

VCS 2007.1 Validation Report of the GHG emission reduction project entitled "Bundled Wind Power project in Tamil Nadu managed by Enercon India Limited - II"



Voluntary Carbon Standard 2007.1
Final Validation Report

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Bundled Wind Power project in Tamil Nadu managed by Enercon India Limited - II	Eric Krupp
Client:	Project Title:
M/s Enercon (India) Limited	Bundled Wind Power project in Tamil Nadu managed by Enercon India Limited - II
Summary:	

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M/s Enercon (India) Limited has commissioned the TÜV NORD JI/CDM Certification Program to validate the project: "Bundled Wind Power project in Tamil Nadu managed by Enercon India Limited - II" with regard to the relevant requirements of the VCS 2007.1 Program Guidelines, as well as criteria for consistent project operations, monitoring and reporting.

The main purpose of the project activity is to generate fuel free carbon neutral electricity through sustainable means using wind power resources and use the state transmission grid (TNEB) for captive consumption, thereby displacing electricity of the Southern regional grid of India that would have been generated predominantly from fossil fuel based power generation.

A risk-based approach has been followed to perform this validation. In the course of the validation 10 Corrective Action Requests (CARs) and 1 Clarification request were raised which are successfully closed out and 01 FAR is raised which shall be checked during the verification.

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

In detail the conclusions can be summarised as follows:

- The project is in line with all relevant host country criteria (India) and all relevant VCS 2007.1 program guidelines requirements.
- The project additionality is sufficiently justified in the VCS PD.
- The monitoring plan is transparent and adequate and inline with applied baseline and monitoring methodology of ACM0002, version 10.
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 69,747t CO₂e/year is most likely to be achieved within the 10 years (fixed) crediting period.
- The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation.

No restrictions or uncertainties were identified related to the validation.

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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 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/VCUs¹) 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 (ACM0002 Version 10 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources") which are included in the VCS PD and other relevant supporting documents.

The items covered in the validation are described below:

- VCS 2007.1 & Host Country Criteria
 - To meet the requirements of VCS 2007.1 guidelines requirements, in particular,
 - Host country requirements / criteria
- VCS Project Description
 - Project design
 - Project boundaries and Predicted VCS project GHG emissions
- Project Baseline
 - Baseline methodology
 - Baseline GHG emissions

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

- Monitoring Plan
 - Monitoring methodology
 - Indicators/data to be monitored and reported
 - 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 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.

1.3 VCS project Description

The project activity involves installation and operation of 45 machines of E-48 type with a capacity of 800KW each which is totaling to the capacity of 36 MW. The project under consideration is located at Pushpathur site in Dindigull district and Chinnakkampalayam in Erode district of Tamil Nadu. The details of longitude and latitude have been furnished in VCS PD^{/VCS PD2/}.

The main purpose of the project activity is to generate fuel free carbon neutral electricity through sustainable means using wind power resources and use the state transmission grid (TNEB) for captive consumption , thereby displacing electricity of the Southern regional grid of India that would have been generated predominantly from fossil fuel based power generation.

The project considered harnessed renewable resources in the regions, thereby displacing non-renewable natural resources and thus ultimately leading to sustainable economic and environmental development in the region. The applied baseline methodology is ACM0002 Version10: "Consolidated baseline methodology for grid-

VCS 2007.1 Validation Report of the GHG emission reduction project entitled "Bundled Wind Power project in Tamil Nadu managed by Enercon India Limited - II" connected electricity generation from renewable sources". The estimated GHG reductions through the project activity are 69,747tCO₂e/year over the ten year fixed crediting period.

1.4 Level of assurance

The validation report is based on VCS PD^{/VCS PD1/VCS PD2/}, supporting documents made available to the validation team and information collected through performing interviews. The validation opinion is assured provided the credibility of all above.

2 Methodology

The Validation of the project activity has been carried out from November 2008 to November 2009

Preparations : 10/01/2009 to 15/01/2009

Site Visit : 25/02/2009

(Draft) Reporting : 18/03/2009

(Final) Reporting : 10/11/2009

The entire validation has consisted of the following three phases.

2.1 Review of Document

The draft VCS PD^{/VCS PD1/} submitted by the M/s Enercon (India) Limited in June 2009 and supporting background documents related to the project design and baseline were reviewed on 10/01/2009 to 12/01/2009. 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 25/02/2009 and 20/08/2009, TÜV NORD JI/CDM CP had meeting with EIL discussing the project details.

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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 interviewees are mentioned in table 5-4 of this validation report and the main topics of the interviews are summarized in below table:

Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
Project proponent representatives Project consultant	- Current status of plant design - Technical details of the project realization, project feasibility, designing, operational life time, monitoring of the project - Approval procedures and status - Monitoring and measurement equipment and system. - Financial aspects - Crediting period - Project activity starting date - VER allocation / ownership - Baseline study assumptions - Additionality - Sustainable development issues - Monitoring - Roles & responsibilities of the project participants w.r.t. project management, monitoring and reporting

2.3 Resolution of any material discrepancy

A few discrepancies were found during the validation process 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 documentation^{/VCS PD2/}; resolving the CARs & CRs raised and outstanding concerns, TÜV NORD JI/CDM CP issues this final validation report and opinion.

3. Validation Findings

The findings of validation are summarised in table 3-1:

Table 3-1: Summary of CAR, FAR and CR issued

Validation topic	No. of CAR	No. of FAR	No. of CR
D- Project Design	01	–	–
B- Baseline and additionality	05	01	01
M- Monitoring plan	02	–	–
C- Calculation of GHG emissions	01	–	–
E- Environmental Impact	–	–	–
L- Local Stakeholder Comments	01	–	–
SUM	10	01	01

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 conclusions regarding:

- The technology used: Installation consists of 45 machines of E-48 type with an individual machine capacity of 800 KW each and totaling to the capacity of 36 MW which located at Pushpathur site in Dindigull district and Chinnakkampalayam in Erode district of Tamil Nadu. The total capacity of the project activity is now 36 MW^{/VCS PD2/}. PP has provided initial VCS PD ^{/VCS PD1/} with the bundling capacity of 38.4 MW, however during the validation process one of the firm (TEXMO) has withdrawn from the bundle project activity and thus the project size is reduced to 36 MW^{/VCS PD2/} (Also Refer CARB.2(a)). Hence, the present project total capacity is 36 MW. The size of the individual project activity and technology implemented are cross checked with the Purchase order^{/PO/} and technical specifications^{/TS/} provided by the supplier respectively and are found OK.

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- Project duration :
 - o Project Life time: The technical project lifetime is 20 years^{/TS/}
 - o Crediting period: 10 years fixed crediting period; the start date of the crediting period is 01/04/2006.
 - o Project start date: 08/03/2006, the earliest commissioning date among the installations of WECs is taken as the start date of the project activity which is cross-checked with the commissioning certificate^{/CR/} and found OK. Also, this is the date for which project started the reduction of GHG emissions.
- Ownership
 - o Proof of title : EIL has provided the contract between the Project participant and EIL which endorses the project title ^{/PT/} which is found appropriate.
 - o The project is not participated and does not intends to participate in another emission trading program^{/RD/}. Hence no double counting applies for this project.
 - o This project is not rejected under other GHG programmes which was cross checked through the back ground investigation^{/unfccc/} as well the declaration given by the PP mentioning that project has not created any other environmental credits^{/RD/}.
 - o The project is eligible under the VCS 2007.1 standard^{/VCS STD/}

Nevertheless following CAR D1 was raised and closed successfully

Project Design	CAR D1			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	1. Section 1.2 of the VCS-PD should detail out whether the project is a group project activity. 2. Section 1.3 of the VCS-PD should			

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	detailed out under which project size the project activity falls (i.e. Micro projects, Projects and Mega projects) (Cp VCS2007.1 standard) 3. The start date as mentioned in the VCS-PD is not as per the VCS policy announcement dated 10th September 2008, correction is required. 4. PP should mention VCS project crediting period (i.e. Project can earn credit for a maximum of ten years which may be renewed atmost one/two times) in section 1.6 of the VCS-PD 5. Conditions prior to project initiation (i.e. Pre-project scenario) are not addressed properly in section 1.7 of VCS-PD. Also section 1.4 of the VCS PD says that the electricity generated from the project activity will be used for captive consumption. Why this is not included in 1.7. The baseline is not at all clear. Please explain in detail. 6. The description of products and services and the expected level of activity(i.e., electricity output covering project life time) are missing in section 1.9 of VSC-PD 7. Section 1.12 should be filled with proper justification in the VCS-PD. 8. Section 1.16 of the VCS-PD should be filled up covering all 11 points as mentioned in the relevant requirement of section 1.16(Cp VCS-PD template) 9. Section 1.17 should be filled up properly in the VCS-PD.
Corrective Action	1. The project is a bundled project activity having 6 investors. The

	details of the investors and schedule of activities are provided in the Annexure 2 and 3 of the PD. 2. The annual emission reductions that expected from the project activity are 69,747 and hence the project activity falls under projects category. Relevant text is included in the section of the PD. 3. Start date of the project activity in accordance with VCS policy announcement dated 10th September 2008 is "the date when project activity began reducing or removing GHG emissions". The project began reducing GHG emissions when the first machine included in the bundle was commissioned. Accordingly, start date is considered as 08/03/2006, being the date of commissioning of first turbine included in the Bundle. 4. The project proponent has chosen fixed crediting period. The first crediting period for the project activity is considered for the period of 10 years from 1 Apr 2006 to 31 March 2016. Same has been included in the revised PD. 5. The electricity generated from the wind power project will be wheeled for captive consumption. The electricity consumption at the industrial location will be replaced to the extent the wind power project generates electricity and will replace the electricity that would otherwise have been generated by other grid connected power stations and by addition of new generating stations. India has two regional grids i.e. NEWNE (North, Eastern, Western and North-Eastern) and Southern grid. The project is located in the southern region and hence the baseline for the project activity will be emissions that would have occurred by the operation of grid connected power stations and by the
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	addition of new generating stations. The above text is included in the PD section 1.7. The detail of the baseline calculation is provided in the section 4.1 of the PD. 6. The technical life of the project activity is 20 years and the project is expected to generate 75,244 MWh each year at the Plant Load Factor of 23.86%. Same has been included in the section 1.9 of the PD. 7. The project activity is primarily a renewable power generation facility which does not emit any kind of GHG emissions. Hence the project activity has not been implemented to create GHG emissions for the purpose of the subsequent removal or destruction of GHG emissions. The relevant text is incorporated in the revised VCS-PD. 8. All the 11 points that are required to be mentioned in section 1.16 are incorporated in the revised VSC-PD. 9. The documents that we have provided to the DoE do not contain commercially sensitive information. The same has been incorporated in section 1.17 of the revised VCS-PD.
DOE Assessment	VCS PD is revised against the issues raised in the CAR. Hence the CAR is closed.
Conclusion	☐ To be checked during the next periodic verification ☒ PD was corrected correspondingly ☐ Spread sheets were corrected correspondingly ☐ Appropriate action was not taken ☒ The project complies with the requirements

3.2 Baseline & Additionality

Baseline:

- The selected baseline methodology is ACM0002/Version10: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"
- There is no deviation of applicable methodology.

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- The selected baseline methodology, i.e., ACM0002/version 10 is correctly applied to this project activity. The baseline under the adopted methodology ACM0002/version 10 is calculated by multiplying the electricity baseline emission factor or grid emission factor (EF_y) and the net electricity exported to the NEWNE grid (EG_y). The grid emission factor (EF_y) is taken from CEA data base version 04 ^{/CEA/}. The grid boundary w.r.t the connected state grid is Southern Regional Grid of India. The combined margin of emission factors (CM) is taken as 0.9269 tCO_{2e}/GWh for Southern regional grid and will fixed ex-ante for the entire crediting period. The annual power generation from the project activity is estimated to be 75,244 MWh. The PLF is considered to be 23.86% which is assessed to be appropriate.
- Altogether the project activity reduces emissions of 69,747tCO_{2e}/year over the ten year fixed crediting period.

Nevertheless, CAR B1 and CAR B1.a had to be raised and were successfully closed.

Baseline & Additionality	CAR B1
Classification	☒ CAR ☐ FAR ☐ CR ☐ None
Findings	GHG sources, Sinks and reservoir for the baseline scenario and project should be incorporated under section 2.3.
Corrective Action	Correction has been made in revised VCS PD according to DOE observation.
DOE Assessment	The required correction is made in the PD. Hence the CAR is closed.
Conclusion	☐ To be checked during the next periodic verification ☒ PD was corrected correspondingly ☐ Spread sheets were corrected correspondingly ☒ Appropriate action was not taken ☐ The project complies with the requirements

Furthermore following CAR was raised as the validation progresses:

Baseline & Additionality	CAR B1.a
Classification	☒ CAR ☐ FAR ☐ CR ☐ None
Findings	The version of the Methodology is

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	revised by CDM EB from version 9 to version 10 during the course of validation. Hence, PP is requested to use the latest version of the applied Methodology and the relevant correction should be made in all the section of the VCS PD.
Corrective Action	The latest version of the Methodology is used and the relevant section of the VCS PD.
Additional Comment	The revised VCS PD ^{/VCS PD2/} found to be in line with ACM0002 version 10.
Conclusion	☐ To be checked during the next periodic verification ☒ VCS PD was corrected correspondingly ☐ Spread sheets were corrected correspondingly ☐ Appropriate action was not taken ☒ The project complies with the requirements

Demonstration and Assessment of additionality:

The additionality was demonstrated in PD according to the Additionality tool version 5.2 as required by the methodology ACM0002 Version 10 applied to the project activity.

The individual arguments presented in the VCS PD (section 2.5) to justify the additionality were summarised below. This table also includes the assessment of the validation team.

Step as per Additionality tool Version 05.2	Argument	Assessment
Step 1: Identification of alternatives to the project activity consistent with current laws and regulations	There are no legal and regulatory requirements for this particular technology for power generation The baseline alternative for the project activity is pre-defined in ACM0002 as generation of equivalent amount of electricity by operation of grid-connected power	Though there are no mandatory law or regulation which enforces project promoters to adopt the wind electricity generation; however the Verification team checked clearances obtained by PP from the regulatory body as explained under

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Step as per Additionality tool Version 05.2	Argument	Assessment
	plants and by addition of new generation sources. Accordingly, the realistic and credible alternatives to the project activity are: (a) The Project is not undertaken as a VCS project activity. (b) Equivalent amount of electricity being generated through operation of grid-connected power plants and addition of new generation sources	section 1.10 of revised PD. The most plausible baseline scenarios assessed to be the following: Alternatives (a) and (b) have been identified as realistic and credible alternative scenario(s) to the project activity. ☒ Step passed ☐ Step not passed ☐ Not applicable
Step 2: Implementation Barriers: Investment Barrier	The project/equity IRR with out VER revenue is not financially attractive compared to the WACC as a benchmark (minimum required rate of return) during the time of investment making process. The project/equity IRR with VER revenue enables to alleviate financially barrier of the project.	Project developer has demonstrated through the investment analysis that the financial returns of the project activity are insufficient to justify the investment. DOE has adopted a six-pronged strategy to ascertain the veracity of the conclusion drawn by the project developer, viz. a) determining the suitability of the benchmark applied for the type of financial indicator presented;

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Step as per Additionality tool Version 05.2	Argument	Assessment
		b) conducting an assessment of parameters and assumptions used in calculating the financial indicator and determining the accuracy and suitability of parameters; c) cross-checking the parameters against third-party or publicly available sources; d) assessing the correctness of computations carried out and documented; and e) Subjecting the critical assumptions of the project activity to reasonable variations to determine under what conditions variations in the result would occur, and the likelihood of these conditions. Suitability of financial indicator and benchmark: Since the project is a bundled wind power project which consist of sub projects, hence different benchmark

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Step as per Additionality tool Version 05.2	Argument	Assessment
		values computed to the respective projects depending upon the time of investment period. WACC benchmark has been chosen for the sub-projects which are funded more by debt portion in comparison to equity part to compare with project IRR. TUV is convinced of the appropriateness of the selected benchmark, the conservativeness thereof and its appropriateness for the project. Using the benchmark, the project developer has demonstrated that the expected return from the project activity is lower than WACC. The IRR values for individual PPs are described after the this table. ☒ Step passed ☐ Step not passed ☐ Not applicable
Step3: Barrier analysis	NA	NA

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Step as per Additionality tool Version 05.2	Argument	Assessment
Step 4: Common practice Analysis	Wind power project development is insignificant when compared to the total installed generating capacity of the power sector as well as in terms of realization of the total wind potential.	The statistics furnished by the PP as well as independently collected by TUV reveal that wind power projects are not business as usual in state of Tamil Nadu. ☒ Step passed ☐ Step not passed ☐ Not applicable

The individual arguments presented in the PD (section 2.5) to justify the additionality were summarised in table 3-2. This table also includes the assessment of the validation team. The individual values for IRR are as follows,

SI	Investor Name	Benchmark	Base Case
1	Premier Spg & Wvg Mills Pvt Ltd	13.68%	8.51%
2	Premier Fine Yarns Pvt Ltd	13.35%	8.67%
3	Coimbatore Twisted (Premier Mills)	13.68%	7.45%
4	Coimbatore Polytex (Premier Mills)	13.68%	8.54%
5	Bannari Amman Spinning Mills	11.89%	8.21%

The PP has used the approved methodology ACM0002: 'Grid connected renewable electricity generation' Version 10. The applicability of the chosen baseline methodology has been adequately discussed in the VCS PD /VCS PD2/. The project envisages generation of renewable energy using wind energy.

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The project scenario is considered additional in comparison to the baseline scenario (grid connected power) and therefore eligible to receive Voluntary Emission Reductions (VERs) under the VCS program.

The project meets the additionality requirement of large scale CDM project as part of applied meth (ACM0002) and thus correctly applied additionality tool for large scale project which is described below:

Identification of alternatives: The project developer has considered three alternatives for the project activity, viz.

- (a) The Project is not undertaken as a CDM project activity.
- (b) Equivalent amount of electricity being generated through operation of grid-connected power plants and addition of new generation sources

Having regard to the fact that the project activity under consideration is a wind power project, DOE is convinced that there are no other realistic and credible alternatives.

The alternatives are in compliance with all applicable legal and regulator requirements as

- The implementation of project activity is a voluntary initiative and is not mandatory or a legal requirement;
- The Electricity Act 2003 does not restrict or empower any authority to restrict the fuel choice for power generation;
- The applicable environmental regulations do not restrict the use of wind energy; and
- There is no legal requirement on the choice of a particular technology.

Alternative considered for further analysis are;

- (a) The Project is not undertaken as a CDM project activity.
- (b) Equivalent amount of electricity being generated through operation of grid-connected power plants and addition of new generation sources

However, alternative (i) cannot be considered realistic as further Investment analysis in the following paragraph reveals that it faces investment barriers.

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Hence, alternative (ii) alone could be justified as realistic, credible and plausible alternative to the PP. However, this alternative would result in higher GHG emissions.

The project is a large scale project. Hence, the Additionality Tool (Ver 05.2) applies to the project activity. Therefore, in accordance with ACM0002, the additionality was demonstrated based on the valid version of the "Tool for demonstration and assessment of additionality (Ver 05.2)".

The project activity generates revenue by selling electricity to the state electricity board (SEB) and/or saves the expenditures on electricity by making captive use of the generated power. Thus simple cost analysis cannot be applied to the proposed VCS project activity.

The baseline to the project activity is the grid electricity system. This alternative will not require capital investment. Hence, investment comparison analysis cannot be applied and benchmark analysis is most appropriate.

Internal rate of return (IRR) is one of the known financial indicators used by banks, financial institutions and project developers for making investment decision. Hence to conduct the investment analysis of the project activity the post tax project internal rate of return (IRR) is selected as the financial indicator.

The Validation Team is convinced that the project faces Investment barrier. Since the project is a bundled wind power project which consists of sub projects, hence different benchmark values are used for different sub projects depending upon the time of investment period. WACC benchmark has been chosen for the sub-projects which are funded more by debt portion in comparison to equity part to compare with project IRR.

As per the guidance to the investment analysis issued in EB41, the weighted average cost of capital (WACC) can be considered as appropriate benchmark for project IRR. WACC benchmark has been chosen for the sub-projects which are funded more by debt portion in comparison to equity part to compare with project IRR.

DOE checked the various inputs used in the calculation, correctness of various financial parameters used with the

VCS 2007.1 Validation Report of the GHG emission reduction project entitled “Bundled Wind Power project in Tamil Nadu managed by Enercon India Limited – II” documentary evidence^{/ADD/,/PO/,O&M/,/PPA/,/TS/} submitted by the PP and also based on its sectoral and local expertise^{/VVM/}. The calculations have been checked for arithmetical accuracy and the adoption of the accepted accounting principles. DOE verified the depreciation and tax rates used in the calculation. IRR computation conforms to the guidance given by the EB vide Annex 45 of EB 41.

The computations reveal that the project yields an IRR of lower than the benchmark of WACC. Since the project IRR is less than the benchmark, Validation Team has arrived at the conclusion that the project is additional.

Sensitivity Analysis

The robustness of this conclusion was checked by subjecting critical factors to reasonable variations. Three factors have been identified as critical, viz., PLF, and O&M cost.

The project even after having a PLF of 10% higher along with a reduction of 10% in O&M is still not able to cross the benchmark value. The PP has argued that both the scenarios are hypothetical and far from reality. Assessment team found that PP has failed to submit the documents according to annex 11, of EB 48. However, assessment team restricted the PLF by raising the FAR that if PLF exceeds the limits of sensitivity analysis, additionality has to be re-assessed in subsequent verification (Refer FARB1)

The details of the sensitivity analysis for PLF and O&M are presented below for further justification:

1 Plant load factor

Sensitivity Analysis of the project IRR to the Plant Load Factor has been carried out considering variation of + 10% in the generation. The sensitivity has been done on all the investors and is being presented in the table below.

SI	Investor Name	Benchmark	Base Case	10% increase in PLF
1	Premier Spg & Wvg Mills Pvt Ltd	13.68%	8.51%	10.36%

2	Premier Fine Yarns Pvt Ltd	13.35%	8.67%	10.53%
3	Coimbatore Twisted (Premier Mills)	13.68%	7.45%	9.21%
4	Coimbatore Polytex (Premier Mills)	13.68%	8.54%	10.25%
5	Bannari Amman Spinning Mills	11.89%	8.21%	10.10%

2. O & M Cost

Sensitivity Analysis of the project IRR to the O & M cost has been carried out considering variation of -10% in the cost of O & M. The sensitivity has been done on all the investors and is being presented in the table below

SI	Investor Name	Benchmark	Base Case	10% decrease O & M Cost
1	Premier Spg & Wvg Mills Pvt Ltd	13.68%	8.51%	8.90%
2	Premier Fine Yarns Pvt Ltd	13.35%	8.67%	9.22%
3	Coimbatore Twisted (Premier Mills)	13.68%	7.45%	7.83%
4	Coimbatore Polytex (Premier Mills)	13.68%	8.54%	8.94%
5	Bannari Amman Spinning Mills	11.89%	8.21%	8.56%

Common Practise Analysis: The statistics furnished by the PP as well as independently collected by DOE; reveal that wind power projects account for less than 10% of the total installed power generating capacity of the country as a whole and 4.7% of total electricity available to the state of Tamil Nadu. Though validation team is convinced that contention of PP that wind power projects are not common practice in Tamil Nadu, Considering the number of wind power projects being set up, DOE is of the opinion that common practice is a barrier to the project activity.

In the above background, the Validation Team is convinced that the project is not a business-as-usual-scenario and is additional. The VCS benefits would enable the project to overcome the investment barrier and hence, VCS benefits are imperative for the project activity and VCS revenue is must in this project activity to improve financial return up to some extent.

Nevertheless following CARB2- CARB5, CR B1 were raised and closed successfully during the validation. FAR1 has been raised and would be checked during all the periodic verifications.

Baseline & Additionality	CAR B2			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	Following discrepancies associated with Additionality are found: 1. PLF of 23.86% is not acceptable. It should be machinery supplier guaranteed generation or TNERC recommended PLF, whichever is higher 2. Though it matters little, the number of days in 2006-07 in the case of Premier Fine Yarns should be 25 as the windmills commenced generation on 07.03.2007; Coimbatore Twisted should be 18 days as it started on 14.03.2007; Bannari Amman Spinning should be 31 days as it commenced generation on 01.03.2007.			

	3. As the project has already commenced generation, insurance and O&M charges should be based on insurance premium paid and the O&M contract signed with the machinery supplier 4. Machinery suppliers provide atleast one year warranty for the windmills. In the above background accounting for O&M cost right from the first year is not acceptable 5. Since Premier Fine Yarns, Coimbatore Twisted and Bannari Amman Spinning commenced generation only in March, providing 5% escalation in the O&M charges for the entire year in 2007-08 is not acceptable as it results in providing escalation within a month. 6. The commencement date of generation of Bannari Amman Spinning Mills differs between worksheet and VCS PD. While it is 1.3.2007 in worksheet it is stated as 08.03.2006 in VCS PD. This also contradicts the statement made vide sec 1.6 (p. 6) of VCS PD as the start date is stated as 08.03.2006. Reconcile 7. Interest, loan repayment and repayment holiday should be based on loan sanction letter 8. Working capital and interest thereon are not acceptable as TNERC Order does not provide for the same 9. Though it does not affect additionality, providing full year depreciation when the WEGs were in operation for less than a year, is not in conformity with accepted accounting principles, more so when all other expenses have been
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	accounted for on pro rata basis.
Corrective Action	1. The project activity is located in the state of Tamilnadu and the plant load factor is taken from the Tamilnadu state electricity commission for the particular pass where the project activity is located. TNERC is a quasi-judicial body that is set up under regulatory commissions Act, 1998. The plant load factor is estimated by TNERC by taking to consideration the electricity generation of all the wind farms that are operating in the particular pass and has provided the plant load factor separately for each pass. The project activity is located in Palaghat Pass and Plant Load Factor advocated by TNERC for Palaghat pass is 23.86%. Therefore we have considered it appropriate to assume the PLF that is advocated by regulatory commission. Also, as TNERC takes to consideration WTGs of all the manufacturers and provides the PLF for the Palaghat pass that is based on the average of all the existing wind farm it very unlikely that the project activity will be able to generate PLF that is variation to the PLF advocated by the commission. However, it is very unlikely that the project will be able to generate PLF higher than 23.86% for the long term (over 20 years lifetime of the project activity), the sensitivity is carried out considering variation of +/- 10%. 2. The generation for the day on which machine was commissioned was excluded in the worksheet initially submitted to the DoE. We have made the changes to include generation of the day on which the machine was commissioned in the first FY. The revised worksheet has been provided to the DoE.

	3. As per investment guidance, the assumptions that are applicable at the time of the investment decision making shall be applied, therefore we have applied the values from the offer letter provided by the supplier. 4. As per investment guidance, the assumptions that are applicable at the time of the investment decision making shall be applied, therefore we have applied the values from the offer letter provided by the supplier. 5. The O&M cost has been adjusted to escalation in appropriate manner. The escalation is applied after completion of the first year in the revised worksheet. 6. The commission date for the Bannari Amman Spinning Mills is 8th March 2006. The typological error in the worksheet has been corrected. The project began reducing GHG emissions when the first machine included in the bundle was commissioned. Accordingly, start date is considered as 08/03/2006, being the date of commissioning of first turbine included in the Bundle. 7. As per investment guidance, the assumptions that are applicable at the time of the investment decision making shall be applied, therefore we have applied the values that are available to PP at the time of decision making. Interest cost is taken from the Prime lending Rate published by RBI that was available at the time of decision making. Please note that we have taken all the assumptions that are available at the time of decision making as per investment guidance tool. Accordingly we have applied 23.86% as PLF for the project activity that is higher than the actual PLF achieved by the project activity. Further, sensitivity is also
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	conducted on the assumed PLF which is lower than the PLF actually achieved at the project site. 8. Working capital is the financial metric that is required to operate the business. Interest on working capital is allowed as expense in financial workings. The operation and maintenance cost is payable in advance for each year to the O&M contractor. Therefore the business will require the working capital support for a year for O&M. The working capital interest is integral part of expenses in the financial working. Therefore we have considered it appropriate to include interest on working capital in the financial analysis. The assumptions are sourced from supplier's offer. 9. The expenses and depreciation are adjusted for in accordance with the accounting principles in the revised worksheet.
TUV Assessment	1. Justification is acceptable. 2. Working days has been corrected. CAR is closed 3. TUV is required to critically assess the presented evidence, using local knowledge and sectoral and financial expertise. Use of actual O&M and insurance provides an acceptable evidence for DOE to rely upon. Moreover, If the PP chooses to go by offer letter, justification is required why the sensitivity analysis of the parameters is not being carried out. 4. The explanation has no correlation to the worksheet. O&M cost has been provided from 2nd year. However, O&M cost has been provided for full year irrespective of the commencement date of generation. CAR is open 5. Escalation is provided right from 2nd year, which is not as per accepted accounting principle. CAR is open 6. OK 7. The companies included in the bundle

	are profit making companies and invariably get a discount on PLR. The argument is not acceptable. Moreover, see the conclusion to response (3) above. CAR is open 8. Response has no correlation to worksheet. Working capital interest has been eliminated, rather replaced by a new cost head called administrative expenses, which is not acceptable. CAR is open. 9. Depreciation has been provided pro rata. CAR is closed
Corrective Action #2	3. According to the DOE observation the sensitivity on the following parameters has also been included in the analysis (a) O&M Cost (b) O&M escalation and (c) No. of Days for which advance payment is to be made for O&M. We have used the project IRR which increases with increase in interest rate. As most the companies that are included in bundle are capable of demanding discount over PLR; the use of PLR for the purpose of investment analysis is conservative. 4. Adjustment to O&M cost has been done to represent the true state in revised working. 5. Adjustment to the O&M escalation has been done to represent the true state in revised working. 7. We would like to submit to DOE that we have used the project IRR and the increase in interest rate increases the project IRR owing to the fact that the project will get more rebate on tax as interest on debt is tax deductible. Therefore it is conservative use PLR instead of discount adjusted value of PLR. 8. We would like to submit to DOE that while the TNERC order is a reference point it cannot be the basis for our investment decision. Under the terms of our arrangement with Enercon, we are required to pay O&M expenses in advance and also the adjustment of the generation is deferred by a

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	billing cycle from the actual generation. Therefore the business will require the working capital support for O&M. The DOE would agree that these factors impose additional financial burden on the project and hence need to be considered for Investment Analysis. We have removed receivables and administrative expenses from revised financial working. Sensitivity analysis has also been done on O & M advance in revised VCS PD.
DOE Assessment#2	Justification and corrections made against the all issues in the CAR are acceptable. Hence the CAR is closed.
Conclusion	☐ To be checked during the next periodic verification ☐ PD was corrected correspondingly ☒ Spread sheets were corrected correspondingly ☐ Appropriate action was not taken ☒ The project complies with the requirements

Baseline & Additionality	CAR B2.a			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	The following parameters has been changed in the revised worksheet submitted a) TEXMO has been removed in the revised submission; b) interest rate on term loan has been hiked barring one project; c) insurance premium has been brought down from 0.75% to 0.18% d) O&M cost has been increased from 1.10% to 1.87% e) escalation in O&M cost has been increased from 5 to 6% f) loan moratorium has been removed; g) a new item called banking charges has been introduced at 5%; h) a new item called administration expenses has been included; i) While receivables has been removed from the working capital, stock of			

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	O&M cost has been increased from 30 to 365 days. 1. Furnish relevant sections of IT Act or rulings given if any, which prohibit capitalization of erection and commissioning charges for depreciation 2. "The projection does not take into account interest subsidy made available by the Ministry of Textiles under TUFS".
Corrective Action	1. Following corrections has been made:- a) We would like to submit to DOE that TEXMO has withdrawn from VCS project activity that's why TEXMO was removed from revised submission. b) Interest rate has been taken from the Prime Lending Rates published by RBI available at the time of investment decision. We would like to clarify that we are using project IRR as a financial indicator that increases with increase in interest rate; hence use of PLR is a conservative approach. c) We would like to submit to DOE that insurance amount of 0.18% has been taken on normative basis used industry. d) We would like to submit to DOE that the O&M cost has been taken from the supplier's offer as the assumptions that are taken in the analysis should be derived from the information that is available to the owner at the time of investment decision (as per investment guidance). However, we have included the sensitivity on the O&M cost at the reasonable variation to present the robustness of the financial model. e) The O&M escalation has been taken from the supplier's offer as the assumptions that are taken in the analysis should be derived from the information that is available to the owner at the time of investment decision (as per investment guidance). However, we have included

	the sensitivity on the O&M escalation at the reasonable variation to present the robustness of the financial model. f) As the project owners has taken the loan after placement of PO which is after decision making date. The assumptions for Debt financing are derived from the prime lending rate published by RBI and moratorium has been considered. g) As all the projects that are included in the bundle are captive power projects that have to pay the banking charges for the amount of electricity banked into the grid that can be consumed later. For the purpose of analysis, we have considered the number of units banked as 50% of the electricity generated which will amount to effective rate of banking as 2.5%. The error in calculation is corrected in the investment analysis. h) According to the DOE comment we have removed administrative expenses from the revised financial working. i) The O&M expense has been taken from the supplier's offer as the assumptions that are taken in the analysis should be derived from the information that is available to the owner at the time of investment decision (as per investment guidance). Supplier offer demands for advance payment towards O&M cost for the full year. However sensitivity has been carried out on period for advance payment towards O&M cost. 2. For the accelerated depreciation only the RE components of the project cost are allowed and hence we have considered only the RE components for IT depreciation. Further amortised value of the asset has been added back in cash flow statement year on year as per book depreciation and left over 10% is added back as salvage. 3. We would like to submit to DOE that
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	wind project doesn't come under TUFs subsidy. Following link can be envisaged for reference http://www.thehindubusinessline.com/2005/03/05/stories/2005030502040400.htm
Additional Comment	Justification and corrections made against the all issues in the CAR are acceptable. Hence the CAR is closed.
Conclusion	☐ To be checked during the next periodic verification ☐ PD was corrected correspondingly ☐ Spread sheets were corrected correspondingly ☒ Appropriate action was not taken ☐ The project complies with the requirements

Baseline & Additionality	CAR B3
Classification	☒ CAR ☐ FAR ☐ CR ☐ None
Findings	1. Computing IT depreciation based on the assumption 90% as WEG cost is not acceptable. The detailed project cost break up should be given and the computation should be based thereon. 2. While tax liability has been computed at 33.66%, tax shield has been computed at 33.99%
Corrective Action	1. The capital cost break-up is given in the worksheet and IT depreciation is applied to the RE component of the capital cost that is allowed as per IT depreciation. 2. The inconsistency has been addressed in the revised PDD. Surcharge on Tax is changed to 2% and hence effective tax will be 33.66% for all the sub-projects included in the bundle as all the subprojects that are included bundle have a decision making and purchase order before April 2007.
DOE assessment	1. Cost break up has been furnished and the IT depreciation has been provided

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	on the WEG only. CAR is closed 2. Tax rate has been taken uniformly. CAR is closed
Conclusion	☐ To be checked during the next periodic verification ☐ PD was corrected correspondingly ☒ Spread sheets were corrected correspondingly ☐ Appropriate action was not taken ☒ The project complies with the requirements

Baseline & Additionality	CAR B4			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	a) Net cash flow for IRR computation is not acceptable for the following reasons: a) As the assets have been depreciated only to the extent of 90%, there should be salvage value of atleast 10%. Even this salvage value has not been provided in the Cash flow statement b) Current assets should not be adjusted in the cash flow statement as IRR is concerned with cash generation and not cash balance c) Interest added back should not be adjusted to tax once again as the tax shield provided by interest has already been accounted for in the computation of profit after tax d) Since Premier Fine Yarn, Coimbatore Twisted commenced generation in March 2007 and Bannari Amman the investment had taken place in the same year as generation had commenced. Hence, the cash outflow should be netted out with cash inflow of the first year 2. Sensitivity analysis does not conform to Annex 45 of EB 41			
Corrective Action	1. Net Cash Flow for IRR computation a) Book depreciation for the project activity has been considered as 90%			

	and the balance value is added back as salvage value in the worksheet. b) increase/Decrease in current assets requires the PP to supplement the investment by the amount of working capital in case of wind power projects. If the requirement of this additional capital is not adjusted, the cash flow will be overestimated and hence the project IRR will not be true. Therefore we have considered it appropriate to consider adjustment of the current asset in computing cash flow. c) The worksheet is corrected for the adjustment of tax in the cash flow. d) Since the timing of the capital outflow in comparison to cash inflow determines the project returns for the project activity. Therefore we have used the XIRR function that takes to account the timing of cash inflow and outflow and have not netted off the values of capital investment with revenues for the same financial year. The spreadsheet for the example given below is provided to the DoE. 2. There are three critical parameters to which the project activity is sensitive:- • Capital Cost • Tariff • Plant Load Factor The capital cost for the project activity is taken from the supplier's offer and hence it is appropriate to conduct sensitivity on capital cost at a variation of 10% over the base case. Tariff for the project activity is taken from the tariff order issued by Tamilnadu State electricity Commission. As per national tariff policy [by Ministry of Power] dated 6 January 2006, the cross-subsidy surcharge should be brought down progressively and, as far as possible, at a linear rate to a maximum of 20% of its opening level by the year 2010-11. [Source:
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	http://www.orierc.org/new1/documents/National%20Electricity%20Tariff%20Policy.pdf]. The industrial tariff is ought to come down in coming years as mandated by the NTP, we have considered the present tariff for calculating the returns from the wind power project as a conservative measure for the energy offset from the grid. Applicable tariff for the power that is offset against the grid import for industrial use is charged at INR 3.65 per Kwh. Therefore it is unlikely that the project would displace a tariff of INR 3.65 per Kwh on the entire generated electricity. Therefore we have considered it appropriate not to conduct sensitivity on HT Tariff. Sensitivity Analysis of the project IRR to the Plant Load Factor (the most critical assumption) has been carried out considering variation of $\pm 10\%$ in the generation. The result of the analysis are included in the PD.
DOE Assessment	b) Conclusion on net cash flow are as given below: c) The residual value has not been added to the cash inflow, though it has been provided. d) Cash flow is concerned with cash generation and not cash balance. Explanation is not acceptable. CAR is open e) Tax adjustment in the interest has been removed. CAR is closed f) This is not acceptable for two reasons, viz., if the PP chooses to adopt <i>timing</i> for cash outflow, principles of consistency demand that the same procedure should be adopted for cash inflow also as they do not accrue only at the end of the year. IRR is conventionally computed on yearly basis. Hence, the explanation and working are not acceptable. CAR is open (12.09) 2. The explanation is convincing.
Corrective Action #2	1 a) We agree with DOE observation and accordingly the residual value has been added

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	in cash flow. b) We would like to submit to DOE that increase and decrease in current asset is on the account of working capital requirement for the business. We will like to submit that the owner has to supplement the cash to the project for working capital to keep it running that can either be substituted by the cash generated from the project or the external borrowing. As we have foregone the external borrowing (working capital loan) to supplement the cash requirement of the business, this has to be adjusted against the cash generated from the project activity. The left over advance will be supplied back to the business in the last year. Same has been added as a separate item in the cash flow. d) We would like to clarify that the capital investment is intermittent and the cash flows generated by the project activity are continuous for the financial year. Also, the interest capitalised on the capital will be very high due to lag in the timing of the capital outlay and the financial year closing. Further, the continuous flow of revenues will mean that interest capitalised on the cash inflow is minuscule compared to the capital outlay which can be forgone for simplicity of the analysis. However for conservativeness, the cash outflow and inflow is aggregated to financial year.
DOE Assessment# 2	Justification is acceptable. Hence CAR is Closed.
Conclusion	☐ To be checked during the next periodic verification ☐ PD was corrected correspondingly ☒ Spread sheets were corrected correspondingly ☐ Appropriate action was not taken ☒ The project complies with the requirements

Baseline & Additionality	CAR B5			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	Benchmark computation appears to suffer from the following inadequacies:			

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	a) Use of BSE Sensex (as proxy for R_m) does not seem to represent a fully diversified portfolio, one of the pre-requisites of CAPM; b) Use of interest rate on Central and State Government securities presupposes the feasibility of investor purchasing the securities at par, which does not seem to be correct c) Beta value of all power generating companies do not seem to have been considered d) Using unlevered equity beta of the company not only implies that the leverage of listed companies and the project activity is the same (which does not appear to be true), but is also not conservative. e) Computation of Index based on the weighted average interest rates of G-Sec though not used in the CAPM (as it inherently assumes that the investor would be able to invest in the basket on year-to-year basis, which is questionable on theoretical platform as well as practical application to the project scenario, where the investment is made once with benefits flowing therefrom year after year). f) Reason for choosing 2.46% as interest rate is not known. g) Use of MAT for computing post tax cost of debt, which does not seem to be applicable to any of the companies in the bundle.
Corrective Action	a) The BSE sensex data is replaced with BSE-500 to represent the better portfolio of projects. b) Interest rate is revised to long term yield rate instead of the central bond rate in the revised worksheet. c) Beta of all the companies that were listed and have the data for the period of 3 years has been considered for computing the applicable beta. d) The debt equity ratio of the

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	companies considered for computing beta is lower than the normative debt equity ratio (70:30) that is acceptable for investment in power sector. Hence the beta value considered for evaluation of the WACC is conservative. e) The risk free rate is revised to long term yield rates published by RBI for computation of WACC. f) The risk free rate is revised to long term yield rates published by RBI for computation of WACC. g) We agree with DOE's observation. Now, post tax cost of debt has been calculated based on regular tax and not MAT.
DOE Assessment	a) Use of BSE 500 is accepted. CAR is closed b) Use of YTM is accepted. CAR is closed c) Accepted. d) OK e) Use of YTM is accepted. CAR is closed f) Revision of interest rate is accepted. CAR is closed g) Regular tax rate has been used. CAR is closed
Conclusion	☐ To be checked during the next periodic verification ☐ PD was corrected correspondingly ☒ Spread sheets were corrected correspondingly ☐ Appropriate action was not taken ☒ The project complies with the requirements

Baseline & Additionality	CR B1			
Classification	☐ CAR	☐ FAR	☒ CR	☐ None
Findings	Following clarification associated with additionality determination are found: 1. Though MAT has been provided for all the years, the provision is accounted in a few years in the profit and loss account. For example, in 2008-09, 2009-10 and 2018-19 to 2021-22 for Premier Spg. & Wvg., and 2007-08, 2008-09 and			

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	2017-18 to 2020-21 for Premier Fine Yarn. Clarify whether MAT is applicable to the project activity as per IT Act. 2. It may be clarified how the VCS revenues were considered essential to overcome the investment barrier to this project activity, in particular that the benchmark (of 19%) represents a rate below which the investment could not be made.
Corrective Action #1	1. Yes MAT is applicable for this project because this project falls under section 80IA of IT act and as per the section all infrastructure projects enjoy tax holiday of 10 consecutive years out of first 15 years of commissioning. For this period of tax holiday regular tax is not applicable hence only MAT should be paid by the customer. 2. The weighted average cost of capital is considered as benchmark in accordance with the guideline for investment decision All the sub-project included in the bundle have the project IRR less than the benchmark. Therefore, the project activity need assistance in the form of carbon revenues to be viable and hence can be considered as additional.
Additional Comment	1. Accepted 2. The response does not answer the CAR. However, the very fact that the investment had taken place despite the fact that the IRR of the project activities does not cross the benchmark even with VER benefits reveal that the investment had taken place even at a return less than the benchmark. CR is open in this context
Corrective Action#2	2. The analysis with carbon revenues is included in the revised worksheet. It is clear from the investment analysis that the carbon revenues are essential for the project activity. Moreover As per

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	the CDM guidance, carbon revenues help in reducing the gap between the Project IRR and the benchmark rate. Hence in the case of project activity also, CDM/VCS revenue is important to reduce this gap.
DOE Assessment#2	Justification is acceptable.Hence, CR is closed.
Conclusion	☐ To be checked during the next periodic verification ☐ PD was corrected correspondingly ☒ Spread sheets were corrected correspondingly ☐ Appropriate action was not taken ☒ The project complies with the requirements

Baseline and additionality	FAR 1			
Classification	☐ CAR	☒ FAR	☐ CR	☐ None
Findings	If the PLF of the project activity exceeds the range sensitivity analysis the additionality of the project will be re-assessed during every crediting period, The VERs will be issued if the project is additional." (Refer Annex 66,67 of EB48)			
Corrective Action				
Additional Comment				
Conclusion	☒ To be checked during the next periodic verification ☐ PD was corrected correspondingly ☐ Spread sheets were corrected correspondingly ☐ Appropriate action was not taken ☐ The project complies with the requirements			

3.3 Monitoring Plan

The project applies the monitoring methodology ACM0002/Version10:"Consolidated baseline methodology for grid-connected electricity generation from renewable sources".

- This methodology stipulates that monitoring shall consist of electricity exported from the project activity and operating margin emission factor and build margin emission factor of the grid, where ex

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post determination of grid emission factor has been chosen. Since the baseline methodology is based on ex ante determination of the baseline, the monitoring of operating margin emission factor and build margin emission factor is not required. This methodology stipulates that monitoring shall consist of metering the net electricity exported to the grid by the renewable technology. However, the project activity consists of dedicated individual/group of meter and thus the net electricity would be calculated out of dedicated meter. The detailed procedure to calculate the net electricity generated by the project activity WECs is explained in section 3.2 of the VCS PD and was assessed to be appropriate.

- The monitoring plan provides detailed information in the VCS-PD 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

Monitoring : Two-way export Trivector meter will be used for monitoring.

Accuracy : Class 0.5s

Data type : Measured

Frequency : Hourly Measured

Recording : Monthly from Joint meter

Archiving : Paper & Electronic

Calibration Frequency : Once in a year, Project Head would be responsible for regular calibration of the meter.

Nevertheless following CARM1 and CARM2 was raised and closed successfully during the validation.

Monitoring	CAR M1
Classification	☒ CAR ☐ FAR ☐ CR ☐ None
Findings	1. The monitored parameters are not as per the methodology ACM0002, correction is required. 2. The pro-rata calculations for Net electricity supplied to the grid are required to be detailed in the VCS PD. Correction is required

	regarding the same. 3. PP should clearly state title and reference of the VCS methodology which should include the monitoring requirement and explanation of methodology choices in section 3.1 of MR.
Corrective Action	1. The net electricity supplied to the grid is calculated by subtracting electricity imported by electricity exported to the grid. The monitoring parameters are therefore EG_{ex} and EG_{im}. The net electricity exported shall be calculated as:- $EG_{net} = EG_{ex} - EG_{im}$ 2. There is separate metering point for each of the investor and hence there is no need for pro-rata calculation for electricity generation for the project activity. 3. The title and reference of the methodology is stated in the revised PD. The monitoring requirements for the project activity includes:- ▪ Metering procedures ▪ Calibration Frequency ▪ Data Archiving ▪ Monitoring roles and responsibility All the above requirements are listed in detail in section 3.2 of the PD.
DOE Assesment#1	According to ACM 0002, gross generation has to be included in the monitoring section.
Corrective Action #2	Correction has been made in section 3.3 of revised VCS PD. Gross generation has been added in revised PD, wherein the net electricity exported shall be calculated as:- $EG_{y, net} = EG_{y, export} - EG_{y, import}$
DOE Assesment#2	The Required correction is done and thus the CAR is closed
Conclusion	☐ To be checked during the next periodic verification

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	☒ PD was corrected correspondingly ☐ Spread sheets were corrected correspondingly ☐ Appropriate action was not taken ☒ The project complies with the requirements
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Monitoring	CAR M2
Classification	☒ CAR ☐ FAR ☐ CR ☐ None
Findings	All of the 7 subheading mentioned under section 3.2 should be clearly detailed in the VCS-PD. (Cp section 3.2 of the VCS-PD template)
Corrective Action	All the seven sub-headings under section 3.2 are detailed in the revised PD.
Additional Comment	VCS PD is revised. CAR is closed
Conclusion	☐ To be checked during the next periodic verification ☒ PD was corrected correspondingly ☐ Spread sheets were corrected correspondingly ☐ Appropriate action was not taken ☒ The project complies with the requirements

3.4 Calculation of GHG Emissions

- The applied methodology is correctly applied for the calculation of emission reductions calculation.
- The project intends to reduce carbon dioxide (CO₂) emissions by generating electricity from a renewable energy and use for captive purpose using the state electricity board.
- There are no GHG emissions arising from the project it being a wind project. Hence, the project emissions are zero. As the project activity does not involve transfer of energy generating equipment from another activity or the existing equipment is transferred to another activity, the leakage due to the project activity is not applicable.
- The emission reduction is calculated based on the difference of baseline emission, project

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emission and leakage. For this project activity project emission and leakage is zero. So, emission reduction is equal to baseline emission. The baseline emission is calculated based on net electricity exported (=Electricity export-Electricity import) to the TNEB regional grid (which is part of Southern grid) multiplied by the grid emission factor for the Southern grid which is correctly documented and as per the requirement of ACM0002.

- Calculation Methodology for Data recorded/useful/used for Net electricity export and subsequently to the reduction in GHG emission figure.
 - **Energy Export**: Energy export is a measured parameter
 - **Energy Import**: Energy imported from the grid for start-up of WECs is calculated by energy import reading of main meter
 - **Net Energy Exported to grid**: Net Energy Exported to grid is calculated as per PPA

Net Energy Exported to grid = (Energy Export to grid - Energy imported from the grid for start up.

The project activity contained dedicated group/Individual meter and thus the net electricity is calculated based on electricity export and electricity import values from the dedicated meters. The calculation provided in VCS PD was assessed to be OK.

The validation team has checked the underlying input values as well as the computation in the spreadsheet^{/XLS/}. The estimation of the baseline emission was realized in a transparent and conservative manner and is well documented under section 4.2-4.4 of the VCS PD.

- As per the final VCS PD^{/VCS PD2/} the project is expected to reduce emissions of 69,747 tCO2e/year over a 10 year crediting period.

Nevertheless following CARC1 was raised and closed successfully during the validation.

Calculation of GHG emissions	CAR C1			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	Following discrepancies are found regarding the calculation of GHG emissions: 1. Section 4.1 should include <u>only the methodological choice</u> for the project activity (Cp VCS-PD template). 2. The description as mentioned in section 4.1 should be segregated under section 4.2, 4.3 and 4.4 considering the baseline calculation, project calculation and total emission reduction calculation respectively. VCS-PD requires correction in this regard. 3. PP should include the version of CEA used in the PD. Details can be included in Annex 1 of the VCS-PD.			
Corrective Action	1. The section 4.1 is limited to the choice of methodology in the revised PD. 2. The description under section 4.2, 4.3 and 4.4 is revised to represent baseline calculation, project calculation and total emission reduction calculation respectively. 3. The detail on the CEA version used for calculation of emission factor is included in section 4.1 of the revised PD.			
Additional Comment	VCS PD is revised. CAR is closed			
Conclusion	☐ To be checked during the next periodic verification ☒ PD was corrected correspondingly ☐ Spread sheets were corrected correspondingly ☐ Appropriate action was not taken ☒ The project complies with the requirements			

Furthermore following CAR was raised as the validation progresses:

Calculation of GHG emission	CAR Cl.a			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	Emission factor used in calculation of Emission Reduction calculation is not correct. Correction required for the same.			
Corrective Action	Emission factor has been corrected to 0.9269 tCO _{2e} /GWh			
Additional Comment	Corrections have been made wherever applicable. Hence the Car is closed			
Conclusion	☐ To be checked during the next periodic verification ☒ PD was corrected correspondingly ☐ Spread sheets were corrected correspondingly ☐ Appropriate action was not taken ☒ The project complies with the requirements			

3.5 Environmental Impact

Environmental Impact Assessment (EIA) of this project is not an essential regulatory requirement, as it is not covered under the categories as described in EIA Notification of 1994 or the Amended Notification of 2006.

3.6 Comments by stakeholders

The comments from local stakeholders were invited through two local stakeholder meeting conducted at Shanmuganantha Bhavan Hall, Palani Taluk, Dindigull district on 05th of September, 2007 and another meeting conducted at Rotary centenary hall, Dharapuram, Erode, Tamil Nadu on 04th December 2006.

A summary of the comments received and a note (through meeting and feed back questionnaire) on how due account was taken of the concerns raised in the above public consultation are included in VCS PD. All comments are positive in nature. No adverse comments were received and this is addressed in the VCS PD^{VCS}
 PD2/ .

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Nevertheless following CAR L1 was raised and closed successfully during the validation.

Local Stakeholder Comments	CAR L1			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	The local stake holder consultation process should be detailed out. What is the medium of communication to Local stake holders, who are the participated local stake holders and whether any adverse comments received during this process? Correction is required regarding the same.			
Corrective Action	The PD is revised to include the medium of communication used to intimate the local stakeholders and the minutes of the meeting in section 6 of the PD.			
Additional Comment	VCS PD is revised. CAR is closed			
Conclusion	☐ To be checked during the next periodic verification ☒ PD was corrected correspondingly ☐ Spread sheets were corrected correspondingly ☐ Appropriate action was not taken ☒ The project complies with the requirements			

4. Validation Opinion

The M/s Enercon (India) Limited has commissioned the TÜV NORD JI/CDM Certification Program to validate the project: “Bundled Wind Power project in Tamil Nadu managed by Enercon India Limited - II” with regard to the relevant requirements of the VCS 2007.1 Program Guidelines, as well as criteria for consistent project operations, monitoring and reporting.

The main purpose of the project activity is to generate fuel free carbon neutral electricity through sustainable means using wind power resources and use the state transmission grid (TNEB) for captive consumption , thereby displacing electricity of the Southern regional grid of India that would have been generated predominantly from fossil fuel based power generation.

A risk-based approach has been followed to perform this validation. In the course of the validation 10 Corrective Action Requests (CARs) and 1 Clarification request were raised which are successfully closed out and 01 FAR is raised which shall be checked during the verification.

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

In detail the conclusions can be summarised as follows:

- The project is in line with all relevant host country criteria (India) and all relevant VCS 2007.1 program guidelines requirements.
- The project additionality is sufficiently justified in the VCS PD.
- The monitoring plan is transparent and adequate and inline with applied baseline and monitoring methodology of ACM0002, version 10.
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 69,747t CO2e/year is most likely to be achieved within the 10 years (fixed) crediting period.
- The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation.

No restrictions or uncertainties were identified related to the validation.



Monojkumar Borekar
ValidationTeam Leader
Mumbai, 2009-09-24



Eric Krupp
Final approval
Essen, 2009-11-10

References

Table 5-1: Documents provided by the project proponent

Reference	Document
/ADD/	Following documents are provided related to additionality a) Quotation/Purchase Order supporting each of the components of capital cost b) O&M Cost and yearly escalation c) Insurance premium d) Loan sanction letter with terms
/CR/	Commissioning report of all the wind energy generators connected to the state grid to the project activity (= starting date of the Project).
/GEN/	Spreadsheet for historical electricity generation from the project activity.
/IRR/	Financial calculation sheet for the project activity.
/LSHC/	Proof of local stake holders consultation process • Minutes of Public hearing • List of Participants • Extract of feedback from local stakeholders.
/O&M/	Operation and maintenance contract
/VCS STD/	VCS Standard 2007.1
/VCS PD1/	Draft VCS PD version 1 which forms the basis for validation.
/VCS PD2/	Final VCS PD version 2 which forms the basis for validation opinion.
/PLF/	Proof of Plant Load Factor Calculation for all the WEGs

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Reference	Document
/PO/	Purchase order for Wind turbine generators (WEG), Electrical items, Erection and Commissioning of WEGs and Civil work
/PPA/	Power Purchase Agreement
/RD/	Declarations by project proponents stating no intention of creating and trading of another from of environmental credits out of VERs would be created from this given project (Cp Para 1.13 of VCS PD template)
/PT/	Proof of title for the project activity (Cp section 8.1 of the VCS PD template)
/SLP/	Site layout plan for all the WEGs related to the project activity
/TS/	Technical specification of wind energy generators from manufacturer and electricity meters.
/XLS/	1.Baseline and emission reduction calculation spread sheet 2. Revised Baseline and emission reduction calculation spread sheet

Table 5-2: Background investigation and assessment documents

Reference	Document
/ACM0002/	Consolidated baseline methodology for grid-connected electricity generation from renewable sources
/CPM/	TÜV Nord JI / CDM CP Manual (incl. CP procedures and forms)
/CEA/	CO2 Baseline Database for Indian Power Sector – User Guide, Ver4 published by CEA. The same was assessed by TUV NORD in accordance with Tool to determine emission factor.

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/KP/	Kyoto Protocol (1997)
/MA/	Decision 17/CP.7 (Marrakesh - Accords)
/VCS STD/	Voluntary Carbon Standard 2007.1
/VVM/	IETA, PCF Validation and Verification Manual (V.4)
/ISO/	ISO 14064-2; ISO 14064-3, ISO 14065

Table 5-3: Websites used

Reference	Link	Organisation
/cea/	www.cea.nic.in	Central Electricity Authority
/dna-i/	http://cdmindia.nic.in/	The Designated National Authority of India
/moef/	http://envfor.nic.in/	Ministry of Environment and Forests.
/unfccc/	http://cdm.unfccc.int	UNFCCC
/vcs/	www.v-c-s.org	VCS website

Table 5-4: List of interviewed persons

Reference	MoI1		Name	Organisation / Function
/IM01/	V	☒ Mr. ☐ Ms.	Himanshu Bhatnagar	Enercon (India) Limited
/IM01/	V	☒ Mr. ☐ Ms.	Rohit Joshi	Enercon (India) Limited

1) Means of Interview: (Telephone, E-Mail, Visit)

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