated in light of the Guidance on investment analysis of EB41 annex 45. Also the risk free rate used for the benchmark and choice of the period needs to be justified.</p> | | <p>indicate units, month and year. The documents have been provided to DNV during the site visit.</p> <p>4.The calculation of Banked energy is based on monthly generation data provided by Suzlon and Vestas and expected monthly electricity consumption. These documents have been provided to DNV during the site visit. The detailed calculation sheet is enclosed in the financial model.</p> <p>5. <u>Appropriateness of the benchmark</u> The benchmark of this project is the cost of equity¹ as there is no debt involved. This is in accordance with the accordance with the Guidance to investment analysis issued in EB 41 (paragraph 11) as per which the cost of equity can be considered as appropriate benchmark for equity IRR.</p> <p>The cost of equity has been determined using the Capital Asset Pricing Model (CAPM) considering Beta values of all listed power generating companies in India. The CAPM economic model is widely used to determine the</p> | <p>The banked energy calculations are OK.</p> <p>The data with respect to risk free premium, in the market have been verified with the source mentioned.</p> <p>The bench mark calculations have been revised to the proposal date from the project start date.</p> |

| Draft report clarifications and corrective action requests by validation team | Ref. to checklist question in table 2 and 2b | Summary of project owner response | Validation team conclusion |
|---|--|--|--|
| | | <p>required/expected return on equity based on potential risk of an investment. The CAPM framework is the Nobel award winning work of financial economist Dr. William Sharpe. In line with the requirements of the Guidance to Investment Analysis (paragraph 12), data and parameters used in calculation of cost of equity i.e. beta values of power generating companies in India, risk free rate of return, market risk premium etc. have been derived from publicly available data sources. The risk free rate data has been taken from RBI² and the market risk premium have been derived from BSE Sensex.</p> <p>The detailed calculations of cost of equity along with an elaboration of the approach are provided in the PDD.</p> <p><u>Choice of risk free return</u> The risk free rate is understood as the rate of return on an asset that is theoretically free of any risks, therefore the rate of interest on government bonds are considered as risk free rates. Page 188 of text book</p> | <p>Screen shots of the beta value taken is provided.</p> |

| Draft report clarifications and corrective action requests by validation team | Ref. to checklist question in table 2 and 2b | Summary of project owner response | Validation team conclusion |
|---|--|---|---|
| | | <p>on “Corporate Finance Theory and Practice” by Dr. Swath Damodaran³, Stern School of Business, New York University (attached as Appendix 1 in the PDD), describes that the long term government bond rates are suitable indicators of risk free rates when the time horizon for the investment is long term.</p> <p>The risk free rate is applicable value of government bond rate existing at the time of investment decision. As the investment decision date is March 2008, the data for 2006-07 has been used.</p> <p><u>Choice of period</u> The cost of equity is $Ke = Rf + B \times (Rm - Rf)$ where: Ke = Rate of return on equity capital; Rf = Risk-free rate of return; B = Beta; Rm – Rf = Market risk premium; The Market risk premium has been calculated as the difference in compounded annual return between the BSE-Sensex and the Government bond rates since the year of inception of</p> | <p>The choice of the risk free data period is verified and found to be appropriate.</p> |

| Draft report clarifications and corrective action requests by validation team | Ref. to checklist question in table 2 and 2b | Summary of project owner response | Validation team conclusion |
|---|--|---|---|
| <p>6) The compliance of the beta values working needs to be clarified in line with the clause 14 of annex 45 of EB 41 and it needs to be confirmed whether all companies with similar risk profile have been considered while calculating the beta. The supporting evidence for the beta values taken to be provided.</p> | | <p>BSE Sensex, i.e. 1979 – 80. The compounded annual return on government bond rates, average risk free rate, has been calculated from 1979 so as to keep the base year same as that of the BSE Sensex.</p> <p>6. Beta represents the market risk for an asset and is calculated as the statistical measure of volatility of a specific asset/investment relative to the movement of a market group.</p> <p>The project activity type is wind power generation; the approach therefore should be to base the beta for the project on the beta values of listed wind power generation companies in India. However, there is no company purely into wind energy business listed on any stock exchange in India (both BSE- Bombay Stock Exchange and NSE-National Stock Exchange) in year 2008. Therefore, in the absence of adequate data on companies which are exclusively into the exactly same type of business (i.e. wind power projects), the next best option for assessing the risk of these projects is to consider the data available on companies which are involved in similar businesses i.e</p> | <p>Screen shots of the beta values considered are provided in the revised PDD. The source reference has been mentioned.</p> <p>CAR is closed.</p> |

| Draft report clarifications and corrective action requests by validation team | Ref. to checklist question in table 2 and 2b | Summary of project owner response | Validation team conclusion |
|---|--|--|----------------------------|
| | | <p>Power Sector.</p> <p>Therefore, we have considered beta values of all electricity generating companies in India. The group of companies considered includes renewable as well as conventional power generating companies. It is understood that risky businesses are likely to have higher cost of equity than safer businesses; projects in riskier businesses will have to cover these higher costs. Hence, investors demand a higher return from renewable energy projects than from conventional energy ones, given the higher risks in renewable, including risks of technology, risks from significantly varying and unpredictable resource availability (e.g. wind), and a lower established support base for such projects relative to that for conventional power (e.g. grid connections, bank finance, suppliers, etc.). The use of this Beta value is therefore considered conservative, as it does not add for the higher risk of non conventional energy. Therefore we have considered unlevered Beta values of all power generating companies in India which were listed on the stock</p> | |

| Draft report clarifications and corrective action requests by validation team | Ref. to checklist question in table 2 and 2b | Summary of project owner response | Validation team conclusion |
|---|--|--|---|
| <p>7) The parameters used for working the sensitivity analysis does not confirm with the guidance for investment analysis of Annex 45, EB 41. Also, it needs to be indicated that</p> | | <p>exchange at the time of this investment. The screenshots are enclosed as Appendix 3 in the PDD.</p> <p>7.The parameters according to Annex 45, EB 41 for sensitivity analysis should be the total project cost, tariff and PLF. As O&M constitutes only 2.04% of the total project cost, it has not been considered (Annex 45, EB 41 mentions parameters that are more than 20%of total project cost or revenue). Sensitivity has been carried on the PLF. Sensitivity on capital cost and tariff has not been considered because of the following reasons.</p> <p><u>Capital Cost</u> We would like to submit that the capital cost considered for IRR calculations is the final negotiated value agreed with the WEG suppliers. The WEGs EPC contracts are fixed price contract and are not subject to any variations. Therefore any subsequent variation in capital cost is unlikely and hence sensitivity on capital cost has not been carried out.</p> | <p>The sensitivity analysis have been carried out for the main parameters namely PLF, capital cost and O&M. for plus minus 10 % variation. It is seen that the benchmark is not exceeded in any of the cases.</p> |

| Draft report clarifications and corrective action requests by validation team | Ref. to checklist question in table 2 and 2b | Summary of project owner response | Validation team conclusion |
|--|--|--|----------------------------|
| <p>at which point the variable taken for sensitivity analysis crosses the benchmark.</p> | | <p><u>HT Tariff</u> The tariff in Tamil Nadu has remained unaffected since 2000 at Rs. 3.5 per unit. The HT tariff for industrial consumers is set at a higher rate than the cost of supply because of loading of cross subsidy charges. (http://tnerc.tn.nic.in/orders/TRANSMISSION%20CHARGES%20TP1-Final.pdf Page no. 7) This cross subsidy is then used to subsidize tariff for agricultural consumers. The Electricity Act has mandated a progressive removal of cross subsidy charges and tariff setting purely on cost of supply. The Indian Electricity Act section 61(g) states "tariff should be set such that it progressively reflects the cost of supply of electricity and also reduces and eliminates cross-subsidy". This very clearly spells out a progressive reduction in HT tariff in coming years. Needless to say However in order to be conservative we have considered the current year tariff to be applicable for the next 20 years.</p> | |

| Draft report clarifications and corrective action requests by validation team | Ref. to checklist question in table 2 and 2b | Summary of project owner response | Validation team conclusion |
|---|--|---|----------------------------|
| | | <p style="text-align: center;"><u>Point at which the variable taken for sensitivity analysis crosses the benchmark</u></p> <p>As discussed above, the only variable factor that can have a material impact on the project's financials is the PLF. In line with the guidance we have calculated the PLF value at which the IRR crosses the benchmark.</p> <p>The Equity IRR crosses the benchmark at 43.4% PLF. We would like to bring to your notice that in order to be conservative the project proponent has considered the highest value of three PLF estimates available as the base PLF financial calculations. Therefore any further increase in generation is unlikely. Moreover the threshold PLF (43.4%) would mean more than 40% increase in generation, clearly this cannot be possible.</p> <p>8.IRR with CDM revenues at base PLF of 31.57% is 17.6% (Assuming CER price 20 Euro and conversion rate of</p> | |

| Draft report clarifications and corrective action requests by validation team | Ref. to checklist question in table 2 and 2b | Summary of project owner response | Validation team conclusion |
|---|--|---|----------------------------|
| <p>8) ITC to detail the calculation of IRR with CDM revenues and to confirm that treatment of tax and depreciation in the IRR calculation is as per S.No 5 of EB 41 Annex 45 the guidance for investment analysis</p> | | <p>Rs.66/Euro valid around July, 2008)</p> <p>The tax and depreciation in the IRR calculation has been carried out in accordance with S. No 5 of EB 41 Annex 45. (Book depreciation has been added back for tax and IRR calculation).</p> <p>9.Captive consumption has been estimated based on the actual in plant electricity consumption prior to the date of investment decision. The trends in energy consumption, from the energy bills show that the consumption has always been less than 29 lac units per month. However in order to be conservative 29 lac units have been assumed as captive consumption. We would like to mention that the captive consumption has remained unchanged after the project implementation.</p> <p>The bills and generations from WEGs are being provided to DNV.</p> <p>ITC Comments 19th June 2009.</p> <p>The clarification on the gross and net generation estimate, as mentioned in the</p> | |

| Draft report clarifications and corrective action requests by validation team | Ref. to checklist question in table 2 and 2b | Summary of project owner response | Validation team conclusion |
|---|--|--|---|
| <p>9) The tariff realised by ITC needs to be justified with the documents for the Maximum permissible load allowed at the consumption plant and the electricity bills of the packaging unit for the period December 07 to March 08 and from September 09 to April 09 needs to be provided. The bills for generation from WEG since commissioning to April 09 are to be provided</p> <p>DNV comments 16 June 2009</p> <p>a) The PLF achieved by Suzlon machine sin the present project site is 30.14%</p> <p>b) As per the purchase order placed on Suzlon (page 3 of agreement dated 10 July 2008) the estimated annual average power generation at the WTG controller at 100% grid availability and 95% machine availability is 43.5 lacs units.</p> <p>As per the order placed on Vestas (page 4 of agreement dated 23 July 2008 clause 8.1)Vestas</p> | | <p>Purchase Order, from Vestas is being provided to DNV. Estimate of 52.98 lakh kWh doesn't include the factors of machine availability, grid availability, corrections for wind uncertainty and uncertainty in modeling.</p> <p>The PLF has been calculated taking into account all the correction factors that were omitted in the generation estimates by Suzlon and Vestas. Generation estimates provided by the WEG suppliers in the Purchase Orders adjusted for the following: (based on TNERC order dated 18/05/2006)-</p> <p style="padding-left: 40px;">Suzlon</p> <ul style="list-style-type: none"> • 95% grid availability • 2% line losses <p>• 95% machine availability (already included in the Purchase Order)</p> <p style="padding-left: 40px;">Vestas</p> <ul style="list-style-type: none"> • 95% grid availability • 2% line losses • 95% machine availability <p style="padding-left: 40px;">The PLF works out to 31.57%.</p> | <p>The tariff considered has been verified with the electricity bills and found OK.</p> |

| Draft report clarifications and corrective action requests by validation team | Ref. to checklist question in table 2 and 2b | Summary of project owner response | Validation team conclusion |
|---|--|---|----------------------------|
| <p>explains that the estimated average annual generation (Gross) per Turbine in the Wind Park at Local Control System (LCS) is 52.98 Lakh kWh per WTG corrected to Park Efficiency and Air Density. It further states in clause 8.2 that Vestas explains that the estimated annual average generation for the WTG has been arrived at by applying following correction factors to the estimated gross generation referred to in Clause 8.1 above:</p> <ul style="list-style-type: none"> a) Machine Availability - 95% (Guaranteed as per Clause / Annexure J of Maintenance, Service and Availability Agreement) b) Grid availability - 93% to 98% (Assuming 2% to 7% grid drop and not guaranteed by VESTAS) c) Corrections for losses due to long term uncertainty of wind - 5% to 10% (Assumed and not guaranteed by VESTAS) d) Uncertainty in the modeling - 5% Assumed and not guaranteed by VESTAS) e) Line losses (generally varying from 2% to 4%) from WTG to the metering point have not been taken into account while arriving at the above figure. <p>The PLF based on purchase order may be reworked on the above basis.</p> | | <p>The banked energy calculation and energy calculation sheets have been updated with month, year and units.</p> <p>The benchmark has been calculated for March, 2008. The beta values have been unlevered to represent 100% equity.</p> <p>All the listed power generating companies are included in beta calculation.</p> | |

| Draft report clarifications and corrective action requests by validation team | Ref. to checklist question in table 2 and 2b | Summary of project owner response | Validation team conclusion |
|---|--|-----------------------------------|--|
| <p>Based on the revised PLF, the IRR any be recalculated.</p> <p>3. The units, month and year may be indicated alongwith source reference for the banked energy calculation and the Tiruvattyur bill sheets.</p> <p>5. The project proposal is in March</p> | | | <p>The excel sheet has been revised indicating the units .</p> <p>The bench mark comparison has been</p> |

| Draft report clarifications and corrective action requests by validation team | Ref. to checklist question in table 2 and 2b | Summary of project owner response | Validation team conclusion |
|---|--|--|---|
| <p>2008. Hence the benchmark comparison may be made with reference to this period.</p> <p>The beta component of the companies has both debt and equity. Since the project activity is fully equity based, beta may be appropriately corrected to account for this.</p> <p>May also confirm that all companies in power generation have been considered in the beta calculation.</p> | | | <p>revised from the start date to the project proposal date which is appropriate.</p> |
| <p>CL-1 ITC to detail in section B2 of the PDD as to how the project meets the eligibility requirements of a small scale category.</p> | A.5.1 | Section B.2 in the PDD has been revised to include the applicability criteria of AMS I.D | <p>OK.</p> <p>The CL is closed.</p> |
| <p>CL-2 The inconsistency in the Baseline emission factor working provided in the PDD with CEA data available at the time of PDD submission needs to be clarified.</p> | B.2.3 B.5.1 | The error in calculation has been corrected | <p>OK. The combined margin has been revised to 0.92718.</p> <p>The CL is closed.</p> |
| <p>CL-3 Real action to secure CDM revenues needs to be clearly provided with supporting evidences as per the Chronological sequence of events,</p> | B.3.4 | The chronological sequence of event table has been revised to include all the events that proves real action on the part of ITC Ltd to secure CDM revenues | <p>OK. The chronology of events do not indicate any inordinate delays and shows continuous action.</p> <p>The PDD has been revised to include the</p> |

| Draft report clarifications and corrective action requests by validation team | Ref. to checklist question in table 2 and 2b | Summary of project owner response | Validation team conclusion |
|---|--|--|--|
| starting from conceptualisation to commissioning of the project activity. | Table 2b A1.7 | | chronology of events. There is continuous action to obtain CDM status for the project activity. The CL is closed. |
| <p>CL 4The monitoring plan lacks clarity on the number of metering locations and connected with the project activity. The list of metering points with the specific location numbers of the WEGs need to be incorporated in the PDD.</p> <p>Also, the accuracy class of the meters needs to be included.</p> <p>DNV comments 16 June 2009</p> <p>This CL needs to be addressed</p> | <p>B.8.1 B.10.1 B.10.3 B.10.4 B.10.5 B.10.6 B.10.7 B.10.8 B.10.9 B.13.4 B.13.5</p> | <p>Metering is taking place right next to each WEG. This information has been incorporated in Annex 4 of the PDD.</p> <p>The accuracy class of meters has been incorporated in the revised PDD (Annex. 4)</p> | <p>OK.</p> <p>The CL is closed.</p> |
| <p>CL-5 The authority and responsibility of overall project management has not been formalised</p> <p>Procedures for (a) registration, monitoring, measurement and reporting of data (b) day to day handling, recording and archiving of energy generation data and (c) procedures to deal with erroneous readings have not been formalised. ITC to specify the measuring equipment employed & its appropriateness, measurement accuracy, measurement interval</p> | <p>B.8.2 B.13.1</p> | <p>The sections B.7.2 and Annex.4 has been revised to include-</p> <ol style="list-style-type: none"> 1. Authority and responsibility of overall project management 2. Registration, monitoring, measurement and reporting of data 3. Day to day handling of energy generation data 4. Procedure to deal with erroneous reading 5. Measuring equipment details with | <p>OK</p> <p>The CL is closed.</p> |

| Draft report clarifications and corrective action requests by validation team | Ref. to checklist question in table 2 and 2b | Summary of project owner response | Validation team conclusion |
|---|--|--|----------------------------|
| and how to deal with erroneous measurement. | | accuracy class 6.Measurement interval | |

APPENDIX B

CERTIFICATES OF COMPETENCE



CERTIFICATE OF COMPETENCE

Ramesh Ramachandran

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-8-1-CDMJI-i1)

| GHG Auditor: | Yes | | | | |
|---|--------------------------|-------------------------|--------------------------|-------------------------------|-------------------------------|
| Technical Area | CDM Validator | CDM Verifier | Sector Expert | Methodology Expert | Technical Reviewer |
| <i>Landfill gas</i> | Jan 2009 | Jan 2009 | Jan 2009 | | |
| <i>Hydro power</i> | Jan 2009 | Jan 2009 | | | |
| <i>Renewables</i> | Jan 2009 | Jan 2009 | | Jan 2009 | Jan 2009 |
| <i>Wind power</i> | Jan 2009 | Jan 2009 | | | |
| <i>Other renewable</i> | Jan 2009 | Jan 2009 | | | |
| <i>Biomass</i> | Jan 2009 | Jan 2009 | | | |
| <i>Grid connection of isolated system</i> | Jan 2009 | Jan 2009 | | | |
| <i>Cement</i> | Jan 2009 | Jan 2009 | | | |
| <i>Waste-heat / waste-gas recovery</i> | Jan 2009 | Jan 2009 | | | |
| <i>Efficiency of thermal power plants</i> | Jan 2009 | Jan 2009 | | | |
| <i>Coal mine methane</i> | Jan 2009 | Jan 2009 | | | |
| <i>Fuel switch</i> | Jan 2009 | Jan 2009 | | | |
| <i>Manure management</i> | Jan 2009 | Jan 2009 | | | |
| <i>Waste / wastewater treatment</i> | Jan 2009 | Jan 2009 | Jan 2009 | | |
| <i>Energy efficiency</i> | Jan 2009 | Jan 2009 | | | |
| <i>N₂O</i> | Jan 2009 | Jan 2009 | | | |
| <i>HFCs</i> | Jan 2009 | Jan 2009 | | | |
| <i>Flare reduction</i> | Jan 2009 | Jan 2009 | | | |
| <i>PFCs</i> | Jan 2009 | Jan 2009 | | | |
| <i>Charcoal</i> | Jan 2009 | Jan 2009 | | | |
| <i>CO₂ recovery</i> | Jan 2009 | Jan 2009 | | | |
| <i>Transport</i> | Jan 2009 | Jan 2009 | | | |
| <i>Non-renewable biomass</i> | Jan 2009 | Jan 2009 | | | |
| <i>Biofuel</i> | Jan 2009 | Jan 2009 | | | |
| <i>Pipeline leakage reduction</i> | Jan 2009 | Jan 2009 | | | |
| <i>SF₆</i> | Jan 2009 | Jan 2009 | | | |

Høvik, 9 January 2009

Michael Lehmann

Michael Lehmann

Technical Director, Climate Change Services



CERTIFICATE OF COMPETENCE

Murali Govindarajulu Kaliaperumal

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-8-1-CDMJI-i1)

| GHG Auditor: | Yes | | | | |
|---|--------------------------|-------------------------|--------------------------|-------------------------------|-------------------------------|
| Technical Area | CDM Validator | CDM Verifier | Sector Expert | Methodology Expert | Technical Reviewer |
| <i>Landfill gas</i> | | | | | |
| <i>Hydro power</i> | Aug 2009 | Aug 2009 | | | |
| <i>Renewables Wind power</i> | Jan 2009 | Jan 2009 | | | |
| <i>Other renewable</i> | | Sept 2009 | | | |
| <i>Biomass</i> | | | | | |
| <i>Grid connection of isolated system</i> | | Sept 2009 | | | |
| <i>Cement</i> | | | | | |
| <i>Waste-heat / waste-gas recovery</i> | | | | | |
| <i>Efficiency of thermal power plants</i> | | | | | |
| <i>Coal mine methane</i> | | | | | |
| <i>Fuel switch</i> | | | | | |
| <i>Manure management</i> | | | | | |
| <i>Waste / wastewater treatment</i> | | | | | |
| <i>Energy efficiency</i> | Jan 2009 | Sept 2009 | | | |
| <i>N₂O</i> | | | | | |
| <i>HFCs</i> | | | | | |
| <i>Flare reduction</i> | | | | | |
| <i>PFCs</i> | | | | | |
| <i>Charcoal</i> | | | | | |
| <i>CO₂ recovery</i> | | | | | |
| <i>Transport</i> | | | | | |
| <i>Non-renewable biomass</i> | | | | | |
| <i>Biofuel</i> | | | | | |
| <i>Pipeline leakage reduction</i> | | | | | |
| <i>SF₆</i> | | | | | |

Høvik, 8 September 2009

Michael Lehmann

Michael Lehmann

Technical Director, Climate Change Services



CERTIFICATE OF COMPETENCE

Ranganathan Seshan

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-9-8-i1-CDMJ1-i1)

| GHG Auditor: | Yes | | | | |
|---|--------------------------|-------------------------|--------------------------|-------------------------------|-------------------------------|
| Technical Area | CDM Validator | CDM Verifier | Sector Expert | Methodology Expert | Technical Reviewer |
| <i>Landfill gas</i> | | | | | |
| <i>Renewables</i> | | | | | |
| <i>Hydro power</i> | | | | | |
| <i>Wind power</i> | | | | | |
| <i>Other renewable</i> | | | | | |
| <i>Biomass</i> | | | | | |
| <i>Grid connection of isolated system</i> | | | | | |
| <i>Cement</i> | | | | | |
| <i>Waste-heat / waste-gas recovery</i> | | | | | |
| <i>Efficiency of thermal power plants</i> | | | | | |
| <i>Coal mine methane</i> | | | | | |
| <i>Fuel switch</i> | | | | | |
| <i>Manure management</i> | | | | | |
| <i>Waste / wastewater treatment</i> | | | | | |
| <i>Energy efficiency</i> | | | | | |
| <i>N₂O</i> | | | | | |
| <i>HFCs</i> | | | | | |
| <i>Flare reduction</i> | | | | | |
| <i>PFCs</i> | | | | | |
| <i>Charcoal</i> | | | | | |
| <i>CO₂ recovery</i> | | | | | |
| <i>Transport</i> | | | | | |
| <i>Non-renewable biomass</i> | | | | | |
| <i>Biofuel</i> | | | | | |
| <i>Pipeline leakage reduction</i> | | | | | |
| <i>SF₆</i> | | | | | |

Høvik, 1 December 2008

Michael Lehmann

Michael Lehmann