



*Voluntary Carbon Standard 2007.1*

## **VALIDATION REPORT**

**BUNDLED WIND POWER PROJECT**

# **Positive Climate Care 4.67 MW Bundled Grid connected Wind Power Project Activity in Jaisalmer, Rajasthan, India**

**Project No/ Rev. No.: V-3-I-01-B-0050/ 01**

Name of Validation company:	Date of issue:
Perry Johnson Registrars CDM Inc.	2009-11-16
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VCS Validation Report for “Positive Climate Care 4.67 MW Bundled Grid connected Wind Power Project Activity in Jaisalmer, Rajasthan, India”	S. V. Jamble
Client(s):	Project Title:
<ol style="list-style-type: none"> <li>1. Rajesh Construction Company Limited (formerly Rajesh Construction Co.)</li> <li>2. Savla Twisters Private Limited</li> <li>3. Vijay Industries Limited</li> <li>4. Saurabh Agrotech Private Limited</li> </ol>	PD – “Positive Climate Care 4.67 MW Bundled Grid connected Wind Power Project Activity in Jaisalmer, Rajasthan, India” Version : 02 Date : 2009-11-10
Summary:	
<p>The clients as listed above have commissioned Perry Johnson Registrars Clean Development Mechanism Inc. (PJRCDM) to perform validation of their bundled project – “Positive Climate Care 4.67 MW Bundled Grid connected Wind Power Project Activity in Jaisalmer, Rajasthan, India” under Voluntary Carbon Standard (VCS) 2007.1.</p> <p>The validation is an independent assessment to determine the conformance of the project activity to the requirements of VCS 2007.1, including applicable baseline methodology, demonstration of additionality, monitoring plan and the greenhouse gas (GHG) emission reduction potential.</p> <p>The project activity involves installation and operation of wind turbine generators (WTGs) of 4.67MW capacity in Jaisalmer district, Rajasthan, India. The machines were commissioned during the years 2003 and 2004 and the power generated is exported to the Northern Eastern Western North Eastern (NEWNE) grid regional grid of India.</p> <p>The project activity has correctly applied the AMS I D methodology version 14 and relevant tools from Clean Development Mechanism (CDM) to determine baseline, establish additionality and frame the monitoring plan.</p> <p>PJRCDM conducted a physical verification of the WTGs, interviewed representatives of the project proponents and carried out a review of relevant documents. A number of Clarification Requests (CLs) and Corrective Action Requests (CARs) were issued which were subsequently resolved by the project proponent.</p> <p>Total GHG emission reduction achievable by the project activity has been estimated at be 8,293 tonnes of CO<sub>2</sub>e per annum.</p> <p>Based on the documentation verified, it is PJRCDM’s opinion that the emission reductions from the project activity would be real, measurable, additional and permanent.</p>	
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Work carried out by:	Work reviewed by
Umashankar S.	S. V. Jamble

### ***Abbreviations***

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority, Ministry of Power, Government of India
CL	Clarification Request
FAR	Forward Action Request
GHG	Greenhouse gases
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
kWh	kilo watt-hour
MW	Mega Watt
NEWNE	Northern Eastern Western North Eastern (NEWNE) Grid of India
PD	Project Description (VCS)
PJRCDM	Perry Johnson Registrars Clean Development Mechanism Inc.
PLF	Plant Load Factor
PP	Project Proponent
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Voluntary Carbon Standard
VCU	Voluntary Carbon Unit
WTG	Wind Turbine Generator

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## **1 INTRODUCTION**

The clients as listed in the summary sheet above (hereinafter referred to individually or collectively as the ‘client’ or ‘project proponent’) have contracted Perry Johnson Registrars Clean Development Mechanism Inc. (PJRCDM) to perform validation of the bundled project “Positive Climate Care 4.67 MW Bundled Grid connected Wind Power Project Activity in Jaisalmer, Rajasthan, India”, (hereinafter referred to as the project/project activity) under the Voluntary Carbon Standard (VCS) 2007.1 standard. This report describes the validation work undertaken.

### **1.1 Objective**

The purpose of Validation is to perform an independent, third party assessment of whether the project activity conforms to the qualification criteria set out in the VCS 2007.1 standard to attain real, measurable, additional and permanent emission reductions.

The validation statement/opinion is a written assurance that the project complies with all the applicable VCS requirements and has the ability to generate the emission reductions stated over the project’s crediting period.

### **1.2 Scope and Criteria**

The validation scope includes an independent and objective review of the project’s VCS project description (PD). In particular, the specific objectives of the validation work involve:

- To verify that the project activity meets the requirements of VCS 2007.1 standard including additionality, proof of title and compliance with local laws
- To assess whether the baseline and monitoring plan are in conformance with the methodology applied from the VCS approved GHG program.
- To certify that the information presented are complete, consistent, transparent and free of omission or material error.

The information in the PD is reviewed against the criteria of VCS 2007.1 standard, the VCS program guidelines, and the applied CDM methodology - AMS I D, version 14. PJRCDM has performed the validation based on a risk based approach focusing mainly on the significant risks to meet the qualification criteria and the ability to generate Voluntary Carbon Units (VCUs).

The work carried out by PJRCDM is free from any conflict of interest.

### **1.3 VCS project Description**

The project activity involves installation and operation of wind turbine generators (WTGs or machines) totalling 4.67 MW capacity at Rajasthan state of India by the four project proponents combined. The power generated from the WTGs is exported to the Rajasthan State Electricity grid, which is inter-connected with the Northern Eastern Western North Eastern (NEWNE) grid network of India. The WTGs are expected to generate power with a plant load factor (PLF) of 22.37%. The commissioning dates and unique identification details of the machines are as under:

Project owner	WTG No. / Make	Nature of export to grid*	Capacity (MW)	Village/ Town	District/ State	Commissioning date
Rajesh Construction Company Limited (formerly Rajesh Construction Co.)	J-132/ Suzlon	Sale to grid	1.25	Akal	Jaisalmer/ Rajasthan	31 <sup>st</sup> October 2003
	J-137/ Suzlon	Sale to grid	1.25	Akal	Jaisalmer/ Rajasthan	
Savla Twisters Private Limited	J-224/ Suzlon	Sale to grid	1.25	Soda Mada	Jaisalmer/ Rajasthan	30 <sup>th</sup> April 2004
Vijay Industries Limited	VIKL-01/ Enercon	Wheeling	0.23	Themdarai village, near Gorera side	Jaisalmer/ Rajasthan	29 <sup>th</sup> March 2003
	VIKL-02/ Enercon		0.23		Jaisalmer/ Rajasthan	
Saurabh Agrotech Private Limited	SAPL-01/ Enercon	Wheeling	0.23	Themdarai village, near Hansuwal side	Jaisalmer/ Rajasthan	29 <sup>th</sup> March 2003
	SAPL-02/ Enercon		0.23		Jaisalmer/ Rajasthan	

\* Wheeling refers to using grid transmission network for captive consumption by paying a transmission charge

As mentioned in the table above, few of the machines in the bundle are selling the power generated to the grid, whereas remaining machines are wheeling through the grid. In effect, the project displaces equivalent amount of power from the grid connected power plants.

The geographical coordinates of location of the WTGs are as mentioned in the PD. The lifetime of the machines stated is 20 years.

## 1.4 Level of assurance

In line with VCS 2007.1 requirements and as per ISO 14064-3:2006 para A.2.3.2, a reasonable level of assurance is defined for the validation of the project.

This implies that, based on the process and procedures conducted, PJRCDM should state whether the information in the PD

- is materially correct and is a fair representation of the actual project details, and
- is prepared in accordance with VCS requirements and the applied CDM methodology for information pertaining to additionality, GHG quantification, monitoring and reporting.

The validation work is carried out as per this requirement and details are presented in the Validation statement in section 4 below.

## 2 METHODOLOGY

The project activity applies approved small scale CDM methodology AMS I D version 14 categorised under sectoral scope 1 'Energy Industries (renewable/non renewable sources)'. For validation, PJRCDM's approach involves broadly three steps:

1. Completeness check and desktop review of the project description (PD)
2. Onsite inspection, interview with project representatives and issuance of findings
3. Resolution of the findings followed by preparation of the validation report

The following team members from PJRCDM were involved in these steps:

Name	Role	Areas covered
Umashankar S.	Validator	Completeness check, desk top review, site visit, issuance and closure of findings, report preparation
S. V. Jamble	Technical Reviewer	Technical review

## 2.1 Review of Document

On receipt of the project description from the client, the completeness of information made available as per VCS2007.1 standard requirements is reviewed. A desktop review is further carried out to assess the following:

- the project details as per VCS PD template
- appropriateness of methodology applied
- compliance with relevant laws and regulations
- correctness of application of baseline and monitoring methodology
- demonstration of additionality
- monitoring plan
- stakeholder comments
- proof of title
- other external documents like grid emission factor, IPCC emission factor, etc. where applicable

A complete list of all documents reviewed is attached in Appendix-I of this report. The first version of the PD was received on 28<sup>th</sup> July 2009.

## 2.2 Follow-up Interviews

After reviewing the project documents, a site visit was carried out to Jaisalmer district, Rajasthan state, India on 30<sup>th</sup> July 2009 where the physical inspection was made to verify the project details. During the visit and the follow-up meeting, interviews were conducted with the following project representatives:

Name / Designation / Company	Interviewed on
Mr. Gaurav Jain/ Assistant Manager - Customer Relations / Suzlon (O&M contractor)	Project technical details, monitoring system, calibration practice and frequency
Mr. Pradeep Singh/ Site Incharge / Enercon India (O&M contractor)	Project technical details, monitoring system, calibration practice and frequency
Ms. Meenakshi Jain/ CDM Consultant/ Positive Climate Care	Baseline, additionality and emission reduction calculations

During the site visit, PJRCDM verified the actual operation of the project as described in the PD. The system of metering used for monitoring the export to grid and the calibration practice adopted were examined. The monthly records system of energy meter readings was also reviewed.

### **2.3 Resolution of any material discrepancy**

Based on the site inspection and review of documents including the monitoring plan, issues that need to be further elaborated upon, researched or added in order that the project activity meets the VCS 2007.1 requirements and can achieve credible emission reductions is identified, clarified and to be resolved by the project proponent. A Corrective Action Request (CAR) is raised if one of the following occurs:

- a. The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
- b. The VCS 2007.1 standard requirements, including the specific requirements of the methodology applied, have not been met;
- c. There is a risk that emission reductions cannot be monitored or calculated

If information made available is insufficient or not clear/ transparent enough to determine whether the applicable VCS requirements have been met, a Clarification request (CL) is raised and communicated to the project proponent.

Observations may also be raised which are for the benefit of future verification period- called as Forward Action Requests (FARs). These, however, have no impact upon the completion of the current validation activity.

On receipt of response and revised PD from the project proponent, the adequacy of compliance with VCS and the methodology requirements is checked. Closure of comments raised occurs only if the response provided and corrections made fully comply with the stated requirements of the VCS2007.1 standard and the methodology applied.

The list of CARs/ CLs/ FARs raised and the response provided, the means of validation, reasons for their closure, and references to correction in the PD are provided Appendix-II to this report.

*Summary of major findings:* Among the major findings during validation, it was found that the WTG J-224 of Savla Twisters is currently under CDM validation. CAR#4 was raised to transparently declare the application to other GHG programs and how avoidance of double counting is ensured. The revised PD states that WTG J-224 of Savla Twisters is currently under CDM validation. Further, the proponents Rajesh Construction and Savla Twisters have applied for Chicago Climate Exchange (CCX) for the period prior to the VCS crediting period start date of 1<sup>st</sup> April 2006. Declaration letters have been furnished by each of the project proponents stating avoidance of double counting during the VCS crediting period from 1<sup>st</sup> April 2006 to 31<sup>st</sup> March 2016 and hence the issue was resolved. The PD had applied investment analysis route with individual Internal Rate of Return (IRR) to demonstrate the additionality of the project. The project IRR was compared with Weighted Average

Cost of Capital (WACC) as benchmark for individual proponents. Since the basis for WACC was not clear as per time of investment, CAR#6 was raised and later resolved. The revised WACC and IRR computations are based on time of investment (prior to purchase order) as December 2002 for Vijay Industries/ Saurabh Agrotech, July 2003 for Rajesh Construction and December 2003 for Savla Twisters. Further, as the input assumptions related to capital cost, tariff, plant load factor and operating costs were not substantiated adequately, these were sought under CAR#5 and subsequently resolved. Details of assumptions and their sources have now been discussed in the revised version#2 of the PD along with the sensitivity analysis.

The revised PD with changes incorporated as per the issues raised were rechecked with the documentary evidences and found to be in order.

### **3 VALIDATION FINDINGS**

#### **3.1 Project Design**

The VCS project activity involves installation and operation of wind turbine generators with total capacity of 4.67 MW at Jaisalmer district of Rajasthan state, India. Details of unique identification and commissioning dates are as provided in section 1.3 of this report. An estimated 9.15 Million kWh/ year is expected to be exported to the country's Northern Eastern Western North Eastern (NEWNE) grid. Plant Load Factor stated was 22.37% and CL#2 was raised to justify the assumption. This was found as per the Government of Rajasthan state renewable energy policy tariff order dated April 2003 and hence subsequently resolved.

Version 1 of the PD stated crediting period start date as the commissioning date the respective machines in the bundle. CAR#3 was raised to correct this as per VCS 2007.1 standard. The start date of the project has been stated as the commissioning date of the first WTG, i.e. 29<sup>th</sup> March 2003 in the revised PD. The VCS crediting period for the project is 10 years fixed from 1<sup>st</sup> April 2006 to 31<sup>st</sup> March 2016. Operational lifetime of the machines under the project has been defined as 20 years.

In line with the VCS requirements, proof of title of the proponents of the bundle was sought (CL#9). These were evidenced through ownership documents like purchase orders, commissioning certificates and power purchase agreements (see Appendix-I for document references) and hence resolved. Legal name change document of Rajesh Construction Company Limited from the earlier Rajesh Construction Co. was verified and found OK. Further, it was stated that an appropriate coordinating agency for the bundled project will be communicated to the VCS registry at the time of registration.

It was found that the machine J-224 of Savla Twisters is currently under CDM validation. To ensure that the environmental credits generated by the project are not double counted, CAR#4 was raised to transparently declare the status. As per the revised PD, the machine J-224 of Savla Twisters is found currently under validation. Further, the revised PD states that the machine of Savla Twisters and Rajesh Construction (J-132, J-137) have been found to have applied for Chicago Climate Exchange (CCX) till 31<sup>st</sup> March 2006 and 27<sup>th</sup> March 2006 respectively, which is prior to the start date of VCS crediting period from 1<sup>st</sup> April 2006. A declaration letter has also been separately furnished by each of the project proponent stating avoidance of double counting during the VCS crediting period. Hence, CAR#4 was closed.

Details of compliance with national and local laws and environmental regulations were sought in CL#3 and later resolved.

Lastly, as per VCS 2007.1, section 5.2.1 the schedule of complying with contracting deadline prior to 19 November 2008 for validation was sought (CAR#10) and later resolved.

### 3.2 Baseline and demonstration of additionality

The project proponent had applied approved baseline methodology AMS I.D., version 13 which has been approved by the CDM Executive Board. CAR#1 was raised to apply the latest approved version of the methodology and resolved. The total installed capacity of the bundle is 4.67 MW which is less than the 15 MW limit for type I small scale project activities. The application of baseline methodology is justified as follows:

- The project generates electricity using the renewable source i.e. wind energy.
- The total installed capacity of the project is less than 15 MW. The installed capacity has been verified from the commissioning certificates and power purchase agreements of the proponents.
- The grid boundary selected for the project activity is the NEWNE regional grid of India to which the project exports generated power. The selection is appropriate for a large country like India and is in line with CDM guidelines and the Tool to calculate the emission factor for an electricity system (Version 1.1). The project proponents have committed not to replace the technology during the crediting period.

Baseline for the project has been identified in line with the small scale methodology AMS ID version 14, where the baseline emissions are renewable energy generated times the emission factor of the grid. The grid emission factor has been determined as Option a, the combined margin grid emission factor of the NEWNE grid as 0.906 tCO<sub>2</sub>/ MWh in line with the 'Tool to calculate the emission factor for an electricity system' (Version 1.1).

**Additionality:** The additionality was demonstrated through the investment analysis route with individual IRR. The project compares project IRR with weighted average cost of capital (WACC) as benchmark as per the guidelines of the CDM Additionality Tool and the EB 'Guidance on the assessment of Investment Analysis'. As Vijay Industries and Saurabh Agrotech are group companies and have invested at the same time, a single IRR computation has been shown for the four 0.23 MW WTGs (VIKL-01, VIKL-02 and SAPL-01 and SAPL-02).

Since it was not clear on the basis of benchmark determined based on time of investment, CAR#6 was raised. The revised PD states that the cost of equity for Weighted Average Cost of Capital (WACC) was determined using the capital asset pricing model. The market return was verified from Bombay Stock Exchange 30 Sensex index from the base year 1979 to the time of investment (prior to purchase order date) of individual machines. The beta values were verified as the average of a set of listed power sector companies in India as considered from the Aswath Damodaran database as 0.926. The risk free return and lending rates were verified

from the Reserve Bank of India data for the corresponding years and found OK. The WACC was determined using the formula

$$WACC = [Portion\ of\ Debt] * [Cost\ of\ Debt * (1 - Tax\ rate)] + [Portion\ of\ Equity] * [Cost\ of\ Equity]$$

Due to combined benefit of accelerated depreciation and tax holiday of 10 years in the first 15 year of operation, the corporate tax is not applicable for 15 years of the 20 year lifetime of the machines. Hence, the applicable minimum alternate tax (MAT) for companies has been used as the tax rate in the WACC calculation and found reasonable. Rajesh Construction being a partnership firm and not a company, MAT has not applied.

Accordingly, WACC has been determined as 11.72% for Vijay Industries/ Saurabh Agrotech (period prior to investment December 2002), 11.99% for Rajesh Construction (period prior to investment July 2003) and 11.91% Savla Twisters (period prior to investment December 2003).

As the assumptions related to capital cost, debt:equity ratio, plant load factor (PLF) and tariff used for the IRR estimation were not justified adequately, CAR#5 was raised. The PLF has been found to be applied as per the prevailing Government of Rajasthan state renewable energy tariff policy order of 30<sup>th</sup> April 2003. For Vijay Industries Saurabh Agrotech a PLF of 18.5% was used as per the PLF for 2000-01 from the demonstration wind farm set up by Ministry of Non Conventional Energy Sources, Government of India at Jaisalmer. However, later the Government of Rajasthan came out with a higher PLF of 22.37% in its tariff order dated 30<sup>th</sup> April 2003, and the higher value was asked to be considered for conservativeness of IRR computation. Capital costs were verified from the purchase order for the WTGs. Debt equity ratio at 70:30, the O&M costs and sale to grid tariff applied were found as per Government of Rajasthan wind policy dated 30<sup>th</sup> April 2003. For Vijay Industries / Saurabh Agrotech the wheeling charges were verified as 2% from the prevailing Government of Rajasthan policy dated February 2000 and wheeling benefit was checked as per industrial high tension tariff invoices at the end user. Further, as Rajesh Construction Company Limited was a partnership firm at the time of investment, book depreciation and minimum alternate tax are not applicable as per Companies Act 1956, and the same was sought to be addressed through CAR#5. Details of assumptions with sources of information and changes as sought have been included in the revised PD and IRR spreadsheets. Hence, CAR#5 was closed.

The following assumptions have been verified and found reasonable for the IRR computation:

<b>Input Parameter</b>	<b>Value Applied</b>	<b>Source of information verified from</b>
Book depreciation under Companies Act	5.28%	Straight Line Method, Schedule XIV of Companies Act, 1956, item II (b) (not applicable to Rajesh Construction)
Accelerated Depreciation under IT Act	80%	Written Down Value (WDV) basis - Under Income Tax Act 1961
Minimum Alternate Tax (MAT)	7.5% for 2002-03 and 7.69% for 2003-04	Under Income Tax Act 1961 for the year (not applicable to Rajesh Construction)
Plant Load Factor	22.37%	Based on Rajasthan State Renewable energy policy dated 30 <sup>th</sup> April 2003

Regular Income Tax (with surcharge)	36.75% for 2002-03 and 35.87% for 2003-04	Under Income Tax Act 1961
Industrial High Tension Tariff Rate in Rajasthan	Rs.4.01 per kWh	Electricity purchase Invoice from industry
Escalation of Industrial High Tension Tariff	Rs. 0.05/ kWh/ year	-
Sale of power	Rs. 3.32 per kWh with base year 2003-04 and escalation of Rs. 0.06/ kWh as applicable for the year for 10 years and Rs. 3.92 after 10 <sup>th</sup> year	Based on Rajasthan State Renewable energy policy dated 30 <sup>th</sup> April 2003
Capital Cost for WTGs	As per actuals	Cross-checked with purchase orders (see Appendix-1 for details) Cost/ MW works out at Rs. 41.9 Million/ MW for Savla Twisters 1.25 MW machine, Rs. 47/ Million/MW for 2x1.25 MW Rajesh Construction machines and Rs.54.5 Million/ MW for the 4x0.23MW Vijay Industries/ Saurabh Construction machines, and is based on actuals.
Operation and Maintenance Cost	1.67% of project cost with escalation of 5% per year	Based on Rajasthan State Renewable energy policy dated 30 <sup>th</sup> April 2003
Interest Rate	11.0% for 2002-03 and 10.5% for 2003-04	Based on Reserve Bank of India prime lending rate data for the year
Wheeling Charges	2%	Based on Rajasthan State Renewable energy policy dated February 2000
Losses due to grid / machine availability	5%	Based on supplier offer and conditions as stated in purchase orders.

The results of the project IRR computation and applicable benchmark were found as follows:

Project owner	WTG No. / Make	Nature of export to grid*	Capacity (MW)	Time of investment	Applicable benchmark (WACC)	Project IRR (Without VCS) at base PLF	Project IRR (Without VCS) at +10% PLF (Sensitivity)
Rajesh Construction Company Limited (formerly Rajesh Construction Co.)	J-132/ Suzlon	Sale to grid	1.25	July 2003	11.99%	9.85%	11.45%
	J-137/ Suzlon	Sale to grid	1.25				
Savla Twisters Private Limited/	J-224/ Suzlon	Sale to grid	1.25	December 2003	11.91%	11.51%	13.34%
Vijay Industries Limited and Saurabh Agrotech Private Limited (same group companies)	VIKL - 01/ Enercon	Wheeling	0.23	December 2002	11.72%	9.68%	11.36%
	VIKL - 02/ Enercon		0.23				
	SAPL - 01/ Enercon	Wheeling	0.23				
	SAPL - 02/ Enercon		0.23				

The tariff for sale of power is fixed based on state regulatory commission orders and as reflected in the power purchase agreements, and the capital cost assumed is based on purchase orders, therefore the only major variables influencing IRR are identified as the plant load factor (PLF) and the wheeling tariff benefit. Sensitivity analysis for the 10% increase in wheeling tariff for Vijay Industries/ Saurabh Agrotech shows that the IRR does not cross the benchmark.

Sensitivity analysis for 10% higher PLF, as presented above, shows that the individual IRRs do not cross the benchmark for the machines, except for machine # J-224 of Savla Twisters. For this machine while the IRR crosses the benchmark when the PLF is increased by 10%, the likelihood of enhanced generation was checked and found that the probability of occurrence is low after verifying the actual PLF for the machine at site, which is around 18%. This verification was done against the historical monthly generation records for the machines and found reasonable. The supplementary check was carried out as per the provision in para 17 of the CDM EB 41 ‘Guidance on Assessment of Investment Analysis’ document and found in order.

Based on the above discussion, it is concluded that the investment in the project is not financially attractive as per the step 2 of CDM Tool for the demonstration and assessment of additionality’ Version 5.2 and the CDM EB 41 “Guidance on the Assessment of Investment Analysis”. In addition, evidence related to technology barrier of the wind farms operating in desert conditions were checked and found in

order. It is thus concluded that the additionality of the project is adequately demonstrated and project is not the baseline scenario.

### **3.3 Monitoring Plan**

In line with the AMS ID methodology applied, the monitoring plan of the project involves monitoring of the net electricity sold to the grid by the wind machines.

During the site visit it was observed that the WTGs under the project activity are connected to a feeder with other machines not belonging to the project activity. Therefore, CAR# 7 was raised to transparently present the monitoring plan on how the accounting is done accurately for power exported from the machines in the project activity. This was elaborated in version 2 of the PD.

It was verified that the power export is based on the monthly joint meter reading made by the state electricity board personnel along with the Operations and Maintenance (O&M) contractor. The monitoring system consists of measuring energy generation at the individual wind turbine generator - by controller energy meters; and a joint meter at the substation end of the feeder where the power is exported to the grid.

The responsibility of quality assurance of the meter recording rests with the project proponents through its O&M contractors for individual WTG controllers. For the joint meters the responsibility lies with the state electricity transmission company. Frequency of monitoring is continuous, and the data is aggregated for a month. The data is archived on paper and electronically and the retention time for keeping of records is defined in the PD as two years beyond the crediting period.

The joint meters consist of main and check meters with 0.2% accuracy class. The calibration is done annually by the Rajasthan state electricity grid operator. The controller meters are digital meters with electronic self calibration to ensure continuous system diagnostics. CL#8 was raised to elaborate with evidence on these calibration practices and was subsequently closed after checking the adequacy.

Given that the net power exported are based on the third party billing in the form of joint meter readings, PJRCDM is of the opinion that it is reasonable to assume that the same will be reliable.

The grid emission factor has been determined ex-ante and is not monitored. As clarified in CAR#8, the ex-ante grid emission factor value will be used throughout the VCS crediting period.

### **3.4 Calculation of GHG Emissions**

The GHG source for baseline of the project has been chosen as CO<sub>2</sub> and no other sinks and/or reservoirs for either the baseline or project activity have been identified. This is justified as per the applicable methodology.

The baseline of the project activity is kWh produced by the renewable generating unit multiplied by an emission coefficient (kg CO<sub>2</sub>/kWh). The emission coefficient is the combined margin of the grid, calculated as a weighted average of operating margin (OM) and build margin (BM) according to the procedures prescribed in the 'Tool to calculate the emission factor for an electricity system' Version 1.1. The OM and BM emission factors have been sourced from the Central Electricity Authority (CEA) database version 04, dated September 2008. While OM has been calculated as average

of the years 2005-06, 2006-07 and 2007-08, the BM has been selected for the latest year 2007-08. For wind projects, weights of 0.75 and 0.25 have been applied as per the tool. The CEA data is an official source of Ministry of Power, Government of India and calculated in accordance with the ACM0002 methodology and the "Tool to Calculate the Emission Factor for an Electricity System", Version 1.1. PJRCMD confirms that grid emission factor 0.906 tCO<sub>2</sub>/MWh is in line with the latest CDM tool and guidelines.

In line with the methodology, the baseline emissions is determined as

$$BE_y = EG_y * EF_{CO_2}$$

where:

$BE_y$	Baseline Emissions in year $y$ ; tCO <sub>2</sub>
$EG_y$	Net Energy supplied to the grid in year $y$ ; kWh
$EF_{CO_2}$	Emission Factor of the grid in year $y$ ; kgCO <sub>2</sub> e/kWh

Further, emission reductions for the project have been calculated as:

$$\text{Emission reductions } (ER_y) = BE_y - PE_y - LE_y$$

where:

$ER_y$	Emission reductions in year $y$ (tCO <sub>2</sub> e/y)
$BE_y$	Baseline Emissions in year $y$ (tCO <sub>2</sub> e/y)
$PE_y$	Project emissions in year $y$ (tCO <sub>2</sub> /y)
$LE_y$	Leakage emissions in year $y$ (tCO <sub>2</sub> /y)

Since the bundled project is based on wind energy alone, no project emissions and leakage have been considered in accordance with the baseline methodology AMS ID, version 14. Hence, the final emission reductions resulting from the project is equivalent to the baseline emissions.

Thus, Emission reductions ( $ER_y$ ) =  $BE_y$

The bundled project is expected to sell net electricity of 9.15 Million kWh/ year. The GHG emission reduction accruable from the project activity has therefore been estimated as 8,293 tCO<sub>2</sub> equivalent per year.

### 3.5 Environmental Impact

The project activity is a renewable energy project with a cumulative capacity of 4.67 MW of WTGs being implemented in Jaisalmer district of Rajasthan state, India. CL#3 was raised for further elaboration on environmental and legal compliance. The project being a wind energy project does not warrant any environmental impact assessment or environmental permits as per the notification S.O. 60 (E) dated 27<sup>th</sup> January 1994 in India. However, the project proponents need to obtain clearance from the Rajasthan state electricity renewable energy development agency prior to setting up of the machines and signing of the power purchase agreement. PJRCMD was able to verify the projects compliance with local laws and regulation with these documents (see Appendix-I for details). Environmental impact of the project is found insignificant.



### **3.6 Comments by stakeholders**

VCS 2007.1 requires discussion on relevant outcomes from stakeholder consultations and mechanisms for on-going communication for the project activity. CAR#9 was raised for providing complete details with evidences of the stakeholder meeting. Stakeholders' meetings were organized by the project proponents Rajesh Construction and Savla Twisters at Suzlon O&M site office on 21<sup>st</sup> August 2009. Project proponents Vijay Industries and Saurabh Agrotech organised the meeting at Enercon site office in Jaisalmer, Rajasthan, India on 5<sup>th</sup> September 2009. The identified stakeholders for the meetings were the local villagers, representatives of the project proponents and the employees of O&M contractors. The details of the stakeholder meetings have been included in version 2 PD. The information provided was cross checked with the evidences (see Appendix-I for details) and found in order.

No negative comments have been received for the project activity.

## 4 VALIDATION CONCLUSION

PJRCDM Inc. has performed the validation of the project 'Positive Climate Care 4.67 MW Bundled Grid connected Wind Power Project Activity in Jaisalmer, Rajasthan, India'. The validation was carried out to independently assess whether the project conforms to the qualification criteria and requirements of Voluntary Carbon Standard (VCS) 2007.1, including the baseline and monitoring methodology applied. The VCS Program provides the standards and framework for independent validation based on ISO 14064-2:2006 and ISO14064-3:2006 standards.

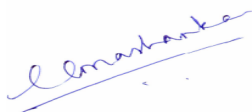
PJRCDM's approach is risk-based, drawing on an understanding of the risks associated with the meeting of VCS 2007.1 standard requirements. The assessment was based on the review of project description (PD), supporting evidences, site interview, including other explanations where necessary to enable PJRCDM to provide reasonable assurance that the information reported in the PD is complete and materially correct. Our scope and conclusion is thus limited to the above evaluation.

The project involves sale of electricity from wind turbine generators with total capacity of 4.67MW to the grid, thereby displacing grid power. The VCS approved CDM baseline and monitoring methodology AMS I D, version 14 has been correctly applied to determine the baseline and the emission reductions.

In our opinion, it is sufficiently demonstrated that the project is not the baseline scenario and emission reductions resulting from the project activity are real, permanent and are additional to what would have occurred in the absence of VCS project activity. Further, the monitoring plan makes adequate provision for ensuring transparency and accuracy during project monitoring.

The total GHG emission reduction achievable from the project is estimated at 8293 tonnes of CO<sub>2</sub> equivalent per year over the 10 year crediting period starting from 1<sup>st</sup> April 2006. This estimate is fair given that the underlying assumptions do not change.

To summarize, it is PJRCDM's opinion that the project as described in the version 02 of the VCS PD 'Positive Climate Care 4.67 MW Bundled Grid connected Wind Power Project Activity in Jaisalmer, Rajasthan, India' dated 10<sup>th</sup> November 2009 meets the VCS 2007.1 requirements and correctly applies the baseline and monitoring methodology AMS-I.D, version 14.



Project Manager  
PJRCDM



Site Program Manager  
PJRCDM

## **APPENDIX I: DOCUMENTS REVIEWED**

### **A. Key documents**

1. VCS Project Description (PD) Version 1 dated 28<sup>th</sup> July 2009
2. PD Version 2 dated 10<sup>th</sup> November 2009
3. VCS 2007.1 Standard, Program Guidelines and the Registration and Issuance Guidance Document
4. CDM approved small scale methodology, AMS I D Version 14
5. CEA grid emission factor database, version 04, September 2008
6. Individual Internal rate of return calculation sheets of the project proponents
7. Emission Reduction calculation of the project

### **B. Project related supporting documents**

1. Purchase order of WTG(s) between
  - Rajesh Construction Company and Suzlon Energy Ltd. on 28th August 2003.
  - Saurabh Agrotech Pvt. Ltd. and Enercon (India) Ltd. on 30th December 2002.
  - Vijay Industries and Enercon (India) Ltd. on 30th December 2002.
  - Savla Twisters Pvt. Ltd. and Suzlon Energy Ltd. on 1st January 2004.
2. Work order for Erection & Commissioning between
  - Rajesh Construction Company and Suzlon Developers Pvt. Ltd. on 28th August 2003.
  - Saurabh Agrotech Pvt. Ltd. and Enercon (India) Ltd. on 30th December 2002.
  - Vijay Industries and Enercon (India) Ltd. on 30th December 2002.
  - Savla Twisters Pvt. Ltd. and Suzlon Developers Pvt. Ltd. on 1st January 2004
3. Wheeling Agreement between
  - Saurabh Agrotech Pvt. Ltd. and Rajasthan Rajya Vidyut Prasaran Nigam Ltd. (RRVPNL) on 19th March 2003
  - Vijay Industries and Rajasthan Rajya Vidyut Prasaran Nigam Ltd. on 19th March 2003
4. Power Purchase Agreement between
  - Rajesh Construction Company and Rajasthan Rajya Vidyut Prasaran Nigam Ltd. on 10th October 2003.
  - Savla Twisters Pvt. Ltd. and Rajasthan Rajya Vidyut Prasaran Nigam Ltd. on 19th February 2004.
5. Commissioning Certificate for WTG(s) of
  - Rajesh Construction Company issued by Jodhpur Vidyut Vitaran Nigam Limited (JVVNL), letter dated 31st October 2003.
  - Saurabh Agrotech Pvt. Ltd. issued by JVVNL, letter dated 29th March 2003.
  - Vijay Industries issued by JVVNL, letter dated 29th March 2003.
  - Savla Twisters Pvt. Ltd. issued by RRVPNL, letter dated 30th April 2004

6. Clearance certificates of
  - Rajesh Construction Company from Rajasthan Renewable Energy Corporation Ltd., dated 14th December 2004.
  - Savla Twisters Pvt. Ltd. from Rajasthan Renewable Energy Corporation Ltd., dated 16th February 2004
  - Vijay Industries issued by Government of Rajasthan, dated. 26<sup>th</sup> February 2003
  - Savla Twisters Pvt. Ltd. issued by Government of Rajasthan, dated. 26<sup>th</sup> February 2003
7. Reserve Bank of India Prime Lending Rate data  
[http://rbidocs.rbi.org.in/rdocs/Publications/PDFs/74T\\_HB150909.pdf](http://rbidocs.rbi.org.in/rdocs/Publications/PDFs/74T_HB150909.pdf)
8. Reserve Bank of India Risk free return data  
<http://rbidocs.rbi.org.in/rdocs/AnnualReport/PDFs/65526.pdf>
9. The Companies Act, 1956 India SCHEDULE XIV (section 205) - Rates of depreciation
10. Section 80 IA of the Income Tax Act 1961
11. Government of Rajasthan renewable energy tariff policy orders - 4<sup>th</sup> February 2000 and 30<sup>th</sup> April 2003.
12. Documents related to stakeholder meeting discussions, dated 21<sup>st</sup> August 2009 and 5<sup>th</sup> September 2009

**APPENDIX- II: Resolution of Corrective Action and Clarification Requests**

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
<p><b>CAR 1</b> Version number of the approved methodology applied needs to reflect the latest version available from the VCS approved GHG program.</p>	<p>1.2</p>	<p>The latest version of methodology AMS I D available for small-scale CDM project at UNFCCC website under Appendix B of the simplified modalities and procedures: AMS ID/ version 14, valid from 31<sup>st</sup> July 2009 has been used in revised version of PD.</p>	<p>Version 14 of the AMS I D methodology applied in revised PD. CAR closed.</p>
<p><b>CAR 2</b> Emission reductions estimate provided needs to be corrected as per the start date of the project’s crediting period.</p>	<p>1.3, 4.4</p>	<p>Calendar dates have been specified in Emission reduction table and other necessary changes have been carried out as per approved methodology standard terms in the revised PD.</p>	<p>The crediting period is stated as 1<sup>st</sup> April 2006 to 31<sup>st</sup> March 2016 and accordingly emission reductions’ estimates have been stated. CAR closed.</p>
<p><b>CAR 3</b> As per VCS 2007.1 standard, the start date of a project activity can only be a single date.</p>	<p>1.6</p>	<p>As per VCS 2007.1, the project start date (commissioning) shall not be before 1<sup>st</sup> January, 2002. The first WTG of the project activity was commissioned on 29<sup>th</sup> March 2003 which is also the start date of the present project activity.</p>	<p>The VCS start date of the project is stated as 29<sup>th</sup> March 2003, the commissioning of the first set WTGs in the bundle. CAR closed.</p>
<p><b>CL 1</b> Further elaboration is sought on the conditions prior to the project initiation</p>	<p>1.7</p>	<p>As clearly stated in section 2.4 of PD, Electricity in Rajasthan which is the part of NEWNE grid, is mainly generated from the fossil fuel dominated power plants. In the absence of the project activity, equivalent amount of</p>	<p>All the machines in the bundle are checked and found as new installations. CL</p>

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Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
as per the VCS requirement.		<p>electricity would have been generated by the operation of these conventional fuel dominated power plants. The electricity grid is power deficit and hence the new capacity has to be added in the grid system which would be fossil fuel dominated electricity generation.</p> <p>The land on which the current project activity took place was barren and the WTGs installed are all new installations.</p>	closed.
<p><b>CL 2</b></p> <p>Further detail is sought on the power evacuation system implemented as part of the project activity.</p> <p>Source of data for the Plant Load factor (PLF) mentioned is not clearly evidenced.</p>	1.9	<p>Details about Power evacuation system implemented as part of the project activity have been mentioned in revised PD.</p> <p>The PLF 22.37% has been assumed as per RERC wind power policy April 2003 prevailing at the time of investment.</p> <p>For Vijay Industries/ Saurabh Agrotech - As per wind power policy 2000, Government of Rajasthan with the help of MNES set up a 2 MW wind Demonstration Farm at Amarsagar, Jaisalmer. For the year 2000-01, plant load factor from this wind farm was stated at 18.5%. However, PPs assumed the higher PLF of 22.37% as per RERC wind power policy April 2003 for conservativeness. And the same has been assumed for investment analysis.</p>	<p>Details of Power evacuation have been included in the revised PD. PLF has been verified as per Government of Rajasthan tariff order dated April 2003. Justification for PLF considered for Vijay Industries/ Saurabh Agrotech is also found adequate. CL closed.</p>

**VCS VALIDATION REPORT**



Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
<p><b>CL 3</b> Status on applicable Forest and Environmental clearance needs to be clearly stated where compliance with relevant local laws and regulations is discussed.</p>	<p>1.10, 4.0 and 5.0</p>	<p>PPs have installed the Greenfield project activity at a location which is not under forest land.</p> <p>According to Indian regulation, the implementation of the wind park does not require any environmental clearance. However, necessary clearance taken from state power renewable energy nodal agency to commission and execute wind power project has been provided to validator and the same has been given with reference number in relevant section of the PD.</p>	<p>Clearances from Rajasthan Renewable Energy Corporation are verified and found in order. CL closed.</p>
<p><b>CL 4</b> Further elaboration is required on risks that effect project's emission reductions.</p>	<p>1.11</p>	<p>As wind power generation is dependent on many factors like machine availability, grid availability, wind availability, climatic factors etc., the capacity utilized is less than best case scenario. Even though wind farm developers promise about 20-25% of PLF per WTG during a year, this much generation is always questionable. PLF depends upon the availability of the wind and is not under the control of supplier or owner of the WEGs. Hence, there is always a chance for fluctuation in PLF which would affect the production of electricity and in turn the associated returns from the wind farm.</p>	<p>Details of project risks have been included in the revised PD. CL closed.</p>

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Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
<p><b>CAR 4</b></p> <p>It is found that the WTG of project proponent Savla Twisters (J 224) is currently under CDM validation. The status of application to other GHG programs to be provided.</p> <p>Clear statement is required from the project proponents that no double counting of emission reductions with any other GHG Program has/will take place during the VCS crediting period sought.</p>	<p>1.13</p>	<p>Project Proponent Rajesh Constructions has applied for registration under the Chicago Climate Exchange (CCX) since Date of Commissioning up to March 27<sup>th</sup>, 2006 and the Registration is awaited. The evidence for the same has been provided to Validator.</p> <p>Project Proponent, Savla Twisters has applied for Registration under CDM process and the project is currently in validation stage. The crediting period under VCS will last till the date of Registration of project under CDM. In past, Savla has got registration under the Chicago Climate Exchange (CCX) program since December 1<sup>st</sup>, 2004 up to March 31<sup>st</sup>, 2006. The evidence for the same has been provided to Validator.</p> <p>A letter of undertaking from all the Project Proponents have been provided to Validator, in which PP has declared that GHG reduction credit would be claim under only one GHG program for a crediting period to avoid double counting of GHG credits, in line with the VCS 2007.1 standard and, “Further Guidance for projects that are Registered in two GHG Programs” dated 19 March 2008 issued by VCS Association.</p>	<p>It is found that the WTG J-224 of Savla Twisters is currently under CDM validation. Further, proponents Savla Twisters and Rajesh Construction have applied for credits under Chicago Climate Exchange (CCX) for the period prior to the start date of crediting period under VCS of 1<sup>st</sup> April 2006. The same were verified. Letters of undertaking stating avoidance double counting during VCS crediting period were furnished by the individual proponents. CAR closed.</p>

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
<p><b>CL 5</b> Section 2.1 of PD needs to clearly state all relevant tools used along with the latest version of the approved methodology.</p>	<p>2.1</p>	<p>The latest version of methodology AMS ID available for small-scale CDM project at UNFCCC website under Appendix B of the simplified modalities and procedures: AMS ID/ version 14, valid from 31<sup>st</sup> July 2009 and Methodological Tool: “Tool to calculate the emission factor for an electricity system” version 01.1 has been used in revised version of PD which is in accordance with VCS 2007.1 standard.</p>	<p>The latest applicable version of CDM tools and methodology have been stated and applied. CL closed.</p>
<p><b>CL 6</b> The baseline scenario needs to be substantiated with adequate statistical data at the time of project implementation.</p>	<p>2.4</p>	<p>As per Ministry of Power data for the financial year 2002-03 the installed capacity of power utilities in the states located in Northern Region was 28452.56 MW. The total installed capacity comprised of Hydro 30.21%, Coal 54.37%, Diesel 0.05%, Natural Gas 11.16%, Nuclear 4.15% and wind only 0.057%.</p> <p>The present project activity lies in Rajasthan which is a part of NEWNE grid. At the time of project implementation, Rajasthan had energy (MU) shortages of 2.10% and peak (MW) shortages of 1.5% in 2002-03.</p>	<p>Details of statistics of grid mix prior to project start with sources of information have been included in the revised PD. CL closed.</p>
<p><b>CAR 5</b> Justify the following assumptions for the project IRR determined:</p> <ul style="list-style-type: none"> <li>The basis for plant load factor,</li> </ul>	<p>2.5</p>	<p>As per wind power policy 2000, Government of Rajasthan with the help of MNES set up a 2 MW wind Demonstration Farm at Jaisalmer. For the year 2000-01, the plant load factor from this wind farm arrived at 18.5%. However, PP Vijay Industries and Saurabh Agrotech (sister concerns) assumed the higher PLF of 22.37% as per Government of</p>	<p>PLF and O&amp;M costs were verified from the Government of Rajasthan wind policy dated April 2003. Justification for</p>

Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
<p>tariff and O&amp;M costs considered at the time of investment</p> <ul style="list-style-type: none"> <li>• Basis for Capital cost</li> <li>• Corporate Tax rate is not found relevant to the year of investment</li> <li>• Loan repayment period and moratorium period</li> </ul>		<p>Rajasthan wind power policy 2003 for conservativeness. And the same has been assumed for investment analysis. At the time of investment for PP Rajesh Constructions and Savla twisters, Government of Rajasthan wind power policy April 2003 was prevailing, therefore they assumed the plant load factor 22.37% for financial analysis. For wheeling benefit, industrial high tariff at Rs. 4.01/ kWh as per electricity invoice is considered along with escalation of Rs. 0.05/ kWh/ year.</p> <p>O &amp; M costs have been considered as 1.67% of project cost with 5% annual escalation as per Government of Rajasthan wind power policy April 2003.</p> <p>Capital costs have been considered as per the actual costs incurred in the project activity.</p> <p>As per income tax slab applicable for the year 2002-03 for PP Vijay industries and Saurabh Agrotech, Corporate tax 36.75% and for PP Rajesh Constructions and Savla twisters for the year 2003-04, Corporate tax 35.87% has been considered for financial analysis in the revised PD.</p> <p>Loan repayment has been considered as 7 years and moratorium period of 12 months as per standard lending</p>	<p>considering Vijay Industries/ Saurabh Agrotech also under this policy is found on the conservative side. Capital costs were verified from the purchase order for WTGs to the technology supplied and found OK. The corporate tax rates have been revised as per applicable year. CAR closed.</p>

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Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
<ul style="list-style-type: none"> <li>Justify how the depreciation rate and Minimum Alternate Tax is applicable as per Companies Act is applicable to partnership firms, i.e. for Rajesh Construction Co.</li> </ul>		<p>norms and Government of Rajasthan 2000 policy.</p> <ul style="list-style-type: none"> <li>Rajesh Constructions Company was a partnership firm at the time of investment. Hence depreciation rate as per Companies Act 1956 and Minimum Alternate Tax is not accounted in the revised PD and IRR sheets.</li> </ul>	
<p><b>CAR 6</b></p> <p>The project applies weighted average cost of capital as benchmark. Justification is sought on how WACC can be considered as benchmark for the project proponents.</p> <p>Further, the basis of determining the WACC based on time of investment is not clear.</p>	<p>2.5</p>	<p>As per the <b>Guidance on the Assessment of Investment Analysis, Version 02, EB 41, Annex 45, Local commercial lending rates or weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR.</b> As in the project activity, project IRR has been chosen as the financial indicator, Weighted Average Cost of Capital (WACC) is the suitable benchmark. Separate WACC calculations have been done for individual proponent. WACC has been calculated by taking into consideration cost of equity and cost of debt.</p> $WACC = [D / (D+E)] * [Cost of Debt * (1 - Tax rate)] + [E / (D+E)] * [Cost of Equity]$ <p>Where, the RBI bank prime lending rate prevailing at the time of project conceptualization for the reference year for</p>	<p>The Weighted Average Cost of Capital has been applied as per CDM EB Guidance on assessment of investment analysis. The cost of equity has been determined as per capital asset pricing model. The market return was checked from the Bombay Stock Exchange 30 Sensex</p>

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Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		<p>each PP has been considered as the cost of debt. (source: Reserve bank of India, Handbook of Statistics 2008-09, Table 74). And,</p> <p>The Cost of equity has been determined using the Capital Asset Pricing Model (CAPM). As per the model, Cost of Equity can be estimated as below –</p> $Re = Rf + \text{Beta} \times (\text{Market Return} - \text{Risk Free Return})$ <p>Where Rf = Risk- free rate of return</p> <p>Difference in BSE Sensex between since the year of inception of BSE Sensex, i.e. 1978-79 up to reference year for each PP has been taken to calculate the market return. (source: <a href="http://rbidocs.rbi.org.in/rdocs/AnnualReport/PDFs/72295.pdf">http://rbidocs.rbi.org.in/rdocs/AnnualReport/PDFs/72295.pdf</a>).</p> <p>The risk premium has been calculated as the difference in Market Return and Risk Free Return.</p> <p>The applicable Beta value has been determined on the basis of the average of Beta values of all electricity integrated companies in India which were listed on the namely Ahmedabad Electricity Company, BSES Limited, Gujarat INDS power company limited and Tata power company limited, in India which were listed on the Bombay Stock Exchange in India at the time of this investment. Beta values of individual companies have been sourced from Aswath Damodaran Data for the January 2003.</p> <p>The detailed calculations have been furnished in the</p>	<p>and beta values were verified as the average of set of listed power sector companies from the Aswath Damodaran database. Risk free return and lending rates were verified from the Reserve Bank of India data for the years. The basis of WACC determination based on time of investment has been elaborated in the revised PD and found reasonable.</p> <p>CAR closed.</p>

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Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
		benchmark spreadsheet submitted to validator and also stated in the revised PD.	
<p><b>CL 7</b> Further justification is sought on the technological barrier and as to how it could affect the project's expected operation.</p>	2.5	<p>The project location being a desert, it has very hot and dusty climate. Sandy storms, hot climatic harsh conditions are very frequent in the region. Dust increases wear and tear on machinery which requires more maintenance and ultimately burden on investors in the form of maintenance cost.</p> <p>As per trouble shooting Manual prepared for Jaisalmer site (a copy has been provided to validator), at high temperature conditions, nacelle cooling fan becomes the most critical component for wind turbine as it is operated once the temperature rises in the vicinity of over and above 25° C. Given that the Conditions at the Jaisalmer site are predominantly hot during the peak summer season (May-September), the criticality of running condition of cooling fan comes into importance. Even if it stops for an hour, site people have to attend the machine immediately. With growing dust on the surface of blades, wind turbines may lead among others to long time stops due to heavy accumulated dust and Safety demands, decreased power production and increased maintenance costs.</p>	<p>Evidences of technical barrier were verified from the technology supplier documents. CL closed.</p>

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Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
<p><b>CAR 7</b> During the site visit, it was found that the monitoring system in the PD did not completely and accurately reflect the actual monitoring system on site</p>	<p>3.2 and 3.4</p>	<p>The monitoring system of the site involves monthly joint meter reading reports of connecting WTGs which include the export and import electricity data from the main meter and controller at WTG end. These measurements are carried out by O&amp; M contractor and officials of the state power utility. Electricity Generation at WTG is measured and as reported in the joint meter reading reports signed by representatives of state electricity board. Calibration of meters, frequency and detailed monitoring plan is described in revised version of PD.</p>	<p>Details of monitoring plan as per site practices have been included in the revised PD. CAR closed.</p>
<p><b>CL 8</b> In line with the monitoring requirements of the VCS2007.1 standard as per ISO 14064-2:2006, more specific information is sought on the roles and responsibilities, the calibration procedure, uncertainty management and the method of archiving the data.</p>	<p>3.2 and 3.3</p>	<p>Responsibility for monitoring of project activity lies with PPs. To ensure trouble free operations and efficient generations through all the wind turbines, PPs have entered into a comprehensive Operation and Maintenance agreement with the EPC contractors for a period of 10 years. Contractors are responsible for the operation and maintenance of the project activity for the entire crediting period. Controller meters are for electronic meters used for continuous monitoring and are based on self calibration. Evidence for the controller calibration from Suzlon is provided to validator. Detailed calibration procedure, method of archiving data, sealing and maintenance of joint meters have been described in detail in revised version of PD.</p>	<p>Details of roles and responsibilities and calibration frequency have been included in the revised PD. CL closed.</p>

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Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
<p><b>CAR 8</b> The monitoring table for the baseline emission factor together with details on whether ex-ante or ex-post baseline emission factor will be applied is not clearly stated in the PD</p>	<p>2.8</p>	<p>The monitoring table has been suitably modified in section 3.3 of the revised version of the PD. The baseline emission factor is based on ex ante basis for the entire duration of crediting period.</p>	<p>The grid emission is to be applied ex-ante throughout the crediting period. CAR closed.</p>
<p><b>CAR 9</b> The details of stakeholder comments , the means for invitation, the method of taking into account the comments received and mechanism for ongoing communication are not clearly stated in the PD.</p>	<p>6.0</p>	<p>PPs Rajesh Constructions and Savla Twisters organized a stakeholder consultation meeting with the local villagers on 21<sup>st</sup> August 2009 to inform them on the environmental and social impacts of the project activity and discuss their concerns regarding the project activity. The Local Stakeholders were intimated of the stakeholder consultation on 04.08.2009 by Public Notice and on 08.08.2009 by Newspaper Advertisement to Local Stakeholders. PPs Vijay Industries and Saurabh Agrotech Pvt. Ltd organized a stakeholder consultation meeting with the local villagers on 5<sup>th</sup> September 2009 to discuss their concerns regarding the project activity. The Local Stakeholders were intimated of the stakeholder consultation by personal invitations. Minutes of meeting, Photographs and attendance sheet has been enclosed in revised version of PD.</p>	<p>Stakeholder meetings were organized in August / September 2009. Evidences for the same were checked and found OK. CAR closed.</p>
<p><b>CAR 10</b> Article 5.2.1 of the VCS2007.1</p>	<p>7.0</p>	<p>As stated in section 7 of PD, PPs entered into a validation contract with M/s Perry Johnson on 10<sup>th</sup> November 2008 (Rajesh Constructions and Savla Twisters) and 14<sup>th</sup></p>	<p>Details of the schedule have been included in the</p>

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Draft report clarification requests and corrective action requests by validation team	Ref. To the section of the PD	Summary of project owner response	Validation team conclusion
standard, the schedule of entering validation contracts prior to 19 November 2008 shall be provided.		November 2008 (Vijay Industries and Saurabh agrotech) The proof of the same has been provided to validator.	revised PD. CAR closed.
<b>CL 9</b> The list of documents stated for proof of title needs to be referenced for the specific official documents.	8.1	The list of documents like purchase orders, commissioning certificates and power purchase / wheeling agreements used to provide evidence for proof of title has been tabulated in PD and all mentioned references and documents have been provided to validator.	Proof of title documents were checked for individual proponents and found OK. CL closed.