



## Voluntary Carbon Standard 2007.1 Final Validation Report

Report No: 53609908-08/672

Validation Report:

Name of Validation company:	Date of the issue:
TÜV NORD CERT GmbH	2009-11-18
Report Title:	Approved by:
“1.2 MW World Institute of Sustainable Energy Wind Farm in Karnataka”	Mr. Winter Rainer
Client:	Project Title:
Enercon India Limited on behalf of World Institute of Sustainable Energy	“1.2 MW World Institute of Sustainable Energy Wind Farm in Karnataka”
Summary:	

VCS 2007.1 Validation Report of the GHG emission reduction project entitled “1.2 MW World Institute of Sustainable Energy Wind Farm in Karnataka”

M/s Enercon India Limited on behalf of World Institute of Sustainable Energy (WISE), has commissioned the TÜV NORD JI/CDM Certification Program to carry out the validation of the project – “1.2 MW World Institute of Sustainable Energy Wind Farm in Karnataka”, with regard to the relevant requirements of VCS 2007.1 Standard as well as criteria for consistent project operations, monitoring and reporting.

The project activity generates electricity which will be supplied to the Southern Grid of India and then distributed to connected end users.

The review of the VCS PD and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and review of comments by parties, stakeholders have provided TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment of the stated criteria.

A risk based approach has been followed to perform this validation. In the course of the validation 5 Corrective Action Requests (CAR) and 6 Clarification Requests (CR) were raised and successfully closed out.

The validation is based on the VCS PD, proof of title, additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and supporting documents made available to the validators by project proponent.

As a result of the validation, the validators confirm that:

- The project additionality is sufficiently justified in the PD.
- The monitoring plan is transparent, adequate and inline with applied baseline and monitoring methodology of AMS.I.D Version 13.
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 25,950 t CO<sub>2</sub>e (total) is most likely to be achieved within the 10 years renewable crediting period which will be renewed once.

No restrictions or uncertainties were identified related to the validation.

Work carried out by:	Number of pages:
Mr. Ma Paa Puratchikkanal Mr. K V Sudarshan Ms. Manjari Chandra Ms. Sahana C.A	27

*[Table of Contents]*

1	Introduction.....	4
1.1	Objective .....	4
1.2	Scope and Criteria .....	4
1.3	VCS project Description .....	5
1.4	Level of assurance .....	5
2	Methodology .....	5
2.1	Review of Document.....	5
2.2	Follow-up Interviews .....	5
2.3	Resolution of any material discrepancy .....	6
3	Validation Findings.....	6
3.1	Project Design .....	7
3.2	Baseline .....	10
3.3	Monitoring Plan.....	21
3.4	Calculation of GHG Emissions .....	23
3.5	Environmental Impact .....	24
3.6	Comments by stakeholders.....	24
4	Validation conclusion .....	24
5	References.....	25

## 1 Introduction

### 1.1 Objective

The purpose of this validation is to have an independent third party assessment of the project design, in particular the project's baseline, the additionality, the monitoring plan (MP) and the project's compliance with

- The requirements of VCS 2007.1 program guidelines;
- Requirements of the CDM Approved methodology, AMS.I.D/ version 13, which is approved by VCSA;
- To assess the project's compliance with other relevant rules, including the project country (India) legislation and
- Other relevant rules, of VCS sustainability criteria are validated in order to confirm that the project design as documented is sound and reasonable and meet the stated requirements and identified criteria. Validation is seen as necessary to provide assurance to stakeholders on the quality of the project and its intended generation of Verified emission reductions (VERs/VCUs<sup>1</sup>) without any double counting.

### 1.2 Scope and Criteria

The validation scope is given as an independent and objective review of the project design, the project's baseline study and monitoring plan (based on AMS.I.D/ version 13 “Grid-connected electricity generation”) which are included in the VCS PD and other relevant supporting documents.

The items covered in the validation are described below:

- VCS 2007.1 & Project Country Criteria
  - To meet the requirements of VCS 2007.1 guidelines requirements, in particular,
  - Project country requirements / criteria
- VCS Project Description
  - Project design
  - Project boundaries and Predicted VCS project GHG emissions
- Project Baseline
  - Baseline methodology
  - Baseline GHG emissions
- Monitoring Plan
  - Monitoring methodology
  - Indicators/data to be monitored and reported
  - Roles and Responsibilities
- Project Additionality
- Background investigation and follow up interviews
- Draft validation reporting with CARs, CRs & FARs, if any
- Final validation reporting

The information included in the VCS PD<sup>PD4/</sup> and the supporting documents were reviewed against the requirements and criteria mentioned above. The TÜV NORD CERT GmbH JI/CDM CP has employed a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of VERs. The validation is based on the information made available to TÜV NORD JI/CDM CP and on the contract conditions.

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

---

<sup>1</sup> As per VCS, Verified Emission Reductions (VERs) are considered to be VCUs only after successful registration in an approved VCU Registry

### 1.3 VCS project Description

The project activity of World Institute of Sustainable Energy (WISE), the Project Participant (PP) is located in the Elladakere village in Chitradurga district, Karnataka, India. The project activity involves the installation of 2 wind mills of 0.6 MW capacity. The geographical coordinates of the windmills are 13° 49' 57.2" N latitude and 76° 30' 01.2" E longitude, and 13° 49' 54.3" N latitude and 76° 30' 01.5" E longitude respectively. The proposed project would generate energy from wind resources thereby displacing electricity generated using existing fossil fuel based power plants or future capacity additions in the State of Karnataka. Karnataka is a part of the country's Southern Grid.

The estimated electricity supplied to the grid from the project activity is 2.8 GWh per year. The estimated GHG emission reduction is 25,950 tCO<sub>2</sub>e for the chosen ten year crediting period.

### 1.4 Level of assurance

The validation report is based on VCS PD<sup>/PD1-PD4/</sup>, financial spreadsheet<sup>/XLS1 to XLS3/</sup>, supporting documents made available to the validation team and information collected through performing interviews and during the on-site assessment. The validation opinion is assured provided the credibility of all above.

## 2 Methodology

The validation of the project was carried from July till November 2009.

Preparations:	2009-07-20 to 2009-08-03
On-site validation:	2009-08-04
(Draft) Reporting:	2009-08-14
(Final) Reporting:	2008-11-18

The validation consisted of the following three phases:

- a desk review of the project design and the baseline and monitoring methodology
- follow-up interviews
- the resolution of outstanding issues and the issuance of the final validation report and opinion

### 2.1 Review of Document

The draft PD<sup>/PD1/</sup> submitted by WISE in June 2009 and supporting background documents related to the project design and baseline were reviewed in August 2009. Furthermore, the validation team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data.

The documents that were considered during the validation process are given in chapter 5 of this report. They are listed as follows:

- Documents provided by the project proponent (Table 5-1)
- Background investigation and assessment documents (Table 5-2)
- Websites used (Table 5-3).

### 2.2 Follow-up Interviews

On 2009-08-04, the TÜV NORD JI/CDM CP performed validation site visit with the project proponent in site Vani Vilas Sagar, Elladakere village, Chitradurga District, Karnataka.

During this visit, as well as earlier and after, interviews with the project proponent, the consultant, project stakeholders and with local authorities were carried out to confirm selected information and to resolve issues identified in the document review.

The key interviewee and main topics of the interviews are summarised in Table 2-1.

**Table 2-1** Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
1. Projects & Operations Personnel /IM01/  2. Consultants /IM02/	<ul style="list-style-type: none"> <li>- Desk review findings</li> <li>- General aspects of the project</li> <li>- Project design, Commissioning and implementation</li> <li>- Technical equipment and operation of the project</li> <li>- Performance of the project</li> <li>- Involved personnel and responsibilities</li> <li>- Training and practice of the operational personnel</li> <li>- Implementation of the monitoring plan</li> <li>- Monitoring and measurement equipment</li> <li>- QA/QC Testing and calibration procedures</li> <li>- Monitored data management</li> <li>- Data quality, archiving and reporting procedures</li> <li>- Data uncertainty and residual risks</li> <li>- GHG calculation</li> <li>- Procedural aspects of the verification</li> </ul>

A detailed list including the functions or designations of the interviewed persons is given in chapter 5 (see Table 5-4). This table also includes reference codes to be used in the validation protocol.

### 2.3 Resolution of any material discrepancy

A few discrepancies were found during the validation and the validation report containing a set of CARs & CRs were submitted to the project proponent. The project design document was revised addressing the CARs & CRs issued by TÜV NORD JI/CDM CP.

After reviewing the revised and resubmitted project document<sup>/PD4/</sup>, resolving the CARs & CRs raised and outstanding concerns, TÜV NORD JI/CDM CP issues this final validation report and opinion.

5 CARs and 6 CRs were found during Validation. Please refer to Section 3, table 3.

## 3 Validation Findings

The findings of validation are summarised in table 3:

**Table 3:** Summary of CAR, CR and FAR issued

Validation topic	No. of CAR	No. of FAR	No. of CR
------------------	------------	------------	-----------

Validation topic	No. of CAR	No. of FAR	No. of CR
D- Project Design	2	-	3
B- Baseline and additionality	2	-	2
M- Monitoring plan	1	-	-
C- Calculation of GHG emissions	-	-	1
E- Environmental Impact	-	-	-
L- Local Stakeholder Comments	-	-	-
<b>SUM</b>	<b>5</b>	<b>0</b>	<b>6</b>

For an in depth analysis/evaluation of all CARs and CRs can be referred to the below sections from 3.1 to 3.6.

### 3.1 Project Design

The proposed project utilizes wind power for electricity generation. Total installed capacity is 1.2 MW (2\*0.6 MW) with an estimated electricity supplied to the grid of about 2.8 GWh per year. This project is equipped with the Enercon model 0.6 MW WECs of make E-40 for power generation.

Supporting documents like purchase orders<sup>/PO/</sup> /TECH/ of the WECs were made available to the TÜV NORD JI/CDM CP. It was found that the purchase order<sup>/PO/</sup> issued by the suppliers of the WECs, Enercon India Limited specifies the technical details for the respective WEC. Information was also collected through performing interviews with the PP and during the on-site assessment.

Technical details and equipment specifications used in the project are as detailed below:

**Table 3-1:** Technical details of the wind turbines

Technical Specification of Enercon E-40/600 kW WEC	
Turbine Model	Enercon E-40
Rated Power	600 kW
Turbine type	Gearless horizontal axis wind turbine with variable rotor speed
No. of Rotor Blade	3
Rotor diameter	44 m
Orientation	Upwind
Design lifetime	20 years
Cut in wind speed	3.0 m/s

<b>Technical Specification of Enercon E-40/600 kW WEC</b>	
Rated wind speed	11.6 m/s
Rated Rotational speed	32.5 rpm
Hub Height	46 m
Output voltage	400 V
Generator	Synchronous generator

The project duration is: 20 years.

Start date of the project is 2004-11-05

Crediting period for the project activity: 2006-04-01 to 2016-04-30, renewable once.

The project proponent is World Institute of Sustainable Energy and has authorised Enercon India Limited to carry out baseline studies and all other carbon related activities and communication. The power is supplied to the Southern Grid by means of PPA. A copy of Power Purchase Agreements (PPA) signed between World Institute of Sustainable Energy and Karnataka Power Transmission Company Limited<sup>/PPA1/</sup> dated 2004-06-26 was submitted to the validation team.

The VER Authorisation Letter provided by the World Institute of Sustainable Energy (WISE) to Enercon (India) Limited and the purchase order placed on Enercon (India) Limited for the 2 x 0.6 MW capacity WECs are the proof of title submitted to DOE. Refer to Table 5-1.

The emission reduction has not been double counted. The project has not applied for carbon benefits under any other mechanism. There is no rejection history for the project activity.

However, CARs D1, D2 and CRs D1, D2 and D3 were raised and successfully closed out.



<b>CAR/CR</b>	<b>Reference</b>	<b>Summary of project owner response</b>	<b>Revised sections (as applicable)</b>	<b>Conclusion</b>
<p><b>CAR D1</b></p> <ul style="list-style-type: none"> <li>▪ There is no map representing the project boundary in section 1.5 of the PD. The coordinates of the WECs have been given in degrees and minutes only.</li> <li>▪ Location of the project varies in the PD and supporting documents. PPA mentions the village name as Ittegehalli, while the commissioning and calibration reports mention Elladakere. Clarify.</li> </ul>	<p>/PD 1/ /PD 2/ 1.5 /PPA1/</p>	<ul style="list-style-type: none"> <li>▪ Map representing the project boundary is been added in annexure I of the VCS PD. Project boundary coordinates are revised.</li> <li>▪ The commissioning certificate mentions the exact location where the machine is been installed, i.e. Elladakere village. But in case of PPA, there is mention of nearby villages where the wind farm is located. Necessary corrections are addressed in the VCS PD.</li> </ul>	<p>/PD 3/</p>	<p>Annex I contains the map depicting the project site location in Southern India. The project coordinates have been given in degrees, minutes and seconds. This has been verified and found to be OK. The project site is located at Village Elladakere as was confirmed during the site visit and supporting documents<sup>/CR/, /CAL/</sup>. Hence, CAR D1 is closed.</p>
<p><b>CAR D2</b> What is the basis for PLF of 26.64 %? Please provide reference in 1.9</p>	<p>/PD 1/ /PD 2/ 1.9</p>	<p>The PLF of 26.64 % is considered based on estimated generation details provided in the offer letter from Enercon India Limited to WISE dated 16 March 2004. The offer letter is submitted to the DOE for verification.</p>	<p>/PD 3/</p>	<p>The PP has chosen an estimated PLF of 26.64 % based on the financial proposal<sup>/PLF/</sup> or offer letter dated 2004-03-16 submitted to the PP by Enercon India Limited for 2 WECs of combined capacity of 1.2 MW. The offer mentions an estimated generation of 14 lakh kWh per year per WEC. Hence the chosen PLF of 26.64 % is acceptable. The offer letter was verified by the validation team and found</p>

VCS 2007.1 Validation Report of the GHG emission reduction project entitled “1.2 MW World Institute of Sustainable Energy Wind Farm in Karnataka”

<b>CAR/CR</b>	<b>Reference</b>	<b><i>Summary of project owner response</i></b>	<b><i>Revised sections (as applicable)</i></b>	<b>Conclusion</b>
				satisfactory. Hence, CAR D2 is closed.

<b>CAR/CR</b>	<b>Reference</b>	<b>Summary of project owner response</b>	<b>Revised sections (as applicable)</b>	<b>Conclusion</b>
<p><b>CR D1</b></p> <p>a) Editorial issues:</p> <ul style="list-style-type: none"> <li>▪ As per CEA carbon database version 4.0, it is no longer the Southern ‘Regional’ Grid.</li> <li>▪ Section 1.3 does not contain a table with the estimated emissions reductions</li> <li>▪ Section 2.2 mentions the total capacity as 4 MW.</li> <li>▪ NEWNE is mentioned as the connected grid in certain sections throughout the PD</li> </ul> <p>b) Please provide references/evidence for the following:</p> <ul style="list-style-type: none"> <li>▪ E 40 technology details in section 1.9</li> <li>▪ All published data used shall have URLs as footnotes</li> <li>▪ URL <a href="http://www.kerc.org/orders2003/Void%20PPAs-2.doc">http://www.kerc.org/orders2003/Void%20PPAs-2.doc</a> on pg 2 section 2.5 seems to be incorrect.</li> </ul>	<p>/PD 1/,/PD 2/</p>	<ul style="list-style-type: none"> <li>▪ The rectifications are made accordingly regarding Southern grid and not regional grid</li> <li>▪ Estimated emission reductions for the entire crediting period in the tabular form is incorporated in section 1.3 of the VCS PD</li> <li>▪ We regret the error. The rectification has been made in section 2.2 from 4 MW to 1.2 MW</li> <li>▪ The NEWNE is corrected to Southern Grid in VCS PD</li> <li>▪ The salient features of E-40 are included in the section 1.9 of VCS PD</li> <li>▪ Wherever URL references are available they are incorporated as footnote in the VCS PD</li> <li>▪ The incorrect URL has been removed from the references mentioned in the VCS PD</li> </ul>	<p>/PD 3/</p>	<p>The PD was checked in response to a) &amp; b) and found OK.</p> <p>a) The revised PD contains the rightly makes a reference to the Southern grid. Section 1.3 of the PD contains a tabular column representing the estimated emission reductions of 25,950. Other editorial errors have been corrected.</p> <p>b) The E 40 technology details have been included in section 1.9. and all references correctly cited in the revised PD.</p> <p>CR D1 is closed</p>

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
<b>CR D2</b>  Section 1.10 does not mention any applicable laws.	/PD 1/ 1.10	Clearance from the electrical inspectorate <sup>/ELEC/</sup> was obtained from the relevant authority and is provided for validation.	/PD 2/	The validation team has verified the Certificate from the Electrical Inspectorate <sup>/ELEC/</sup> from the Government of Karnataka dated 2004-11-02. Hence CR D2 is closed.
<b>CR D3</b>  The calculation with actual values in Section 4.0 is missing. This section shall include calculations to arrive at the emission factor specific to this project and not in general.	/PD 1/ 4.0	The Emission factor calculation for Southern Grid as per the CEA database version 4, is provided in the section 4.1 of the VCS PD	/PD 2/	The PD was verified in response to this clarification. The calculation given in the PD has been established with the emission factor derived from CEA Version 4.0 and is found to be satisfactory. CR D3 is closed.

### 3.2 Baseline

The proposed project adopts CDM approved methodology AMS.I.D./Version 13: Grid connected renewable electricity generation” which is approved under VCS 2007.1.

The project satisfies all criteria for AMS.I.D. The application of baseline methodology is assessed as correct. There is no methodology deviation or revision.

The project participant has used AMS-I.D./ version 13 approach to determine the emission coefficient of the Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories which states that the baseline scenario in case of installation of a new grid-connected renewable power plant/unit is “*is the kWh produced by the renewable energy generating unit multiplied by an emission coefficient (measured in kg CO<sub>2</sub>e/kWh) calculated in a transparent and conservative manner as (a)CM, consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the ‘Tool to calculate the emission factor for an electricity system’.*”

The selection of baseline scenario is assessed to be appropriate.

The project proponent has calculated the Simple Operating Margin (OM) for the Southern grid based on the latest three year statistics data (year of 2005-06, 2006-07, 2007-08) as per Central Electricity Authority guidelines version 4.0 October 2008 and the Operating Margin is 0.99815 tCO<sub>2</sub>/MWh, which is weighted average of the three year data. The value for Build Margin (BM) for 2007-2008 is directly used, i.e., 0.71331 tCO<sub>2</sub>/ MWh and a weightage factor of 75% & 25% is used for OM and BM to arrive at the Combined Margin value of 0.92694 tCO<sub>2</sub>/MWh.

The Combined Margin (weighted average of Simple Operating Margin and Build Margin) is estimated based on three years averages (2005-06, 2006-07 and 2007-08) of Simple Operating Margin and Build Margin which is in line with steps of “Tool to calculate the emission factor for an electricity system”. Both the values of Simple Operating Margin and Build Margin are selected under ex-ante approach. The grid boundary w.r.t the connected state grid is in Southern Grid of India.

The project proponent has used the published data of CEA, Version 4 October 2008 to calculate the Simple Operating Margin (OM). For wind and solar projects, “Tool to calculate the emission factor for an electricity system” allows the usage of the default weights which are as follows:  $w_{OM} = 0.75$  and  $w_{BM} = 0.25$ . Using the above values the combined margin emission factor is valued at 0.92694 tCO<sub>2</sub>/MWh.

The calculation of EF<sub>y</sub> is current and publicly available and published by the Central Electricity Authority on its web-site<sup>/ceal/</sup>. The validation team is convinced of the result of the emission coefficient calculation. It is deemed to be adequate, transparent and conservative.

The additionality has been assessed using project test. The implementation barrier, investment barrier, common practice approach & other barriers have been established to demonstrate the additionality.

Step as per VCS 2007.1	Argument	Assessment
Step 1: Regulatory Surplus	There is no legal or regulatory requirement for the project activity considered. Hence any enforced law, statute or other regulatory framework, cannot mandate the project.	<p>The validation team has checked all the National Regulations and Local legal requirements. It was found that there is no legal requisite in India and at the local level which mandates the implementation of wind power generating projects. Hence the argument is appropriate for this project activity.</p> <p><input checked="" type="checkbox"/> Step passed  <input type="checkbox"/> Step not passed  <input type="checkbox"/> Not applicable</p>
Step 2: Investment Barrier	<p>For carrying out the investment analysis, we have used data and assumptions available from various publicly available information sources. The discussions relating to key parameters i.e. appropriate financial indicators and tariff is set out below.</p> <ul style="list-style-type: none"> <li>▪ As per Guidance to investment analysis issued in EB 41 (paragraph 11), the weighted average cost of capital can be considered as appropriate benchmark for project IRR. The tool for demonstration and assessment of additionality [para-5, sub step 2(b)]</li> </ul>	<p>Investment Barrier:</p> <p>The PP has chosen to consider the cost of equity determined by the Weighted Average Capital Cost (WACC) by CAPM model. This is applicable as the Beta values used are those of electricity generating companies such as Reliance Energy, Gujarat Inds, Tata Power Company etc.</p> <ul style="list-style-type: none"> <li>▪ The cost of equity has been arrived at using Beta value<sup>2</sup>, yield rate<sup>3</sup> and market risk premium.</li> <li>▪ The interest prime lending rate of</li> </ul>

<sup>2</sup> Beta Snapshots

<sup>3</sup> <http://rbidocs.rbi.org.in/rdocs/Bulletin/DOCs/53569.doc>

Step as per VCS 2007.1	Argument	Assessment								
	<p>states that in such cases (where the project has more than one potential developer) the benchmark can not be based on internal cost of equity or WACC and shall be based on parameters that are standard in the market, considering the specific characteristics of the project type. Hence, we have not used company or project specific parameters for the calculation of the benchmark (such as company WACC, project and company specific interest rates, etc.).</p> <ul style="list-style-type: none"> <li>Accordingly, the weighted average cost of capital applicable to the project type has been considered. Weighted average cost of capital (WACC) is calculated as weighted average cost of equity and cost of debt as illustrated below</li> </ul> $WACC = [D / (D+E)] * [Cost of Debt] + [E / (D+E)] * [Cost of Equity]$ <p>The benchmark WACC for the project activity is chosen as 12.9%</p> <ul style="list-style-type: none"> <li>The Project IRR for the Project without Carbon revenues is 10.87 %, which is below the benchmark.</li> </ul> <p>Further, to show the robustness of financial analysis, sensitivity analysis is carried out as per the EB guidance on the ‘Assessment of Investment Analysis’, version-02, Annex-45, EB 41.</p> <p>The capital cost and O &amp; M costs are fixed as per the purchase order and actual O &amp; M contract, respectively. The PLF is the key variable encompassing variation in wind profile, variation in off-take (including grid availability) including machine downtime.</p> <p>On basis of estimated PLF of 26.64%</p> <table border="1" data-bbox="504 1704 1034 1962"> <thead> <tr> <th></th> <th>PLF @ 23.98%</th> <th>PLF @ 26.64%</th> <th>PLF @ 29.30%</th> </tr> </thead> <tbody> <tr> <td>Post tax Project IRR</td> <td>8.36%</td> <td>9.77%</td> <td>11.18%</td> </tr> </tbody> </table> <p>The sensitivity analysis clearly shows even</p>		PLF @ 23.98%	PLF @ 26.64%	PLF @ 29.30%	Post tax Project IRR	8.36%	9.77%	11.18%	<p>10.6 % has been arrived at by averaging PLR from RBI’s<sup>4</sup> <i>Cash Reserve Ratio And Interest Rates</i></p> <ul style="list-style-type: none"> <li>Using the cost of equity and PLR, the weighted average capital cost has been calculated and the benchmark of 12.9%<sup>/WACC/</sup> arrived at.</li> <li>The project IRR of 10.87 % has been established for the project activity for a lifetime of 20 years.</li> </ul> <p>Therefore, the above mentioned Project IRR for the 1.2 MW World Institute of Sustainable Energy Wind Farm of 10.87 % is below the chosen benchmark of 12.9%.</p> <p>Thus, the established investment analysis has been assessed to be appropriate and sufficient. The arguments with supporting spreadsheets<sup>/XLS4/,/WACC/</sup> provide proof for the non-viability of the project. The input data and assumptions for calculation of IRR like (profit after tax, project cost, net cash flow, additional depreciation, interest on term loan, applicability for taxation, insurance) are verified with references<sup>/PO, LSL, PPA, O&amp;M, COMM, INS/</sup> provided by PP and found to be correct. The considered benchmark is appropriate.</p> <p>The estimated annual electricity is based on the PLF of 26.64% which is considered. The PLF of 26.64%, is based on estimated generation information based on the financial proposal<sup>/PLF/</sup> offer letter dated 2004-03-16 submitted to the PP by Enercon India Limited for 2 WECs of combined capacity of 1.2 MW. The PLF @ 26.64% is an estimated generation of 14 lakh kWh per year per WEC. Hence the PLF of 26.64% considered for this project activity is found to be valid and is acceptable.</p> <p>The project revenue is sensitive to the electricity generation. Hence the sensitivity analysis has been carried out by the PP for the above variable.</p>
	PLF @ 23.98%	PLF @ 26.64%	PLF @ 29.30%							
Post tax Project IRR	8.36%	9.77%	11.18%							

<sup>4</sup> <http://rbidocs.rbi.org.in/rdocs/Wss/DOCs/53124.doc>

Step as per VCS 2007.1	Argument	Assessment
	<p>with a higher PLF, the project is not able to generate sufficient returns. The Post tax project IRR is below the benchmark IRR of 12.9 %. It can therefore be concluded that the project is financially not viable without VCU benefits.</p>	<p>The calculation has been reviewed and it is concluded that the project activity has IRR less than the benchmark value, clearly indicating that the project is financially not feasible without carbon benefits.</p> <p>The sensitivity analysis has also been provided for individual developers with increase in the generation to a tune of +/- 10% and it has been verified that the Project IRR does not cross the bench mark.</p> <p><input checked="" type="checkbox"/> Step passed  <input type="checkbox"/> Step not passed  <input type="checkbox"/> Not applicable</p>
<p>Step 3: Common Practice</p>	<p>We analyze the extent to which wind energy projects have diffused in the electricity sector in Karnataka. Installed capacity of wind in India is about 15%<sup>5</sup> of its potential. In Karnataka against an assessed wind potential of 6620 MW, the state currently has installed wind capacity of 847 MW as of 31 March 2007, which is about 12% of its potential.</p> <p>In 2006 the installed capacity of wind in Karnataka was around 600 MW, barely 8.5 % of its potential<sup>6</sup>.</p> <p>More than 75% of Karnataka’s wind capacity has been added in the last three years. It is interesting to note that during this period the regulatory framework for wind investments in Karnataka have reduced the tariff benefits to wind projects. We analyze the tariff that would be applicable to the project under the different regulatory policy regimes that have come up for wind power projects in Karnataka over the years.</p> <p>A more relevant common practice test is the amount of wind power generation as compared to the overall electricity generation availability for Karnataka. In 2004–05, wind electricity generation in Karnataka was 489.53 GWh<sup>7/CEA-REV1/</sup> and the total electricity availability at bus-bar in</p>	<p>From the analysis done on the Common Practice argument it is found that the scope of existing and upcoming wind energy projects of similar or higher scale is low compared to other energy sectors. The PP argues that the regulatory framework does not encourage wind energy development, as can be evidenced by low capacities as compared to other energy sectors. As a result of existence of the analysis of the barriers, the project activity has been concluded as not a common practice scenario in the region.</p> <p>OK</p> <p><input checked="" type="checkbox"/> Step passed  <input type="checkbox"/> Step not passed  <input type="checkbox"/> Not applicable</p>

<sup>5</sup> <http://www.indianwindpower.com/potential.html>

<sup>6</sup> [http://www.kredl.kar.nic.in/docs/Yearwise\\_allotment\\_and\\_commissioned\\_wind\\_power\\_projects.xls](http://www.kredl.kar.nic.in/docs/Yearwise_allotment_and_commissioned_wind_power_projects.xls)

<sup>7</sup> Table 3.4 titled “Gross Electrical Energy Generation (Utilities Only) Primemoverwise, Regionwise / Statewise During 2004-05” in chapter 3 of the CEA general review 2006 provided as annexure V

VCS 2007.1 Validation Report of the GHG emission reduction project entitled “1.2 MW World Institute of Sustainable Energy Wind Farm in Karnataka”

Step as per VCS 2007.1	Argument	Assessment
	<p>the state of Karnataka was 33,523.92 GWh<sup>8/CEA-REV2/</sup>. This works out to 1.45%, showing that wind energy generation is insignificant as compared to other power generation sources in Karnataka.</p> <p>Clearly, wind power project development in Karnataka is insignificant when compared to the power sector of Karnataka. Further, wind power project development is substantially dependent on VCS mechanism and thus is not common practice.</p>	

---

<sup>8</sup> Table 5.3 titled “Statewise System Losses During 2004-05” in chapter 5 of the CEA General review 2006 provided as Annexure VI



Thus the validation team arrived at the opinion that the project activity is assessed to be additional.

However, following CARs and CRs issues were raised and consequent upon the satisfactory response received from the project promoter, the issues have been closed out.

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
<p><b>CAR B1</b></p> <p>a) KERC Order provides for 2 months receivables as working capital, there is no provision for O&amp;M cost. Hence, providing for O&amp;M cost in working capital computation is not correct. Also provide evidence for O and M cost.</p> <p>b) Accounting for full 20 years operation would require extending the projections by one more year. Projection is presented for only 19 years and 4 months approx. Also number of operating hours in the first year should be 3528. This may be checked and corrected, if need be.</p> <p>c) The organisation is a trust. Is it taxable? In case it is,                      - project cost break up should be furnished and the depreciation</p>	<p>/PD 1/ 2.5 /XLS1/,/XLS2/</p>	<p>a) We would like to submit to DOE that a provision for O &amp; M cost is kept in advance by the project proponent which needs to be paid to the O &amp; M service provider. Since this would mean additional financial implications and same is considered in investment analysis.</p> <p>b) We agree with DOE’s observation and accordingly corrections have been made in revised financial calculation sheet. Complete 20 years period has been taken in account for projections. Number of hours has been correctly revised to 3528 hours.</p> <p>c)                      - Project cost break-up has been provided in revised financial calculation sheet. Depreciation has been provided on complete project cost. Since land is on lease and hence land cost is not included in project cost.</p>	<p>/PD 2/ /XLS3/</p>	<p>The O&amp;M contract<sup>/O&amp;M/</sup> between Enercon India Limited and World Institute of Sustainable Energy, the revised financial spreadsheet<sup>/XLS3/</sup> was checked in response to a), b), c) and d) and was found OK. The O&amp;M costs have been considered as per the contract, which is acceptable. The financial spreadsheet has been revised to include 21 years (March 2005 to March 2025). As the project activity is a business activity under 80IA ruling of the IT rules, depreciation, income tax and salvage value have</p>

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
<p>should be provided as per the rates given in Appendix I of IT Rules for various assets</p> <ul style="list-style-type: none"> <li>- Income tax computation does not appear to conform to IT Act and the ruling given for section 80IA</li> </ul> <p>d) Salvage value has not been included in the terminal year.</p>		<ul style="list-style-type: none"> <li>- We would like to clarify to DOE that WISE has installed the wind mills for research purpose which is as per the object of trust and therefore it is considered as business activity and subsequently. Since project is considered as business activity and it is eligible under 80IA ruling, tax computation has been revised accordingly</li> <li>d) 10% of project cost has been included as salvage value in the terminal year.</li> </ul>		<p>been included.</p>
<p><b>CAR B2</b></p> <p>The following clarifications with regard to the chosen benchmark are required:</p> <ul style="list-style-type: none"> <li>a) Use of interest rate as proxy for risk free return and the computation of average risk free return is not practical.</li> <li>b) Use of two Rfs in computing expected return on equity is not acceptable as it is not supported by CAPM</li> <li>c) The return interval used and the independent variable used in regression for computing Beta is</li> </ul>	<p>/PD 1/ 2.5 /XLS1/,/XLS2/</p>	<ul style="list-style-type: none"> <li>a) According to DOE’s observation corrections are made and now risk free rate is taken from Government Bond Yield rates.</li> <li>b) Correction has been made in the spreadsheet as per the DOE’s observation.</li> <li>c) The data pertaining to beta values has been sourced from Bloomberg.com which is one of the premier sites as far as financial</li> </ul>	<p>/PD 2/ /XLS3/</p>	<p>PD and financial spreadsheet has been verified in response to a), b),c) and d) and found to be OK. The yield rate has been taken from Govt. bonds from the RBI<sup>9</sup> and Beta snapshots<sup>/BETA/</sup> both of which were verified and found appropriate. Hence, CAR B2 is closed.</p>

<sup>9</sup> <http://rbidocs.rbi.org.in/rdocs/Bulletin/DOCs/53569.doc>

<b>CAR/CR</b>	<b>Reference</b>	<b>Summary of project owner response</b>	<b>Revised sections (as applicable)</b>	<b>Conclusion</b>
<p>not given and hence the appropriateness of beta for the project activity cannot be commented upon. Moreover, the screenshots have also not been furnished.</p> <p>d) Clarify if the arithmetic mean used for arriving at the industry beta is the conservative approach</p>		<p>information and data is concerned. The site and the beta values are being readily referred by project proponents for the purpose of calculating the benchmark worldwide. A number of CDM projects of recent origin which have considered Bloomberg screen shots for the purpose of calculation of benchmark have been registered by CDM –executive board. Since the screen shots are available in public domain hence we deem it appropriate for the purpose of computation of benchmark. Beta value is chosen for 3 year period, from the date of purchase order to past 3 years.</p> <p>d) For arriving at the appropriate beta values, higher weightage is given to companies that have a closer resemblance to the project activity or the business. In our case, all are power generating companies and therefore equal weight has been applied to arrive at the applicable beta value. Hence average value is considered.</p>		
<p><b>CR B1</b></p> <p>a) Under section 36A of The Bombay Public Trust Act, 1950, under which the society is said</p>	<p>/PD 1/ /XLS1/</p>	<p>a) We agree with DOE’s observation though we would like to clarify to DOE that wise has filed application under</p>	<p>/PD 2/ /XLS3/</p>	<p>Revised financial spreadsheet and relevant</p>

<b>CAR/CR</b>	<b>Reference</b>	<b>Summary of project owner response</b>	<b>Revised sections (as applicable)</b>	<b>Conclusion</b>
<p>to have been registered, trustees are not allowed to borrow. In the above background, it may be clarified whether the bank loan was taken for this project activity and whether necessary approval was obtained from the Charity Commissioner and with what conditions and limitations.</p> <p>b) Since it is a non-profit making organization established under The Bombay Trust Act, 1950, clarify whether the Trust provides for book depreciation at all and if so for what purpose</p> <p>c) MAT has been provided in the tax calculations. In case the organization is taxable, clarify whether MAT is applicable to this organization and if so under what</p>		<p>section 36A(3) of Bombay Public Trusts Act, 1950 seeking permission to raise loan from bank of Maharashtra and necessary approval was granted by the Charity Commissioner. Proof of same would be provided to DOE including terms and conditions.</p> <p>b) Though the WISE is registered under Bombay Public Trust Act, WISE is still eligible to provide book depreciation and WISE is doing it accordingly. To ensure this the audited accounts for financial year 2004-05, 2005-06, 2006-07 shall be provided to DOE for reference. Further, it may be noted that WISE has installed the wind mills for the purpose of research which is as per the objective of the trust and therefore it is considered as business activity and subsequently WISE can claim depreciation. The said perception is recognized by concerned authorities by accepting IT Returns.</p> <p>c) We agree to DOE's observation and accordingly MAT calculation is removed in revised financial calculation sheet since WISE is not eligible for MAT applicability.</p>		<p>documents was verified in response to a) b) and c) and found to be OK.</p> <p>The order document<sup>COM</sup><sub>M/</sub> from the Joint Charity Commissioner, Pune dated 2005-08-31 to WISE and audited balance sheets<sup>BAL/</sup> for the years 2004, 2005 and 2006 were verified and found OK.</p> <p>CR B3 is closed</p>

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
section of the IT Act.				
<b>CR B2</b> As per sec. 35 of The Bombay Public Trust Act, 1950, trusts are permitted to invest in select securities, which may not include shares. In the above background, clarify how far it is appropriate to compute ROE based on CAPM.	/PD 1/ /XLS1/	We agree with DOE that trusts are permitted to invest in select securities. However, the financial benchmark has to reflect broader sectoral picture and not an organization specific parameter. Since ROE is one of the most reliable indicators of expected returns from power generation (whether renewable or non renewable); hence it has been computed so as to ultimately compute weighted average cost of capital	/PD 2/ /XLS2/ /XLS3/	The validation team finds the response to the clarification satisfactory. The order from the Charity Commissioner /COMM/ of Pune permits the project to be scrutinized for financial viability. Hence CR B2 is closed.

### 3.3 Monitoring Plan

The proposed project uses CDM approved methodology AMS.I.D /Version 13: Grid connected renewable electricity generation, which is approved under VCS 2007.1.

The project satisfies all criteria for AMS.I.D. The application of monitoring methodology is assessed as correct.

The monitoring plan<sup>/PD4/</sup> provides detailed information related to the collection and archiving of all relevant data needed to:

- Estimate or measure emissions occurring from GHG sources, sinks and reservoirs
- Determine the baseline emissions
- Estimate changes in emissions from the site

The parameters to monitor are electricity exported to the grid, electricity imported from the grid and net electricity supplied to the grid.

The evacuation facility of the project activity to deliver the power to grid is maintained by the state utility (BESCOM).

In the project activity total electricity generated is being measured by energy meter, which is jointly monitored by the project participant and Bangalore Electricity Supply Company Limited (BESCOM). Thus the project conforms to the requirement of clause 13 of AMS-I.D.Version 13. The net electricity generated from the WECs in this project activity is calculated based on the difference of electricity exported to the grid and imported from the grid. The meter readings are recorded in B forms or joint meter readings<sup>/JMR/</sup> issued by Bangalore Electricity Supply Company Limited (BESCOM) every month.

The readings are taken at the point of supply of power to the grid at the BESCOM substation, hence the transmission and distribution losses and the minimum reactive power consumption has already been taken into account.

VCS 2007.1 Validation Report of the GHG emission reduction project entitled “1.2 MW World Institute of Sustainable Energy Wind Farm in Karnataka”

The on-site visit was carried out on 2009-08-04. One members of the Validation team attended the site visit.

Before and during the on-site visit the Validation team performed interviews with the project participants to confirm selected information and to resolve issues identified in the document review.

During the onsite-visit the information above was verified by the joint meter reading<sup>/JMR/</sup> reports which have been duly signed by the representatives of BESCOM submitted by the PP. This was found to be in line with the monitoring plan<sup>/PD4/</sup> & the PPAs<sup>/PPA1/PPA2/</sup> signed for the project and deemed to be ok.

The meters are calibrated at least once in a year by the BESCOM officials.

Responsibilities related to monitoring are clearly defined in the monitoring plan and were assessed and found to be OK.

However, following CARs & CRs were raised and successfully closed out.

<b>CAR/CR</b>	<b>Referenc e</b>	<b>Summary of project owner response</b>	<b>Revised sections (as applicable)</b>	<b>Conclusion</b>
<p><b>CAR M1</b> The following clarifications are with respect to the monitoring parameters and plan as per section 3.0 of the PD.</p> <p>a) Provide a brief explanation on the apportioning method.</p> <p>b) Include a schematic diagram with WECs, meters, pooling stations and sub stations in the PD. Name of substation is not mentioned.</p> <p>c) Mention whether meters are tri-vector etc....in section 3.0</p> <p>d) The parameter “EGy” has been repeated.</p>	<p>/PD 1/ 3.3 &amp; 3.4</p>	<p>a) Apportioning is as per the BESCOM issued monthly ‘B’ form, which gives import, export and transmission losses for individual customers, in this case WISE.</p> <p>b) The schematic diagram covering WECs, substation is included in the section 3.1 of the VCS PD.</p> <p>c) Meters are trivector L&amp;T make and all this information is been provided in the VCS PD</p> <p>d) Repeated EGy is rectified to EGexport, in the section 3.3 of the VCS PD</p>	<p>/PD 2/ &amp; /PD 3/</p>	<p>Corrections have been checked in response to points a), b), c), d) and e). The PD has been revised to include a schematic diagram of the project boundary in section 3.1 along with energy meter details. The monitoring plan has been elaborated to include appropriate and required QA/QC procedures. Hence, CAR M1 is closed.</p>

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
e) The monitoring plan shall be elaborated to include QA/QC. What about data archiving?		e) Monitoring Plan is elaborated in section 3.3 of the VCS PD. Data archiving is crediting period+ 2 yrs.		

### 3.4 Calculation of GHG Emissions

GHG emission reduction achieved by the project activity is calculated as the difference between the baseline emission and the project emission as well as the leakage emission. There are no GHG emissions arising from the project being a wind power project. Hence, the project emissions are zero. As the project activity does not involve power plant construction, fuel handling (extraction, processing, and transport), and land inundation, the leakage due to the project activity is not applicable as per AMS.I.D.

Following the AMS.I.D methodology, the combined margin (CM) methodology calculated ex-ante was chosen to calculate the baseline emission factor.

Baseline emission is equal to Net Electricity export by the project to the grid by the project activity ( $EG_y$ ) multiplied by the grid emission factor ( $EF_{grid,y}$ ). Also refer section 3.2.

The baseline emission factor is equal to the CM, which is applying the default weights are as follows:  $w_{OM} = 0.75$  and  $w_{BM} = 0.25$  for operating margin emission factor ( $EF_{OM,y}$ ) and the build margin emission factor ( $EF_{BM,y}$ ).

The calculation method of the OM and BM is derived from the guide of OM and BM calculation issued by CO<sub>2</sub> Baseline Database for the Indian Power Sector, User Guide (Version 4, Date: October, 2008) issued by CEA.

The validation team has checked the underlying input values as well as the computation in the emission reduction spreadsheet<sup>/ER2/</sup>. The estimation of the emission reduction was realized in a transparent and conservative manner and is well documented under section 4.2 - 4.4 of the PD.

As per the final PD<sup>/PD4/</sup> this project is expected to reduce emissions of 25,950 tCO<sub>2</sub>e over a 10 year crediting period.

Following CRs issues were raised and were subsequently closed out in view of the satisfactory response received from the project promoters:

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
<b>CR C1</b> <ul style="list-style-type: none"> <li>The calculation with actual values of OM, BM and</li> </ul>	/PD 1/ 4.0	The Emission factor calculation for Southern Grid as per the CEA database	/PD 2/ & /PD 3/	The calculation of emission

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
<p>CM in section 4.0 is missing. This section shall include calculations to arrive at EF specific to this project and not general.</p> <ul style="list-style-type: none"> <li>▪ The OM values shall be the weighted average of simple OM for the 3 recent years as given in the CEA carbon database version 4.0.</li> </ul>		<p>version 4, is provided in section 4.1 of the VCS PD</p>		<p>factor is correct. The values for OM, BM were verified and found to be as per CEA CO<sub>2</sub> database. Weighted average OM of the years 2005, 2006 and 2007 was used in the calculation of CM emission factor, and the same was revised in the PD. CRC1 is closed</p>

### 3.5 Environmental Impact

Wind projects of this scale do not require an Environment Impact Assessment study to be conducted as per existing laws. However, the PP assigned a third party to conduct Rapid EIA for the project activity. The results of the EIA study show that the noise levels and ambient air pollutant levels (suspended matter and oxides of Nitrogen and Sulphur) are within permissible limits. The project activity has negligible adverse impacts on the surrounding ecology.

### 3.6 Comments by stakeholders

A stakeholder consultation meeting of the project was conducted on 2006-09-02 at Arashinagundi Village, Chitradurga, Karnataka. The stakeholders meeting’s notification was published in the local daily Vijaya Karnataka-Namma Chitradurga on 2006-08-19. The stakeholders who attended the meeting included representatives from the nearby villages, WISE, Enercon India Limited, and Aditya Environmental Services. A summary of the stakeholder comments<sup>/SUMM/</sup> and minutes of meeting<sup>/MOM/</sup> have been included in the VCS PD. All comments were positive and it has been verified that all comments sufficiently have been addressed.

## 4 Validation conclusion

M/s Enercon India Limited on behalf of World Institute of Sustainable Energy has commissioned the TÜV NORD JI/CDM Certification Program to carry out the validation of the project – “1.2 MW World Institute of Sustainable Energy Wind Farm in Karnataka”, with regard to the relevant requirements of VCS 2007.1 Standard as well as criteria for consistent project operations, monitoring and reporting.



VCS 2007.1 Validation Report of the GHG emission reduction project entitled “1.2 MW World Institute of Sustainable Energy Wind Farm in Karnataka”

The project activity generates electricity from wind potential which will be supplied to the Southern grid of India and then distributed to connected end users.

The review of the VCS PD and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and review of comments by parties, stakeholders have provided TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment of the stated criteria.


A risk based approach has been followed to perform this validation. In the course of the validation 5 Corrective Action Requests (CAR) and 6 Clarification Requests (CR) were raised and successfully closed out.

The validation is based on the VCS PD, proof of title, additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and supporting documents made available to the validators by project proponent.

As a result of the validation, the validators confirm that:

- The project additionality is sufficiently justified in the PD.
- The monitoring plan is transparent, adequate and inline with applied baseline and monitoring methodology of AMS I.D Version13.
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 25,950 t CO<sub>2</sub>e (total) is most likely to be achieved within the 10 years renewable crediting period which will be renewed once.

No restrictions or uncertainties were identified related to the validation.



**Mr. Ma. Paa. Puratchikkanal**

Team Leader

Bangalore, 2009-09-23



**Rainer Winter**

Final approval

Essen, 2009-11-18

## 5 References

**Table 5-1:** Documents provided by the project proponent

Reference	Document
-----------	----------

VCS 2007.1 Validation Report of the GHG emission reduction project entitled “1.2 MW World Institute of Sustainable Energy Wind Farm in Karnataka”

<b>Reference</b>	<b>Document</b>
<b>/AUTH/</b>	Authorization letter from M/s.World Institute of Sustainable Energy authorizing M/s. Enercon India Limited to carry out all carbon related activities and communication’
<b>/BAL/</b>	Audited balance sheets of M/s World Institute of Sustainable Energy for the years 2004, 2005 and 2006
<b>/BETA/</b>	Beta snapshots from Bloomberg.com (March to Aug 2004)
<b>/CAL/</b>	Calibration report dated 2008-02-28 of the energy meters
<b>/CEA-REV1/</b>	“Gross Electrical Energy Generation (Utilities Only) Prime-over wise, Region wise / State-wise During 2004-05” in table3.4 chapter 3 of the CEA general review 2006 provided as annexure V to /PD3/
<b>/CEA-REV2/</b>	“State-wise System Losses During 2004-05” in table 5.3 chapter 5 of the CEA General review 2006 provided as Annexure VI to /PD3/
<b>/COMM/</b>	Order document from the Joint Charity Commissioner, Pune dated 2005-08-31 to M/s World Institute of Sustainable Energy
<b>/CR/</b>	Commissioning certificate (EEE/TL&SS/DVG/F-) of 2 Nos of 600 KW wind energy converters, dated 2004-11-05 at Elladakere village, Chitradurga issued by executive engineer, Karnataka Power Transmission Company Limited (KPTCL), Davanagere.
<b>/ELEC/</b>	Electrical Inspectorate certificate issued by the Chief Electrical Inspector, Government of Karnataka dated 2004-11-02
<b>/ER1/</b>	Emission reduction calculation sheet corresponding to VCS /PD1//PD2/
<b>/ER2/</b>	Emission reduction calculation sheet corresponding to VCS /PD3/ and /PD4/
<b>/JMR/</b>	Sample Joint meter reading reports for 2 x 600 kW issued by Bangalore Electricity Supply Company Limited (BESCOM)
<b>/MOM/</b>	Minutes of the stakeholder consultation meeting held on 2006-09-02
<b>/LSL/</b>	Loan sanction letter from Bank of Maharashtra to M/s.World Institute of Sustainable Energy
<b>/O&amp;M/</b>	Operation & Maintenance agreement for between M/s.World Institute of Sustainable Energy and M/s. Enercon India Limited for 2 Nos E-40 WEC dated 2005-07-04

<b>Reference</b>	<b>Document</b>
<b>/PD1/</b>	VCS PD for M/s World Institute of Sustainable Energy dated 2009-06-16, Version 1
<b>/PD2/</b>	VCS PD for M/s World Institute of Sustainable Energy dated 2009-09-02, Version 2
<b>/PD3/</b>	VCS PD for M/s World Institute of Sustainable Energy dated 2009-09-11, Version 3
<b>/PD4/</b>	VCS PD for M/s World Institute of Sustainable Energy dated 2009-11-17, Version 4
<b>/PLF/</b>	Financial proposal/offer letter dated 2004-03-16 submitted to M/s.World Institute of Sustainable Energy by Enercon India Limited for 2 WECs of combined capacity of 1.2 MW
<b>/PPA1/</b>	Power Purchase Agreements between Karnataka Power Transmission Company Limited (KPTCL) and M/s.World Institute of Sustainable Energy for the 2x600 kW dated 2004-06-24
<b>/PPA2/</b>	Power Purchase Agreements between Bangalore Electricity Supply Company Limited (BESCOM) and M/s. World Institute of Sustainable Energy for the 2x600 kW dated 2004-02-27
<b>/PO/</b>	Purchase orders from M/s. World Institute of Sustainable Energy to M/s. Enercon India Limited for 2 Nos E-40 WEC dated 2004-05-19
<b>/SUMM/</b>	Summary of the stakeholder comments from stakeholder meeting held on 2006-09-02
<b>/TECH/</b>	Technical specification of the WECs as given by Enercon India Limited
<b>/XLS1/</b>	Financial calculation sheet corresponding to VCS /PD1/
<b>/XLS2/</b>	Financial calculation sheet corresponding to VCS /PD2/
<b>/XLS3/</b>	Financial calculation sheet corresponding to VCS /PD3/ and /PD4/

**Table 5-2:** Background investigation and assessment documents

<b>Reference</b>	<b>Document</b>
<b>/AMS.ID/</b>	Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories (Version 13)
<b>/ACM 0002/</b>	Tool to calculate the emission factor for an electricity system (Version 01.1)
<b>/EB 41/</b>	Annex 45-Guidance to Investment Analysis

**Table 5-3: Websites used**

Reference	Link	Organisation
/vcs/	<a href="http://www.v-c-s.org">www.v-c-s.org</a>	VCS website
/unfccc/	<a href="http://www.unfccc.int">www.unfccc.int</a>	UNFCCC website
/cea/	<a href="http://www.cea.nic.in">www.cea.nic.in</a>	Central Electricity Authority
/rbi/	<a href="http://rbidocs.rbi.org.in/rdocs/Bulletin/DOCs/53569.doc">http://rbidocs.rbi.org.in/rdocs/Bulletin/DOCs/53569.doc</a>	Reserve Bank of India
/rbi/	<a href="http://rbidocs.rbi.org.in/rdocs/Wss/DOCs/53124.doc">http://rbidocs.rbi.org.in/rdocs/Wss/DOCs/53124.doc</a>	Reserve Bank of India
/capm/	<a href="http://www.investopedia.com/articles/06/CAPM.asp">http://www.investopedia.com/articles/06/CAPM.asp</a>	Investopedia
/srei/	<a href="http://www.kredl.kar.nic.in/docs/Yearwise_allotment_and_commissioned_wind_power_projects.xls">http://www.kredl.kar.nic.in/docs/Yearwise_allotment_and_commissioned_wind_power_projects.xls</a>	Karnataka Renewable Energy Development Limited
/satsig/	<a href="http://www.satsig.net/maps/lat-long-finder.htm">http://www.satsig.net/maps/lat-long-finder.htm</a>	Satellite Signal

**Table 5-4: Interviewed Persons**

Reference		Name	Organisation / Function
/IM01/	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Kharul	Head, M/s.World Institute of Sustainable Energy
/IM02/	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Himanshu Bhatnagar	Consultant, Enercon India Limited
/IM02/	<input type="checkbox"/> Mr. <input checked="" type="checkbox"/> Ms.	Sapna Padnekar	Consultant, Enercon India Limited