

VCS 2007.1 Validation Report of the GHG emission reduction project entitled "22.5 MW Wind Power Project by Ruchi Soya Industries Limited at Palsodi, District-Ratlam, Madhya Pradesh"



Voluntary Carbon Standard 2007.1
Final Validation Report

Report Number: **53120009 – 09/140**

Name of Verification company:	Date of the issue:
TÜV NORD CERT GmbH	23/02/2010
Report Title:	Approved by:
22.5 MW Wind Power Project by Ruchi Soya Industries Limited at Palsodi, District-Ratlam, Madhya Pradesh	Mr. Rainer Winter
Client:	Project Title:
Ruchi Soya Industries Limited	22.5 MW Wind Power Project by Ruchi Soya Industries Limited at Palsodi, District-Ratlam, Madhya Pradesh
Summary:	
M/s Ruchi Soya Industries limited has commissioned the TÜV NORD JI/CDM Certification Program to validate the project: "22.5 MW Wind Power Project by Ruchi Soya Industries Limited at Palsodi, District-Ratlam, Madhya Pradesh" 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 export the power to Madhya Pradesh State electricity Board (MPSEB) , thereby displacing electricity of the NEWNE regional grid of India that would have been generated predominantly from	

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fossil fuel based power generation.

A risk-based approach has been followed to perform this validation. In the course of the validation 08 Corrective Action Requests (CARs) were raised and closed successfully.

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 46323 tCO_{2e}/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.

Work carried out by:	Number of pages:
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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 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

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

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- Project Baseline
 - Baseline methodology
 - Baseline GHG emissions
- 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 is promoted by M/s. Ruchi Soya Industries Limited (RSIL). The project activity involves supply, erection, commissioning and operation of 15 x 1.5 MW rated, Make - Suzlon Model S-82, Wind Turbine Generators (WTGs). The total installed capacity is 22.5 MW. The generated electrical power will be supplied to Madhya Pradesh State Electricity Board (MPSEB), connected with the NEWNE grid² at Madhya Pradesh State Electricity Board (MPSEB) - 132 KVA substations at Sailana (Ratlam).

² The Indian electricity system is now divided into two grids, the new Integrated Northern, Eastern, Western, and North-Eastern regional grids (NEWNE) and the Southern Grid

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All WTGs are located on the same site - "hills of Palsodi village of District Ratlam, Madhya Pradesh, India". 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 supply the electricity to MPSEB, thereby displacing electricity of the NEWNE 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 Version 10: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources". The estimated GHG reductions through the project activity are 46,323 tCO_{2e}/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 on from December 2008 to February 2010

Preparations : 10/04/2009 to 15/04/2009

Site Visit : 17/6/2009

(Draft) Reporting : 18/06/2009

(Final) Reporting : 23/02/2010

The entire validation has consisted of the following three phases.

2.1 Review of Document

The draft VCS PD^{/VCS PD1/} submitted by RSIL in March 2009 and supporting background documents related to the project design and baseline were reviewed on 10/04/2009 to 15/04/2009. Furthermore, the validation team used

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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 6-1)
- Background investigation and assessment documents (Table 6-2)
- Websites used (Table 6-3).

2.2 Follow-up Interviews

On 22/8/2009 and 23/8/2009, TÜV NORD JI/CDM CP had meeting with RSIL discussing the project details.

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

Interviewed Persons / Entities	Interview topics
	- 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 were submitted to the project proponent. The project design document was revised addressing the CARs issued by TÜV NORD JI/CDM CP.

After reviewing the revised and resubmitted project documentation^{/VCS PD2/}; resolving the CARs 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	06	-	-
M- Monitoring plan	01	-	-
C-Calculation of GHG emissions	-	-	-

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Validation topic	No. of CAR	No. of FAR	No. of CR
E- Environmental Impact	-	-	-
L- Local Stakeholder Comments	-	-	-
SUM	08	00	00

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: The project activity involves supply, erection, commissioning and operation of 15 x 1.5 MW rated, Make - Suzlon Model S-82, Wind Turbine Generators (WTGs). The total installed capacity is 22.5 MW. The generated electricity will be supplied to Madhya Pradesh State Electricity Board (MPSEB), connected with the NEWNE grid³ at Madhya Pradesh State Electricity Board (MPSEB) - 132 KVA substations at Sailana (Ratlam). The size of the individual project activity and technology implemented are cross checked with technical specifications^{/TS/} provided by the supplier respectively and are found OK.
- 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 29/2/2008.
 - o Project start date: 29/2/2008, the earliest commissioning date among the installations of WTGs is taken as the start date of the project activity which is cross-checked with the commissioning certificate^{/CR/} and found OK. Five (05) out of Fifteen (15) WTGs were commissioned

³ The Indian electricity system is now divided into two grids, the new Integrated Northern, Eastern, Western, and North-Eastern regional grids (NEWNE) and the Southern Grid

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on 29/02/2008. Also, this is the date for which project started the reduction of GHG emissions which is as per the VCS policy requirement dated 10th September 2008.

- Ownership

- o Proof of title : The ownership of the project is with Ruchi Soya Industries limited. The operation and maintenance contract with the Machine supplier^{/O&M/} and purchase orders^{/PO/} is being cross verified by the validation team and is found OK.
- 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 1.11 of VCS PD should only address the risks that may substantially affect the projects' GHG emission reductions or removal enhancements. 2. Eligibility of the project and quantification of emission reduction , including legislative , sectoral, site specific and temporal needs to be explained fully under section 1.16 of VCS-PD			
Corrective	1. Section 1.11: Irrelevant points			

Action	have been deleted out. 2. Section 1.16:Re-written as per comment.
DOE Assessment	1. In section 1.11 only the risk that may substantially affect the project is addressed correctly in the revised PD. Hence, CAR is closed. 2. All the requirement of section 1.16 as per VCS PD template is addressed correctly in the revised 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

3.2 Baseline

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.
- 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 ($EF_{grid,CM,y}$) is taken from CEA data base version 05/^{CEA}. The grid boundary w.r.t the connected state grid is NEWNE Regional Grid of India. The combined margin of emission factors (CM) is taken as 0.92248 tCO_{2e}/MWh for NEWNE regional grid and will fixed ex-ante for the entire crediting period. The annual power generation from the project activity is estimated to be 502168 MWh over the entire crediting period. The power production through wind turbines depends on many factors like the speed of wind and the grid

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availability factor etc., which are external factors to the system. As per annex 11 of EB48 the project participant hired an engineering company/^{PLF}/ to estimate the plant load factor of the project activity. The estimated plant load factor is 25.68%.

- Altogether the project activity reduces emissions of 46323 tCO_{2e}/year over the ten year fixed crediting period.

Nevertheless, CAR B1, CARB1.a and CAR B2 had to be raised and were successfully closed.

Baseline & Additionality	CAR B1			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	The Latest version of the Methodology ACM0002 available should be used. Correction is required.			
Corrective Action	ACM 0002, version 9 (EB 45) has been applied as it was latest at the time of submission of VCS-PD to the DOE for validation.			
DOE assessment	The latest version of the methodology is used.			
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 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			

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	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.
DOE assessment	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

Baseline & Additionality	CAR B2			
Classification	☒ CAR	☐ FAR	☐ CR	☐ None
Findings	GHG Sinks and reservoir for the baseline scenario and project should be incorporated under section 2.3.			
Corrective Action	Section 2.3: GHG sinks and reservoirs have been incorporated.			
DOE assessment Comment	The GHG sinks and sources are included in the PD and thus 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			

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 are summarised below. This table also includes the assessment of the validation team.

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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.

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 two alternatives for the project activity, viz.

(a) Setting up the project activity without VCS benefits.

(b) Continuation of current scenario i.e. additional power is supplied by current power generating units and / or new power generating units coming up in the NEWNE grid.

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;

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(a) Setting up the project activity without VCS benefits.

(b) Continuation of current scenario i.e. additional power is supplied by current power generating units and / or new power generating units coming up in the NEWNE grid.

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

Hence, alternative (b) 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 Tool for the demonstration and assessment of additionality (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. PLR as the benchmark has been chosen

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for the project as because the project is 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 Prime lending rate (PLR) can be considered as appropriate benchmark for project IRR.

DOE checked the various inputs used in the calculation, correctness of various financial parameters used with the 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 58 of EB 51.

The computations reveal that the project yields an IRR of lower than the benchmark PLR. 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.

The total cost associated with the following cost parameters affect the total project cost more than 20%:

- Cost of WTGs
- Interest Rate
- O&M Charges

Cost of WTGs is decided initially and will remain unchanged during whole crediting period. Interest rate may vary as it depends on PLR. Even O&M cost is decided at the time of investment decision for initial period of 10 years but after that it will be mutually decided hence this parameter may also be considered as a variable. Therefore, variations of $\pm 10\%$ in interest rate and O&M charges have been considered for the sensitivity analysis. Other cost parameters like insurance and loan processing fee have very less impact on total cost of the project. Therefore, these parameters were not considered for conducting sensitivity analysis.

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The project revenue is mainly affected by following parameters:

- Plant Load Factor (PLF)
- Tariff

PLF and Tariff are very important parameters to see the financial viability of the project. Hence, variations in PLF and tariff by $\pm 10\%$ are considered for the sensitivity analysis.

The following scenarios are developed without taking VCS revenue into account for sensitivity analysis:

Scenarios	Project IRR (20-year cash flow) without VCS revenue		
Variation	-10%	0%	+10%
On varying the O&M charges	11.19%	10.86%	10.53%
On varying the interest rate	10.76%	10.86%	10.97%
On varying the tariff rate	8.71%	10.86%	13.08%
On varying the PLF	8.98%	10.86%	12.82%

Project IRRs (20-years cash flow) fall in the range of 8.71% -13.08% in all the scenarios and could not cross the selected benchmark of 13.10% in any scenario.

The above investment analysis is based on PLF as estimated by the third party, an engineering company contracted by the PP (as per Annex11 EB48), while the risk of lower generation compared to the estimated generation is always inherent in such projects. Thus, overall investment analysis clearly indicates that the project is definitely financially unattractive without VCS revenue. VCS benefits are decisive factor in the project activity as VCS revenue makes the project activity financially viable when higher PLF is considered. Therefore, it can be concluded that the project activity needs VCS revenue to become financially viable.

Common Practise Analysis: The statistics furnished by the PP as well as independently collected by DOE; reveal that penetration of wind power source could not reach even 1% in Madhya Pradesh, which is much lower than that of in other major states like Maharashtra (8.02%) and Karnataka (10.5%) as on 31/3/2007

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(http://www.cea.nic.in/power_sec_reports/Executive_Summary/2007_03/22-28.pdf) while for wind installed capacity (<http://www.windpowerindia.com/statyear.html#top>), during the investment decision. Though validation team is convinced that contention of PP that wind power projects are not common practice in Madhya Pradesh, 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.

The individual arguments presented in the PD (section 2.5) to justify the additionality are summarised in table 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 plants and by addition of new generation sources. Accordingly, the realistic and	Though there are no mandatory law or regulation which enforces project promoters to adopt the wind electricity generation; however the DOE checked clearances obtained by PP from the regulatory body and the context of the clearances is described below: The implementation of the project activity is a voluntary initiative and it is

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Step as per Additionality tool Version 05.2	Argument	Assessment
	credible alternatives to the project activity are: (a) Setting up the project activity without VCS benefits. (b) Continuation of current scenario i.e. additional power is supplied by current power generating units and / or new power generating units coming up in the NEWNE grid.	not mandatory or a legal requirement. The project has received the necessary clearances (Consent from MP Urja Vikas Nigam and Commissioning certificates). The Indian 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 for power generation. There is no legal requirement on the choice of a particular technology for power generation in India. Thus, the most plausible baseline scenarios assessed to be the following: Alternative (a) may be a part of the baseline. However, this alternative faces investment barrier.

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Step as per Additionality tool Version 05.2	Argument	Assessment
		Thus, Alternatives (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 PLR (Prime lending rate) as a benchmark during (conservative estimate) 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; b) conducting an assessment of parameters and assumptions used in calculating the financial indicator and determining the accuracy and suitability of parameters;

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Step as per Additionality tool Version 05.2	Argument	Assessment
		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 wind power project, hence benchmark values computed to the project is depending upon the time of investment period. PLR as the benchmark has been chosen for the projects which are funded more by debt portion in comparison to equity part to compare with project IRR.

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Step as per Additionality tool Version 05.2	Argument	Assessment
		DOE 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 PLR. ☒ Step passed ☐ Step not passed ☐ Not applicable
Step3: Barrier analysis	NA	NA
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 DOE, reveal that wind power projects are not business as usual in state of Madhya Pradesh during the investment decision. ☒ Step passed ☐ Step not passed ☐ Not applicable

Nevertheless following CARB2- CARB6 were raised and closed successfully during the validation.

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Baseline & Additionality	CAR B3
Classification	☒ CAR ☐ FAR ☐ CR ☐ None
Findings	The following w.r.t financial calculations needs to be clarified/corrected; • Generation assumed should be the machinery supplier guaranteed generation or the PLF recommended by MPERC, whichever is higher. • The project cost of Rs.58.4 mn. is more than 25% higher than Rs.46 mn. recommended by MPERC. Based on DOE's experience also, this appears to be quite high. As this impacts additionality, this needs to be explained.
Corrective Action	• Generation of electricity has been evaluated as the PLF estimated by the third party contracted by the PP. • The project cost is actual cost and the PO(s) have also been placed for the same amount. DOE has already verified all the POs.
DOE assessment	• The PLF is ^{/PLF/} determined by the contracted third party organisation and the report is checked by the validation team and found that the PLF assumed is as per the report which is in accordance with EB48 Annex 11. Hence, the CAR is closed. • The entire PO is verified and found ok. 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

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Baseline & Additionality	CAR B4
Classification	☒ CAR ☐ FAR ☐ CR ☐ None
Findings	The PP needs to address the following issues; • Providing book and IT depreciation on entire assets without segregating evacuation deposits is not acceptable as 50% of the evacuation deposit is refundable and should form part of cash inflow from the second year of operation upto seventh year. Also, providing full year book depreciation when the assets have been put to use for part of the year is not in conformity with accepted accounting principles. • The Tax holiday u/s 80IA should end on the 13th year March 31, 2020 as the project activity incurs loss only in the first 3 years. Hence regular tax should become payable from the year 2020-21 onwards. This may be checked and corrected.
Corrective Action	• Evacuation deposit is not refundable in M.P. as per power purchase agreement and tariff order applicable to the project activity. • Book depreciation has been re-evaluated on pro rata basis. • IT depreciation is applied after segregating the cost items applicable for 80% / 10% depreciation. • Tax holiday u/s 80 IA has been re-applied as per IT Act.
DOE assessment	• Justification is acceptable. Hence, CAR is closed. • Book depreciation has been incorporated on pro-rata basis. Hence, CAR is closed. • Corrected. Hence, CAR is closed. • Tax holiday is included as per u/s

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	80IA guidance. 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	Cash flow considered for IRR calculations is not acceptable for the following reasons: a) tax shield has not been accounted for; and b) Evacuation deposit refund has not been accounted for.
Corrective Action	- Revised tax calculations accounting the tax shield automatically. - Evacuation deposit refund is not applicable to the project activity as per tariff order and power purchase agreement.
DOE assessment	- Tax shield is accounted for the calculation of IRR and thus CAR is closed. - Justification is applicable and validated by the DOE. 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 B6
Classification	☒ CAR ☐ FAR ☐ CR ☐ None
Findings	The benchmark selected for the project is based on WACC however, the Expected return on equity computation is not acceptable for the following reasons: i. Use of BSE Sensex as proxy for market risk premium not acceptable because Sensex is not a well-diversified portfolio, unless it is proved that it is conservative as compared to the use of other indices. ii. Beta value does not seem to include all power companies listed and traded in stock exchange. iii. Moreover, average beta (giving equal weightage) does not seem to establish the conservativeness adopted in the approach. iv. Beta has been computed based on one year observations only with monthly class intervals. v. In calculating beta, 'varp' function has been used, which inherently assumes that the data represents entire population and results in over-estimation of beta. vi. Taking the equity beta into consideration without un-leveraging it pre-supposes the leverage is the same for candidate projects and the listed companies, which does not seem to be correct. vii. Assumption of MAT at 11.33% for computing WACC does not seem to be appropriate in as much as the computation assumes that the company does not have any other income and in the process artificially boosts the WACC (benchmark). viii. Cost of equity of 26.75% is much higher than 16% (pre tax) recommended by MPERC and hence not

	conservative.
Corrective Action	PP has taken the benchmark prime lending rate (PLR) as the benchmark for the project activity that is lower than the earlier one and hence conservative also.
DOE assessment	Since PLR has been taken as the benchmark and it conforms to the guidance given in Annex 45 of EB 41 and it is also lower than the benchmark considered earlier, 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

3.3 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-ante 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 WTGs is explained in section 3.2 of the VCS PD and was assessed to be appropriate.

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- 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^{/PPA/}.
 Accuracy : Class 0.5s^{/PPA/}
 Data type : Measured^{/PPA/}
 Frequency : Continuously Monitored
 Recording : Monthly from Joint meter^{/PPA/}
 Archiving : Paper & Electronic
 Calibration Frequency : Once in a year^{/PPA/}, Project Head would be responsible for regular calibration of the meter.

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

Monitoring	CAR M1
Classification	☒ CAR ☐ FAR ☐ CR ☐ None
Findings	The PP requires describing the Methodological choices w.r.t to ACM0002 under the section 3.1. Correction is required.
Corrective Action	Section 3.1 has been re-written as per comment.
DOE Assessment	The section is modified and 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

3.4 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 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 MPSEB regional grid (which is part of NEWNE grid) multiplied by the grid emission factor for the NEWNE 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
 - **Total Electricity generated EG_{TOTAL, y}**: Total electricity generation by the wind mills during the year y. However, this value has not any direct impact on emission reduction calculation.
 - **Energy Import**: Energy imported from the grid for start-up of WTGs is calculated by energy import reading of main meter

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- **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 contains two dedicated meters for the project. 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 46,323 tCO_{2e}/year over a 10 year crediting period.

3.5 Environmental Impact

Wind power is one of the cleanest sources of renewable energy, with no associated emissions and waste products. As per the Schedule 1 of notification issued by Ministry of Environment and Forests (MoEF), Government of India on September 14, 2006, thirty-nine activities are required to undertake environmental impact assessment studies⁴. The proposed project activity does not fall under the list of activities requiring EIA as it will not involve any negative environmental impacts. Thus, no detailed EIA study was conducted.

3.6 Comments by stakeholders

RSIL conducted a stakeholder's consultation meeting on 13th May, 2008 at the project activity site, Village - Palsodi (Ratlam), to get the comments and suggestions of the local stakeholders on the project activity. Following are the stakeholders identified for the project activity:

⁴ <http://envfor.nic.in/legis/eia/sol533.pdf>

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- Local Community
- Non Government Organizations
- Village Panchayat
- Wind Farm Developers (Suzlon)
- Consultants

Formal invitation letters were sent to different stakeholders well in advance for the stakeholder's consultation meeting for the VCS project activity. The stakeholders present in the meeting were local villagers, deputy sarpanch (village chief), ex sarpanch (village chief), teachers from local school, Gram Panchayat (Local Governing Body of a Village) members, employees of Suzlon etc.. No adverse comments were received during and after the meeting and is being cross checked by the validation team^{/LSHC/}

4. Validation conclusion

M/s Ruchi Soya Industries limited has commissioned the TÜV NORD JI/CDM Certification Program to validate the project: "22.5 MW Wind Power Project by Ruchi Soya Industries Limited at Palsodi, District-Ratlam, Madhya Pradesh" 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 export the power to Madhya Pradesh State electricity Board (MPSEB) , thereby displacing electricity of the NEWNE 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 08 Corrective Action Requests (CARs) were raised and closed successfully.

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

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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 46323t CO_{2e}/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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Monojkumar Borekar
Validation Team Leader
Mumbai, 16/02/2010



Rainer Winter
Final approval
Essen, 23/02/2010

Annex 1

5. Terms and definition

CAR	Corrective Action Request
CEA	Central Electricity Authority
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CTPT	Current Transformer and Potential Transformer
CR	Clarification Request
ER	Emission Reduction
GHG	Greenhouse gas(es)
ISO	International Standardisation Organisation
kWh	Kilowatt hour
MR	Monitoring Report
MP	Monitoring Plan

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MW	Megawatt
MWh	Megawatt Hours
MPSEB	Madhya Pradesh State Electricity Board
PP	Project Participant
QA/QC	Quality Assurance / Quality Control
RSIL	Ruchi Soya Industries Limited
VCU	Voluntary Carbon Units
VER	Voluntary Emission Reduction

Annex 2

References

Table 6-1: Documents provided by the project proponent

Reference	Document
/ADD/	Documents required for serious consideration of CDM 1. Offer letters for WTGs dated 08/08/2007 2. WTG Commissioning letter for project 3. Loan application 4. Quotation and Purchase Order for each component of project cost dated 20/11/2007 5. O&M agreement 6. FCCB issue document 7. PPA dated 11/08/2008

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Reference	Document
	8. Approaching to the CDM consultant dated 04/10/2007 9. NOC from SEB 10. Appointment of validator dated 11. PNB letter refusing to lend for the wind power project without CDM revenue as IRR is low 12. Getting loan at 1% lower than the BPLR with 6 years maturity including 1 year moratorium (forming the basis of projections) 13. Project cost break up 14. Insurance premium payment 15. Loan sanction letter
/CAL/	Calibration certificates of all the meters installed at the project site specific to the project activity.
/CS/	Commissioning certificate of all the individual WTGs
/GEN/	Spreadsheet for historical electricity generation from the project activity.
/IRR/	IRR calculation spread sheet
/LSHC/	Proof of local stake holders consultation process • Minutes of Public hearing • List of Participants • Extract of feedback from local stakeholders.
/MD/	Extract of the board meeting dated 30/09/2007
/PPA/	Power purchase Agreements between RSIL with the grid operators dated 11/08/2008
/PLF/	Proof of plant load factor by third party as per annex11 EB48
/PT/	Proof of title for the project activity (Cp section 8.1 of the VCS PD template)

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Reference	Document
/RD/	Declarations by project proponents stating no intention of creating and trading of another form of environmental credits out of VERs would be created from this given project (Cp Para 1.13 of VCS PD template)
/SD/	Single line diagram describing all the metering points for all the WTGs related to the project activity.
/TS/	Technical specifications of wind turbine generators from manufacturers and electricity meters.
/VCSPD1/	VCS PD (Version1)on which the validation is carried out
/VCSPD2/	Revised VCS PD (Version 2)on which the validation opinion is given
/XLS/	1. Emission reduction calculation spreadsheet 2. Revised Emission reduction calculation sheet

Table 6-2: Background investigation and assessment documents

Reference	Document
/ACM0002/	Consolidated baseline methodology for grid-connected electricity generation from renewable sources version 10
/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

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	assessed by TUV NORD in accordance with Tool to determine emission factor, version 05
/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.1.1)
/ISO/	ISO 14064-2; ISO 14064-3, ISO 14065

Table 6-3: 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.	Vinay Shah	Vice President - RSIL

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Reference	MoI1		Name	Organisation / Function
		☐ Ms.		
/IM01/	V	☒ Mr. ☐ Ms.	Mukesh P. Rawal	DGM-Projet-RSIL

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