Voluntary Carbon Standard 2007.1

VALIDATION REPORT

5.0 MW small scale wind based power generation for captive use by Balkrishna Industries Limited (BIL) in Rajasthan, India

Project No.: V-3-I-01-S-0027

Version No.: 01

Name of Validation company:	Date of issue:
Perry Johnson Registrars CDM Inc.	2009-11- 18
Report Title:	**Approved by:**
VCS validation report "5.0 MW small scale wind based power generation for captive use by Balkrishna Industries Limited (BIL) in Rajasthan, India."	S. V Jamble
Client:	**Project Title:**
M/s Balkrishna Industries Ltd	*"5.0 MW small scale wind based power generation for captive use by Balkrishna Industries Limited (BIL) in Rajasthan, India."*

Summary:

M/s Balkrishna Industries Ltd. Pvt Ltd have contracted Perry Johnson Registrars Clean Development Mechanism Inc. (PJRCDM) to perform validation of the project – *"5.0 MW small scale wind based power generation for captive use by Balkrishna Industries Limited (BIL) in Rajasthan, India"* under Voluntary Carbon Standard (VCS) 2007.1. 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.

The project activity involves installation and operation of fours (4) wind turbine generators (WTGs) of 4 x 1.25 MW capacity at Rajasthan. The power generated from the project activity is sold to the Northern Eastern Western North Eastern (NEWNE) grid of India.

The project activity has applied the tools of Clean Development Mechanism (CDM), the flexible mechanism under the United Nations Framework Convention on Climate Change (UNFCCC) and one of the VCS 2007.1 approved GHG Programs. The applied methodology is version 13 of AMS-I.D., Type I, Renewable Energy Projects, category I.D., *Grid Connected Renewable Electricity Generation*.

PJR CDM conducted a physical verification of the WTGs, interviewed project proponents and concerned persons and carried out a review of submitted documents. A list of Clarification Requests (CLs), Corrective Action Requests (CARs) and Forward Action Requests (FARs) was issued and were closed by the project proponents.

Total emission reductions achievable by the project activity have been estimated to be 8,059 tonnes of CO_2 equivalent per annum.

Based on the documentation verified, it is PJR CDM's opinion that the emission reductions from the project activity under consideration would be real, measurable, additional and permanent.

Project No. / Version No.	Number of pages
V-3-I-01-S-0027 /01	32
Work carried out by:	**Work reviewed by**
Mathsy Kutty	Anjana Sharma

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
GEDA	Gujarat Energy Development Agency
GEB	Gujarat Electricity Board
GUVNL	Gujarat Urja Vikas Nigam Limited
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
RBI	Reserve Bank of India
RRVPNL	Rajasthan Rajya Vidyut Prasaran Nigam Limited
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

Balkrishna Industries Ltd. Pvt Ltd, the project developer, (hereinafter referred to as the "client" or "project proponent") have contracted Perry Johnson Registrars Clean Development Mechanism Inc. (PJRCDM) to perform validation of the project "*5.0 MW small scale wind based power generation for captive use by Balkrishna Industries Limited (BIL) in 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 simplified baseline and monitoring CDM methodology AMS ID version 13. 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 is generation of electricity by wind turbine generators and exporting the generated electricity to the North East West North Eastern (NEWNE) regional grid of India. The project activity comprises of 4 WTGs owned by M/s Balkrishna Industries Ltd. Pvt Ltd installed in the Mada village, Jaisalmer district of Rajasthan, India.

Sr.No.	*WTG*	*Location number*	*Latitude*	*Longitude*
1	**J-270**	Khasara No. 186/P1;	26° 39' 57.1" N	70° 51' 45.2" E
2	**J-275**	Khasara No.187/P2,	26° 39' 48.1" N	70° 51' 21.9" E
3	**J-276**	Khasara No. 187/P1, 188/P1;	26° 39' 37.9" N	70° 51' 21.3" E
4	**J-280**	Khasara No. 202/P1;	26° 39' 38.6" N	70° 50' 59.42" E

The WTGs installed under the project activity have been supplied by M/s Suzlon Energy Ltd of 1.25 MW (4 numbers). The project activity has a total installed capacity of 5.00 MW, as confirmed against the commissioning certificate for the WTGs from Rajasthan Rajya Vidyut Prasaran Nigam Limited (RRVPNL), vide letter dated 31st December 2004. The project is expected to result in a net electricity generation of 8,879.9 MWh per annum. This has been arrived at by the project developer based on the plant load factor of 22.37% as suggested by the RERC order dated 29th September 2006, which makes reference to the assumptions that were used in the Government of Rajasthan Policy, October 2004 [18]. The electricity generated is wheeled using the transmission lines of the Rajasthan Electricity Board.

The lifetime of the machines stated is 20 years. PJRCDM was able to confirm the same against the technical specification of the WTG declared by the manufacturer, M/s. Suzlon Energy Ltd.

1.4 Level of assurance

In line with VCS 2007.1 requirements and as per ISO 14064-3:2006 paragraph 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 13) categorised under sectoral scope 1 'Energy Industries (renewable/non renewable sources)' for which PJRCDM has been accredited to carry out both validation and verification activities. For validation, PJRCDM's approach involves broadly three steps:

Completeness check and desktop review of the project description (PD)

Onsite inspection, interview with project representatives and issuance of findings

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
Mathsy K	CDM validator	Desk review, Draft report and final report preparation.
T Krishna	GHG auditor	Site visit
Anjana Sharma	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 section 5 of this report.

2.2 Follow-up Interviews

The site visit had been conducted on 23rd August 2009 representatives of PJRCDM visited the project site to resolve the issues identified during the desktop review.

The following personnel were interviewed on the denoted topics:

Name / Company	Topics of Interview
Gauruv Jain Customer Relation Manager, Suzlon Energy Limited	Monitoring system Metering, Calibration procedures and Recording system

During the site visit, PJRCDM verified the actual operation of the project as described in the PD. The system of controller energy meters and joint energy meters used for monitoring the sale of electricity sale to grid were examined. The monthly records for joint meter readings were reviewed.

2.3 Resolution of any material discrepancy

Based on the site inspection and review of documents and records 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, discussed 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.

3 VALIDATION FINDINGS

3.1 Project Design

a) Project design/Technology used:

The project activity involves the development and operation of grid connected wind based electricity generation facilities with aggregate installed capacity of 5 MW capacity located at Mada village, Jaisalmer district in the state of Rajasthan. The project activity involves installation of four (4) WTG's supplied by Suzlon Energy Ltd, of S-66 make of 1.25 MW capacity each. The project is expected to result in a net electricity generation of 8,879.9 MWh per annum. This has been arrived at by the project developer based on the plant load factor of 22.37% as suggested by the RERC order dated 29th September 2006, which makes reference to the assumptions that were used in the Government of Rajasthan Policy, October 2004 [18]. The electricity generated is wheeled using the transmission lines of the Rajasthan Electricity Board.

b) Project duration, crediting time and project start date:

The project proponent has considered 29th December 2004 as project start date, the project start date which is the commissioning date of the four WTGs as confirmed by PJR CDM against the commissioning certificate issued by Rajasthan Rajya Vidyut Prasaran Nigam Limited (RRVPNL), vide letter dated 31st December 2004 [14]. The selected project start date is in line with the VCS policy guidance (VCS 2007.1) which says "the project start date is identified as the date when the project activity began reducing or removing GHG emission".

The project proponent has opted for a crediting period of 10 years starting from 28th March 2006. The selected crediting period is reasonable keeping in view VCS 2007.1 guidance for such projects.

Operational lifetime of the proposed project has been defined as 20 years.

c) Ownership:

Proof of title:

The project WTGs in the project activity have been installed and operated by M/s Balkrishna Industries Ltd. Pvt. Ltd., have been considered as project participant and hence, own the emission reductions resulting from the project under consideration. M/s Balkrishna Industries Ltd. Pvt Ltd provided the purchase order copies for the wind turbine placed to M/s Suzlon Energy Ltd., [11] as the proof of ownership of four (4) WTGs and same had been verified.

d) Double counting and whether the project participated in another emission trading programme:

The renewable energy credits (RECs) are still in the implementation phase and have not been availed by the project activity in question. In the event that such RECs are made available to the project activity, it has been confirmed by the PP that they would only claim either for the VCUs or the RECs. This would further be checked again during the verification period.

The project had applied under CDM program as a part of CDM project activity – "*10.35 MW small scale grid connected wind electricity generation project at Jaisalmer in Rajasthan*". However, the project proponent has clarified that he has withdrawn from this bundle as verified against the

"Termination of agreement" between Synergy Global which confirms that the PP has withdrawn from the CDM project activity [28].

e) *Project applicability to the VCS for projects rejected under other GHG programme (if applicable):*

The project has not been rejected under any other GHG programme

f) *Whether the project is eligible under the VCS:*

- The proposed project is a renewable electricity project. The project activity will generate greenhouse gas (GHG) emission reductions by avoiding CO_2 emissions from electricity generation by fossil fuel power plants connected to the grid. The project is also demonstrated to be additional compared with the business as usual scenario, hence, the project is anticipated to fulfil VCS conditions and qualify for carbon finance.
- In addition to above, the project meets the specific criteria set in 5.2.1 of VCS Standard and has contracted a validating entity on 10th November 2008 [15].

3.2 Baseline and demonstration of additionality

The project proponents have applied approved baseline methodology AMS-I.D., version 13 which has been approved under the CDM programme. The total installed capacity of the project activity is 5.0 MW which is less than the qualifying limit of 15 MW for type I small scale project activities. The application of baseline methodology is justified:

- The proposed 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 commissioning certificate RRVPNL [14].
- 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. The project proponents have committed not to increase the capacity or to replace the technology during the crediting period.

Baseline scenario for the proposed project has been identified in line with the baseline methodology. In the absence of project activity, same amount of electricity would have been generated by the NEWNE regional grid as per the current grid mix and expected future capacity expansions.

Additionality: Since the project activity applies the SSC methodology, AMS I.D, the project proponent used the "*Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities*" for the assessment and demonstration of additionality. The project proponent has carried out financial analysis and prevailing practice barrier in order to demonstrate the additionality for the project activity.

Approach selected:

Since the project activity generates revenue without sale of carbon credits and the alternative to the project does not involve investments, a benchmark analysis was selected to demonstrate the financial unattractiveness of the project compared to the benchmark.

Financial indicator: Post tax project IRR has been selected as the financial indicator.

Benchmark: The project activity has used the prime lending rate (PLR) as the benchmark for the project activity. This benchmark has been deemed conservative given that most of the banks in India lend at interest rates equal to or higher than the PLR. The benchmark PLR as prevalent at the start date of the project activity was found to be 10.25% as confirmed against the RBI annual report [20].

Input values used for the financial analysis:

Assessment period: The assessment period for the financial calculation of IRR has been considered at 20 years (lifetime of project activity) and is reasonable. PJRCDM was able to confirm the same against the technical specifications in the purchase agreement [21].

Salvage value: A salvage value of 5% of the total project cost been also considered for financial analysis at the end of the lifetime of project activity. This is deemed conservative since the same is in line with the Central Electricity Regulatory commission's guidances.

Wheeling Charges: As the electricity generated by the project activity is used for captive requirement, the wheeling charges of 10% of total electricity supplied to grid and the same has been verified in the agreement provided by the PP between PP and state electricity board dated 21st September 2004.

Tariff: The project proponent has considered the HT tariff for the project activity in evaluating the financials for the project activity. Owing to the wheeling arrangement between the PP and the state electricity board, the project developer enjoys benefits in terms of avoiding paying the HT tariff applicable to industries, in case of import of the same quantum of energy from the grid. PJR CDM was able to confirm the same against the RERC Order dated 24th March 2001.

The operation and maintenance cost (O&M) and yearly escalation has been considered in lien with the purchase order, which confirms that the O&M is free for the first 3 years and the same is charged at INR 1 million per WTG.

Investment cost: PJRCDM was able to confirm the total equipment cost against the purchase orders and the agreement for erection and commissioning placed with M/s Suzlon Energy Limited., by M/s Balkrishna Industries Ltd. Pvt Ltd., for the supply and erection of the WTG's.

Other parameters like depreciation, income tax, Minimum alternate Tax (MAT) have been considered taking into account the laws prevalent at the time of investment decision like the Income tax rules in India.

The calculations were provided in the spreadsheet and verified to be correct. The project IRR of the activity without revenues from carbon credits works out to be 7.7%. This is less than the benchmark of 10.25%.

Sensitivity analysis: To further demonstrate the robustness of the financial analysis, the project developer has also carried out the sensitivity analysis for the parameter PLF and tariff.

PLF: It is seen that even with 10% variations in PLF considered, the IRR for the project activity doesn't crosses the benchmark. Hence the PLF considered for the financial analysis is deemed reasonable.

Tariff: It needs to be brought out that the tariff for the project has been fixed on the basis of the agreement entered into by the project proponent with the State Electricity Board (SEBs) and furthermore, the same is governed by the Rajasthan Electricity regulatory commission's (GERC) tariff order [18]. Furthermore, it was noted that even on considering a 10% increase in the tariff, the IRR for the project does not cross the benchmark of 10.25%.

Operation and Maintenance cost: The same does not contribute to more than 20% of the revenue or the cost and hence has not been considered for the sensitivity analysis.

Investment cost: Since the investment cost used for the IRR analysis has been sourced from the purchase orders placed by the project proponents with the equipment supplier, it is highly unlikely that the same can be subject to change.

The above analysis clearly demonstrates that the project activity does not represent a financially attractive venture to the promoters. In conclusion, the assessment of the arguments presented above is deemed to sufficiently demonstrate that the project is not a likely alternative, and that emission reductions resulting from the project are additional.

3.3 Monitoring Plan

The project proponents have applied simplified approved methodology AMS-I.D., version 13 – ***Grid connected renewable electricity generation***, which has been approved under the CDM programme. The applicability of the same has been justified as already discussed under section 3.2 of the validation report.

The monitoring plan consists of monitoring the energy generated by the project activity as measured by the installed energy meters. These energy meters used for monitoring are electronic tri-vector meters which measure both the amount of electricity imported from and exported to the grid continuously. There are two set of meters; main meter and check meter at the wind farm's switchyard and at the sub-station. The final reading for the purposes of invoicing is taken from the meter at the sub-station, where the data is measured monthly in the presence of third party, State Electricity Board officials as a Joint Meter Reading (JMR) exercise. The data is consolidated annually and emission reductions calculated based on these net generating figures.

Since the WTGs under the project are connected to the same feeder as other non-VCS projects, the energy generation of each WTG is arrived at based on the agreed procedures followed by Jaipur Vidyut Vitran Nigam Limited (JVVNL). The procedure takes into account apportioning of the total energy generated by each WTG connected to the feeder and the equivalent line losses of each WTG. Based on this calculation, the final invoices are raised. Hence for the emission reduction calculation purposes the net energy generation is sourced from the invoices. However, the total

energy generated and imports of each WTG, as well are monitored as a part of the monitoring plan. The data is consolidated annually and emission reductions calculated based on these net generating figures.

The responsibility of measuring parameters rests with the Operations & Maintenance contractor who is also the technology provider. The data is archived electronically and the retention time for keeping of records is defined in the PD as two years in addition to the crediting period.

The calibration procedure for the energy meters is carried out once in a year and the calibration of energy meters was not under PP control and is solely carried out by the Electricity Board.

Furthermore, the controller meters installed on the individual WTGs are micro-processor based controllers and are reliable. It uses a Woodward Multi function Relay that have three current inputs from CT and three direct voltage inputs (690 Volts). The analog values of current / voltage are converted into digital signal internally using A/D Converters at very high sampling rate. Furthermore, PJRCDM was also able to verify against the letter provider by the equipment supplier that the data provided is accurate and reliable. Given that the final emission reductions are based on the 3rd party data, sourced from the break up sheets and given that it is based on this data that the grid company makes payment to the individual proponents, PJRCDM is of the opinion, it is reasonable to assume that the same will be conservative.

Further the Operations & Maintenance contractor responsible for measurement of parameters carries out internal audits which were verified.

The grid emission factor has been determined ex-ante and is not monitored

3.4 Calculation of GHG Emissions

The GHG source for baseline of the project has been chosen as CO_2 and no other sinks and 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_2/kWh) calculated as a combination of operating margin and build margin according to the procedures prescribed in the 'Tool to calculate the emission factor for an electricity system'.

Emission reductions for the proposed project have been calculated as :

Emission reductions (ER) = Baseline emissions (BE) – Project emissions (PE) – Leakage (L).

Since the proposed project is a renewable energy based project, hence, no project emissions and leakage have been considered in accordance with the baseline methodology AMS ID, version 13.

Hence, the final emission reductions resulting from the proposed bundled project is equivalent to the baseline emissions.

Baseline emissions (BE) = Net amount of electricity generated by the project in a year (EG) * emission factor of the NEWNE regional grid (EF).

While the net annual generation of the project is a metered value, the grid emission factor has been calculated using the data available on the official website of Central Electricity Authority (CEA) under the Ministry of Power, Govt of India. An *ex-ante* fixed combined margin emission factor for the NWENE regional electricity grid of India has been calculated to be 0.90 t CO_2e/MWh, which has been sourced from Central Electricity Authority CO_2 Baseline Database. Central electricity Authority (CEA) (which is an official source of Ministry of Power, Government of India) have worked out baseline emission factor for various grids in India and made them publicly available ("Baseline CO_2 Emission Database Version 4). This database i.e. the CO_2 baseline database provides information about the OM and BM factors of the regional electricity grids in India. PJR CDM confirms that the database is an official publication of the Government of India for the purpose of CDM baselines and the OM in the CEA database is calculated ex ante using the simple OM approach based on the generation weighted average emissions per electricity unit of all fossil-fuelled generating sources serving the system over a three year period of 2006-08. BM is calculated ex ante based on the 20% most recent capacity additions in the grid based on net generation for the year 2007-08 described in tool to calculate the emission factor for an electricity system.

The estimated emission reductions from the project activity have been estimated at an average of 1,056 tCO_2e per annum

3.5 Environmental Impact

The project activity is a renewable energy project with a cumulative capacity of 5MW of WTGs being implemented in Jaisalmer district of Rajassthan. This does not warrant any environmental impact assessment to be carried out as per the current law of India. However, PJR CDM was able to verify the projects compliance with the local laws and regulations.

3.6 Comments by stakeholders

Stakeholder's Consultation Meeting for VCS Project of Balkrishna Industries Ltd., was held at Suzlon Infrstructure Site Office, Jaisalmer, Rajasthan on on 21st August 2009. Invitation letters and an advertisement was placed in the local newspaper inviting the stakeholders for the meetig. This was cross checked with the provided evidence of letters of invitation.

The persons attending the stakeholder meeting have signed an attendance sheet and the same had been verified. All the relevant stakeholders have provided positive opinion about the project.

4 VALIDATION CONCLUSION

PJR CDM Inc. has performed the validation of the project "5.0 MW small scale wind based power generation for captive use by Balkrishna Industries Limited (BIL) in 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.

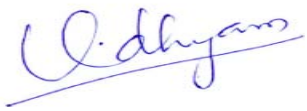
PJRCDM's approach is risk-based, drawing on an understanding of the risks associated with the meeting of VCS 2007.1 standard requirements. The assessment was based on the review of project description (PD), supporting evidences, site interview, including other explanations where necessary to enable PJRCDM 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 5.0 MW to the grid, thereby displacing grid power. The VCS approved CDM baseline and monitoring methodology AMS I D, version 13 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 8,059 tCO_2e per annum. This estimate is fair given that the underlying assumptions do not change.

Based on the information provided by the project developer, it is PJR CDM's opinion that the "5.0 MW small scale wind based power generation for captive use by Balkrishna Industries Limited (BIL) in Rajasthan, India" in India, as described in the VCS PD of Version 3, dated 28th October 2009, meets all relevant VCS 2007.1 requirements and correctly applies approved CDM simplified baseline and monitoring methodology AMS-I.D, version 13.



GHG Auditor
PJR CDM

Site program Manager
PJR CDM

APPENDIX I: DOCUMENTS REVIEWED

Sl. No.	***Document reference***
[01]	VCS PD: "*Grid-connected wind electricity generation project identified as Project E5 in Maharashtra and Tamil Nadu, India"*, version 01 to 03, dated 28th October 2009
[02]	Financial and benchmark evaluation worksheets
[03]	AMS-I.D., Version 13, "Grid connected renewable energy generation".
[04]	Voluntary Carbon Standard, Voluntary Carbon Standard 2007.1, 18th November 2008
[05]	Voluntary Carbon Standard, Voluntary Carbon Standard Program Guidelines, 18th November 2008
[06]	ISO 14064 part I, II and III : 2006
[07]	Indicative Simplified Baseline and Monitoring Methodologies for selected Small-Scale CDM Project Activity Categories, Annex 20 to EB 41
[08]	Version 01.1 of "Tool to calculate the emission factor for an electricity system"
[09]	Attachment A to Appendix B, tool for demonstration of additionality for small scale projects, Version 06, 30th September 2005
[10]	Approval/clearance from Rajasthan Renewable Energy Corporation Ltd. issued to Balkrishna Industries Ltd. on 20th January 2005 for transfer of land of the project activity.
[11]	Purchase Order placed by Balkrishna Industries Ltd. with Suzlon Energy Ltd. on 3rd August 2004 for the 4 WTGs.
[12]	Work Order for Civil & electrical work, and the Erection, Installation & Commissioning between Balkrishna Industries Ltd. and Suzlon Developers Pvt. Ltd. on 3rd August 2004.
[13]	Power Purchase Agreement between Balkrishna Industries Ltd. and JVVNL on 21st September 2004 for 5MW (for WTGs with location number – J-270, 275, 276 and 280).
[14]	Commissioning Certificates of the WTGs for Balkrishna Industries Ltd., Location number: J-270, 275, 276 & 280 from the RRVPNL, vide letter dated 31st December 2004.
[15]	Contract with Validator, PJR signed by Balkrishna Industries Ltd., dated 10th November 2008
[16]	Rajasthan Electricity Regulatory Commission notification dated 23rd January 2009

[17]	Minutes of Stakeholders meeting of • Balkrishna Industries Ltd. held on 21st August 2009 at Suzlon Site Office, Jaisalmer, Rajasthan with appended attendance sheet and the photographs.
[18]	Tariff Order for wind and biomass projects by Rajasthan Electricity Regulatory Commission, dated 9th March 2007.
[19]	Version 04 of the CO_2 database by the official website of Central Electricity Authority (CEA), Ministry of Power, Government of India. (www.cea.com)
[20]	Reserve Bank of India Annual Report http://rbidocs.rbi.org.in/rdocs/AnnualReport
[21]	Letter from the equipment provider – Suzlon Energy Ltd, on the operational lifetime of the project activity dated 01st October 2009.
[22]	Letter from the equipment provider, Suzlon Energy Ltd, on the controller readings and data reliability.
[23]	Operation & Maintenance Agreement between Balkrishna Industries Ltd. and Suzlon Infrastructure Services Ltd. on 29th December 2007.
[24]	Publi notice of Balkrishna Industries Ltd., dated on 4th August 2009.
[25]	Invoice against the Electricity delivered during the period December 2004 to March 2009 to Rajasthan Power Procurement Centre.
[26]	Joint meter reading for the month of November 2007 taken on 1st December 2007
[27]	No objection certificate from Senergy Global Ltd. issued to Balkrishna Industries Ltd. on 30th March 2009 for withdrawal of CDM registration.
[28]	Policy for Promotion of Electricity Generation from wind, 2003

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
CAR 1: The project activity applies a CDM approved small scale methodology AMS ID, the PP is required to only apply the additionality tools as recommended in the *"Attachment A to appendix B of the simplified Modalities & Procedures for small scale CDM project activity"*. Pls correct the same.	2.5	**PP response 1:** In accordance with paragraph 28 of the simplified modalities and procedures for small scale CDM projects, a simplified baseline and monitoring methodology listed in Appendix B may be used if the project participant can demonstrate that project activity would otherwise not be implemented due to the existence of one or more barrier(s) listed in the Attachment A to Appendix B. Project participant has chosen to demonstrate additionality of the project activity due to presence of investment barrier by means of a benchmark analysis. **PP response 2:** Done	The PP has now corrected the tools for proving the additionality of the project. ***This CAR is closed. .***

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
CAR 2: PP is requested to provide the following: a) The uncertainties in data monitoring may arise on account of the defects in meters. The procedures to deal with defects in meters or failure of the main meter needs to be included in the PD. b) Project participant has not defined the procedures for internal audits and procedures for performance reviews and corrective actions**.**	3.3	**PP response1:** a) Addressed in Section 3.4 of the VCS-PD b) Done **PP response 2:** The corrective procedure for data sourcing and usage in the event of meter failures has been outlined in Section 3.4 of the VCS-PD modest **PP Response:** In case if both meters, main and back-up meters, are out of order for the same period, then there will not be any emission reduction accruing due to the project activity. In the event that any on-board meter on the WTGs, including those that are external to the project activity, fails, the average daily generation of the rest of the month, or of thirty days immediately preceding the period of failure, whichever is lower, will be taken to compute the total generation of the WTG in the period that the meter is down.	a) The PD now includes clear procedures for cases of meter failure. b) It has been defined that the PP shall carry out annual internal audits to ensure performance reviews and implement corrective actions. ***This CAR is closed.***

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
		Same has been incorporated in VCS-PD.	
CL 1 Pls include in the PD in section 1.3, which category of project as per VCS 2007.1 definition, the project activity would fall under.	1.3	**PP response1:** Done **PP response2:** The type/ Category of the project is Energy Industries (renewable-/non-renewable sources). Same incorporated in Section 1.2 of VCS-PD. **PP response:** Corrected in VCS-PD in Section 1.3	This has been addressed in the revised PD. ***This CL is closed.***
CL 2: a) The earliest start date of the crediting period for the VCS project can only be 28 March 2006. Pls revise the PD accordingly. b) Provide evidence for the	1.6	**PP response1:** a) Done b) Attached **PP response2:** Source of life of equipment is Pg 66 of the document at http://www.sebi.gov.in/dp/suzlon.pdf.	a) OK. The start date of crediting period has now been revised. b) The certificate from the equipment manufacturer has been reviewed and it is confirmed that the 20year lifetime is reasonable. ***This CL is closed.***

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
operational lifetime of the WTGs installed under the project activity.		**PP response:** has been provided.	
CL 3: The PP is requested to provide the various approvals, licenses, clearances, power purchase agreement and the commissioning certificates for the WEGs under the project activity to PJR.	1.10	**PP response1:** Commissioning Certificate and RERC Notification is attached. Rest of documents have been sent earlier. **PP response 2:** The sub-lease order for land is submitted. The commissioning certificate is issued by RRVPNL and the Wheeling & Banking Agreement is with JVVNL. Hence, setting up the project and wheeling would not have been possible without the approval of these government bodies. **PP response:** Wheeling & Banking Agreement with SEB has already been provided. It may be noted here that the Rajasthan State Electricity Board has ceased to exist and has been demerged into Rajasthan Rajya Vidyut Utpadan Nigam Ltd., which will be the generation Company; Rajasthan Rajya Vidyut Prasaran Nigam Ltd.,	The various approvals for the project activity have been reviewed and found to be OK. The approval from the SEB was however, not submitted to PJR CDM. However, the same has been accepted, in view of the fact that the project wheeling and banking agreement clearly mentions that the approval for installation of the WTG has been obtained from Rajasthan Renewable energy Corp who has permitted the PP, vide letter number RREC/Wind/2004-2005/4818-4823 dated 21st September 2004. Furthermore, all the other necessary approvals for setting up of the WTGs, were verified and found to be OK. ***This CL is closed***.

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
		which will be the transmission Company and the three regional distribution companies namely 1.Jaipur Vidyut Vitran Nigam Ltd., 2. Ajmer Vidyut Vitran Nigam Ltd. and 3. Jodhpur Vidyut Vitran Nigam Ltd. **Also** Refer Paragraph 4 on Page 2 of Wheeling & Banking Agreement.	
CL 4: The PD states that the project activity does not create any environmental credits. The PP is required to define in the PD, how the PP will take into account if in case REC trading schemes are enforced in India, over the crediting period.	1.13	**PP response1:** The renewable energy credits which are contemplated will only address the energy component and not the GHG emission reductions due to the project activity; hence there will be no double accounting of emission reduction credits. **PP response 2:** If REC trading schemes are enforced in India, the project proponent will withdraw from the VCS Program from the date of enforcement of such schemes. In the eventuality that there is an option available to the project participant, then the latter will provide a letter from the REC program operator	The PD has now to revised to address this issue. ***This CL is closed.***

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
		that the credit has not been used and has been cancelled from the relevant program. Same has been incorporated in the VCS-PD.	
CL 5: The PD currently states that the project activity under consideration has not applied for any other GHG programs like CDM. However, it is seen that the current project activity is a part of the bundled project "*10.35 MW small scale grid connected wind electricity generation project at Jaisalmer in Rajasthan*" under validation by another DOE. Status on the same needs to be provided in the PD.	1.14	The project has been withdrawn from the bundle of projects as per attached documents.	The PP has submitted the documented evidence for withdrawal of the concerned WTGs from the CDM bundle. The same has been check and verified. ***This CL is closed.***
CL 6: Section 1.16 of the PD, needs to be revised to include details on the	1.16	PP response 1: Done in Section 1.4 PP response 2: Filled in Section 1.16	The PD has been revised to include this discussion. ***This CL is closed.***

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
indicators like environmental, economic, technical, social aspects of the projects.			
CL 7: Pls include in section 2.3 of the VCS PD, the details on the project boundary. The grid to which the WEG is connected needs to form a part of the project boundary as well. Furthermore, for clarity pls include a pictorial depiction of the project boundary.	2.2	Done in Section 1.4	OK. ***This CL is closed.***
CL 8: ***Financial Additionality:*** The documented evidences for the following are to be provided to PJR for assessing the financial analysis: a) The commissioning date (certificate), operational lifetime	2.5	**PP response 1:** a) Provided to DOE b) Wheeling and Banking Agreement and Purchase orders provided to DOE c) Provided to DOE d) Provided to DOE e) f) Done in the PDD	a) The data source for PLR considered has been provided. OK. b) The HT tariff of INR 4.01 has been confirmed against the RERC petition and the commission's decision to the same.

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
of the project, the benchmark PLR at the time of the project start date, b) The values considered for the equipment cost, civil work, erection and commissioning, O&M costs, wheeling charges, tariff. Further, it needs to be confirmed if the tariff does not include any escalations. c) Documentary evidence for the line losses of 10% considered for the calculation is to be provided. d) The annual administrative charges to the RREC and RVPN/JVVNL are to be provided e) The insurance cost of 0.6% considered for the project activity f) Pg 12 of the PD states the PP is carrying out a comparative		**PP response 2:** a) Provided in VCS-PD c) Page 53 of the Rajasthan Electricity Regulatory Commission (Terms & Conditions for Determination of Tariff) Regulations, 2009; RERC_MY_Tariff_Regulations_2009.pdf d) Policy for promotion of electricity generation from wind, 2003 Rajasthan_Wind_Policy_2003.pdf e) The insurance component has been revised to 0.02% of the equipment cost, i.e. approximately Rs 40000/- **PP response:** b) Submitted. Refer Table-19, Point 4. c) Line losses are 4.6% as per the Rajasthan Electricity Regulatory Commission (Terms & Conditions for Determination of Tariff) Regulations, 2009; page number 53. d) Included in VCS-PD and communication from wind farm developer for administrative charges to RVNL submitted.	*c) The line losses data has been sourced from* the Rajasthan Electricity Regulatory Commission ARR &Tariff for transmission of electricity and SLDC charges for FY-05 of RVPNL dated 17/04/2004.. ***d) Based on the standard practice in the state. OK.*** *e)* ***OK.*** f) OK. ***This CL is closed.***

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
analysis of the financial indicators. Pls correct this statement since the project applies a benchmark analysis.		e) Changed to 0.22% based on actual premium paid. Policy document is available for validation. **PP response:** c) Line losses are 4.6% as per Paragraph 56 of Rajasthan Electricity Regulatory Commission ARR &Tariff for transmission of electricity and SLDC charges for FY-05 of RVPNL dated 17/04/2004 . d) Included in VCS-PD and communication from wind farm developer for administrative charges to RVNL submitted. e) Insurance cost expunged from the calculation	
CL 8 contd: 1. The tariff per kWh is taken as Rs.4.01. Provide source for considering this tariff rate. 2. Power evacuation cost of Rs.172 lakhs is considered twice in the financial analysis.	2.5	PP response: 1. RERC Order dated 24-Mar-2001 http://www.rerc.gov.in/index1.htm 2. Corrected 3. Provided 4. http://www.rrecl.com/Wind%20Energy%20POLICY%202004.htm 5. Insurance premium paid is corrected to 0.02% of the equipment cost.	1. The RERC order was reviewed and the tariff has been confirmed. OK. 2. OK. 3. OK. 4. ***Ok.***.

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
3. Provide land documents. 4. Substantiate with evidence for considering administrative charges to RREC. 5. The insurance cost is considered at 0.60% of equipment cost. Justify 6. Provide evidence for considering wheeling charges as an expense in the profitability statement. 7. Justify for calculating both equity IRR and project IRR. 8. Justify why salvage value of 5% is not considered as an inflow		6. Available in excelsheet 'Financials' Row 35. 7. Only project IRR is considered. Equity IRR has been expunged from the worksheet. 8. Salvage value has been considered as an inflow. Refer 'Financials' Row 90 Column X.	5. OK. 6. OK. 7. 8. This has now been included in the revised excel worksheet. OK.

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
for calculation of IRR. 9. The sensitivity analysis should be presented in Excel sheet. 10. The basis for PLF provided for individual wind turbines in the IRR analysis is not transparent. 11. The project uses BPLR as the benchmark. Clarity is sought on the basis of equity capital returns used for project IRR's 12. Substantiate the significance of calculating WACC considering beta value of BF Utilities Ltd.		8 Sensitivity analysis is available in the excelsheet. 9 PLF has been calculated from the proposal received from the equipment manufacturer. The VCU calculation excel worksheet provides the calculation of PLF provided by equipment manufacturer. 10 Erroneously appearing. It has been expunged from the file. 11 Expunged from the file. **PP response:** 4 Administrative charges are paid to RVPN for meter testing & calibration. Communication from O&M service provider for payment of such charges to RVPN can be provided as evidence. 8 Corrected. 10 The proposal from the equipment manufacturer was for 6 nos. of WTGs of	9. OK 10. The IRR has now been revised in line with the PLF as per the RERC policy for 2003. The same has been checked and confirmed to be 22.37%. This is OK. 11. OK ***THIS CL is closed.***

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
		1.25 MW capacity with a generation guarantee of 312 lac units. This translates to 26 lac units per WTG. Row 4 only states that 4 WTGs of 1.25 MW capacity working at a CUF (or PLF) of 23.74% will generated that amount of power in 8760 hours, i.e. in one year. **PP response:** 4) Administrative charges paid to RVPN for meter testing & calibration expunged from calculation 10) Table 7, Paragraph 58, RERC Order In the matter of amendments to RERC (Power Purchase & Procurement Process of Distribution Licensees) Regulations 2004 and RERC (Terms & Conditions for Determination of Tariff) Regulations 2004 under Section 61 & 86 of the Electricity Act 2003	

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
CL 9: ***Sensitivity Analysis:*** a) As per the guidelines for carrying out the investment analysis, a sensitivity analysis needs to be carried out for all parameters that constitute more than 20% to the total revenue or costs of the project. Hence, pls include a justification for exclusion tariff and the O&M cost from the sensitivity analysis. b) Section 2.5, Pg 14, makes references to table B.2C and B.2D, of actual generation data. Pls correct the table numbering.	2.5	**PP response 1:** **a)** Earning from the project is directly affected by PLF. The tariff is already fixed as per the Wheeling & Banking agreement. Sensitivity to PLF and O&M cost are already provided in the VCS-PD. **b)** Done **PP response 2:** **a)** Power tariff is a component that is governed by the state regulatory authority. It has no standard escalation basis. Hence, it has not been subjected to sensitivity analysis. Refer PP response to CL 8.1 for source of tariff figure. PP response: It is reiterated that there is no escalation of tariff considered as it is a regulated item governed by the state regulatory commission. Tariff order has already been submitted. Refer	a) the sensitivity analysis has been carried out for the tariff for the project.. b) OK. . ***This CL is closed.***

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
		Table-19, Point 4. PP response: Sensitivity of project IRR to Tariff has been included in the VCS-PD	
CL 10: ***Monitoring plan:*** a) It is stated that the invoices raised by the RVPNL, is sourced from the main meter reading at the sub-station. It needs to be confirmed what method is used for apportioning of the electricity generation of the WTG forming a part of the project activity and that of other non-project WTGs are connected to the same feeder and eventually to a sub-station. The same needs to be included	3.3 3.4	a) Already provided in Annexure 1. Reference provided in Section 3.4 b) Done c) Done PP response 2: a) Provided in Annexure 1. Reference provided in Section 3.4 b) Provided in the Table A in Section 3.2. c) Provided in Section 3.4. **PP response:** **a)** EG_{Fj} is the total power generated and supplied from wind farm through Feeder-j and metered at the wind farm sub-station. $EG_{Fj,exp}$ is power exported to NEWNE Grid through Feeder j and metered as import at meter in HV substation,	a) The procedure used for apportioning of the energy generation from each unit has been clarified in the PD. OK. b) The reliability of the controller readings have been checked against the certificate issued by the equipment supplier. c) OK. Done.…. ***THIS CL IS Closed.***

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
in section 3.4 of the PD. b) More clarity is requested on calibration of the controller/meter at WTG generator outlet. c) Procedures are to be defined in case of failure of the controllers of the non-VCS project activity, if the same is being used to arrive at the final EG_y for the project activity.		Kwh **b)** Will be provided by the equipment manufacturer. **c)** Please refer PP response to CAR 2	
CL 11: The earliest start date of the project activity can only be 28 March 2006 and hence the PD needs to be revised in section 4.4 and 1.3 to have data on emission reductions starting only from 28 March 2006. Pls revise the same.	4.4	PP response 1: Done PP response 2: Done	The crediting period is now corrected. ***This CL is closed.***