

KALADONGER WIND POWER PROJECT IN RAJASTHAN



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Summary: To be described in the FVR

M/s Bindu Vayu Urja Private Limited has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 1st VCS verification of the project “Kaladonger wind power project in Rajasthan” with regard to the requirements of VCS version 3.3.

The project activity is a large scale project with the total installed capacity of 75.6 MW. The project involves installation of 36 nos. of 2.1 MW WTGs of Suzlon make at Kaladonger village in Jaisalmer district in the state of Rajasthan, India. The project activity is set up to produce clean power from the Wind Turbine Generators. The generated electricity is transmitted to the state electricity grid which is connected to the NEWNE grid.

The scope of this verification covers the determination of voluntary greenhouse gas emission reductions generated by the above mentioned project. The verification is based on the registered CDM PDD^{/CDM-PDD/}, Final validation report of CDM^{/FVR-CDM/}, Monitoring report^{/MR/}, supporting emission reduction calculation sheet^{/XLS/} and other supporting documents like JMR^{/JMR/}, breakdown records^{/BR/}, Calibration certificate^{/CAL/}, Invoices^{/INV/} etc. Made available to the verifiers by the project proponent.

As a result of the verification, the verifier confirms that:

- All operations of the project are implemented and installed as planned and described in the project document^{/TS/ /PPA/}. The installed equipment essential for generating emission reductions runs reliable.
- The monitoring plan is in accordance with the applied approved CDM methodology ACM0002 version 12.3.0.
- The installed equipment essential for measuring parameters required for calculating emission reductions are calibrated^{/CAL/} once in a year as per the monitoring plan
- The project has generated GHG emission reduction and the emission reduction from the project activity is real, credible and long term for the whole crediting period^{/JMR/}
- GHG emission reductions are calculated without any material misstatements in a conservative

and appropriate manner^{/XLS/}

All the documents checked during on-site visit and verification process will be kept confidential and will not be disclosed at any time other than the project proponent consent or as required by VCS.

In the course of verification 05 Corrective Action Requests (CARs) and 0 CL were raised and closed successfully. No forward action request was envisaged for present verification.

Reporting period: 18-02-2012 to 30-12-2012 (both dates inclusive)

GHG emission reductions or removals	tCO _{2e}
Baseline emissions	87,057
Project Emissions	0
Leakage	0
Net GHG emission reductions or removals	87,057 tCO _{2e}

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1 INTRODUCTION

M/s Bindu Vayu Urja Private Limited has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 1st periodic VCS verification of the project: “Kaladonger wind power project in Rajasthan” with regard to the relevant requirements of the Verified Carbon Standard VER 3.3. The verification is covered for the period of 18-02-2012 to 30-12-2012 (both dates inclusive). The applied methodology is ACM 0002 version 12.3.0.

1.1 Objective

The purpose of this verification, by independent checking of objective evidence, is as follows:

- To verify that the project is implemented as described in the project design document (PDD);
- To assess the implementation of the monitoring plan (MP) content in the CDM-PDD and approved methodology (ACM0002 Version 12.3.0);
- To assess the project’s compliance with other relevant rules, including the host country (India) legislation;
- To confirm that the monitoring system is implemented and fully functional to generate voluntary emission reductions (VERs / VCUs) without any double counting; and
- To ascertain that the data reported are accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emissions reduction calculation.
- Accuracy of monitoring equipment;
- Quality of evidences

1.2 Scope and Criteria

The 1st VCS verification of this CDM registered project is based on the validated project design CDM PDD^{/CDM-PDD/}, the monitoring report^{/MR/}, emission reduction calculation spread sheet^{/XLS/}, supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment^{/IM01/}. Furthermore publicly available information was considered as far as available and required. The TÜV NORD JI/CDM CP has employed a risk-based approach in the verification, focusing on the identification of significant risks and reliability of project monitoring and generation of emission reductions.

The verification is carried out on the basis of the following requirements, applicable for this project activity:

- Article 12 of the Kyoto Protocol
- VCS Version 03.3 requirements (Standard+ program + registration and issuance document)

- Guidelines for the implementation of Article 12 of the Kyoto Protocol as presented in the Marrakech Accords under decision 3/CMP.1, and subsequent decisions made by the Executive Board and COP/MOP
- Other relevant rules, including the host country legislation
- CDM Validation and Verification Standard ^{/VVS/}
- Monitoring plan as given in the registered PDD ^{/CDM- PDD/}
- Approved CDM Methodology ACM0002 Ver.12.3.0 (Consolidated baseline methodology for grid connected electricity generation from renewable sources) ^{/ACM0002/}

1.3 Level of assurance

The verification report is based on CDM-PDD ^{/CDM-PDD/}, Monitoring report ^{/MR/}, Final Validation report ^{/FVR-CDM/} and supporting documents e.g. Breakdown records ^{/BR/}, Calibration certificate ^{/CAL/}, Invoices ^{/INV/} and JMR ^{/JMR/} made available to the verifier and information collected through performing interviews during the on-site assessment. The verification opinion is assured provided the credibility of all above.

1.4 Summary Description of the Project

The project activity produces clean power from the Wind Turbine Generators (WTGs). The Project harnesses renewable sources of energy in the region displacing non-renewable natural resources thereby ultimately leading to sustainable economic and environmental development. The Project being a renewable energy project thus leads to reduce greenhouse gas (GHG) emissions as it displaces electricity from fossil fuel based electricity generation plants. The project considered has been implemented at Kaladonger village in Jaisalmer District in Rajasthan State of India.

The project activity consists of implementation of 36 WTGs of Suzlon make of 2.1 MW each, total installed capacity being 75.6 MW. The Project activity harnessed renewable resources in the region, thereby displacing non-renewable natural resources ultimately leading to sustainable economic and environmental development. Suzlon Energy Limited (SEL) is the equipment supplier and the operations and maintenance contractor for the Project.

Table 1-1: Technical data of the project

Parameter	Unit	Value
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Parameter	Unit	Value
No of Blades		3
Rated Power	MW	2.1
Rotor diameter	m	95
Cut in wind speed	m/s	3.5
Cut out wind Speed	m/s	25
Generator Type	-	Asynchronous 3 phase induction generator with slip rings operated with rotor circuit inverter system.
Frequency	Hz	50
Tower Height	m	90

2 VALIDATION PROCESS, FINDINGS AND CONCLUSION

2.1 Validation Process

Provide the following:

- Method and Criteria: The validation has been carried out for to cover the sections 1.2, 1.3, 1.5, 1.6, 1.7, 1.9, 1.10, 1.12.1, 1.12.2, 1.12.3, 1.12.4 and 1.13 of the VCS Project Description Template.
- Document Review: A document review w.r.t to project implementation and actual operation was carried out. A site visit was conducted to confirm the actual installations and working of the WECs. The monitoring procedures are detailed in the below sections of this report.
- Interviews & Site Inspections: During the site visit interviews with the operational personnel have been conducted, the roles and responsibility have been discussed and found in line with the description in the registered PDD
- Resolution of Any Material Discrepancy: During the validation process 1 CAR has been raised, the details of the issue raised and its closure are described under section 2.2.1.

2.2 Validation Findings

2.2.1 Gap Validation

A Gap validation has been carried out for to cover the sections 1.2, 1.3, 1.5, 1.6, 1.7, 1.9, 1.10, 1.12.1, 1.12.2, 1.12.3, 1.12.4 and 1.13 of the VCS Project Description^{/VCS PD/}. The project description is in accordance with the Registered CDM PDD^{/CDM PDD/}, the additional information w.r.t issues covered under Gap validation are as follows;

Ownership:

The project proponent “M/s Bindu Vayu Urja Private Limited” is the owner of the project WTGs, the same has been confirmed with the HCA received for the project activity.

Start date:

The earliest commissioning date^{/CC/} of project WTG is 18th February 2012, which represents the start date. The validation for the project was completed on 2012-12-24^{/CDM-VAL/}, thus the eligibility under VCS is complied to as the validation activity has been completed within 2 years from the start date. Thus the project is eligible to participate under VCS standard version 03.3.

Participation in other GHG programs:

The project is registered under an approved GHG program, i.e CDM registration no. 9342.

Other Environmental Credits:

The project proponent has provided a written undertaking which states that “The project neither has nor intends to generate any other form of GHG-related environmental credit for GHG emission reductions or removals claimed under the VCS Program, or that any such credit has been or will be cancelled from the relevant program for the monitoring period 18-02-2012 to 30-12-2012.

Commercially sensitive information:

The project activity does not have any commercially sensitive information, the CDM PDD is publicly available and has been cross-checked to confirm the same.

During the course of Gap Validation CAR 2.2.1 has been raised and subsequently closed out based on the assessments detailed below.

Gap Validation	CAR 2.2.1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in un-ambiguous style; address the context (e.g. section)</i>	The crediting period is incorrect as mentioned in the VCS PD. Appropriate correction is sought.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details. In case the PDD is changed as part of the CA, the PP is requested to indicate the revised sections as well as the new version No.</i>	The crediting period has been revised in the PD and MR.		
	☒ Changes in PD	Section(s):	New version No.: 02
	☐ Changes in XLS	Worksheet(s):	New version No.:
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The revised VCS PD and MR mention the crediting period as 10 years from the start date. The same is inline with the VCS requirements and is acceptable. CAR is closed.		

Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed
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2.2.2 Methodology Deviations

There is no deviation applied w.r.t methodology applied to the project activity.

2.2.3 Project Description Deviations

There is no deviation applied w.r.t project implementation.

2.2.4 New Project Activity Instances

The project is not a grouped project; however there are no instances of new WTGs added to the project activity. The project capacity remains the same as per the registered PDD, i.e. 75.6 MW.

2.3 Validation Conclusion

A Gap validation has been carried out for to cover the sections 1.2, 1.3, 1.5, 1.6, 1.7, 1.9, 1.10, 1.12.1, 1.12.2, 1.12.3, 1.12.4 and 1.13 of the VCS Project Description^{/VCS-PD/}. The project confirms to the requirements under VCS Version 3.3 w.r.t to the gap validation.

3 VERIFICATION PROCESS

The project is registered under CDM project no. 9342 (<http://cdm.unfccc.int/Projects/DB/RWTUV1356681143.52/view>) and the present verification covers the period which is within 2 years prior to the CDM registration.

3.1 Method and Criteria

The current verification of the project was carried out for the monitoring period from 18-02-2012 to 30-12-2012 (both dates inclusive).

1. Contract signed: 19/04/2013
2. On-site verification: 01/08/2013
3. (Draft) Reporting: 06/08/2013
4. (Final) Reporting: 26/08/2013

The verification consists of the following steps:

- Contract review
- Appointment of team members and technical reviewers

The list of involved personnel, the tasks assigned and the qualification status are summarized in the Table 3-1 below.

Table 3-1: Involved Personnel

	Name	Company	Function 1)	Qualification Status 2)	Scheme competence 3)	Technical competence 4)	Verification competence 5)	Host country Competence	On-site visit
☒ Mr. ☐ Ms.	Jimmy Sah	TUV India Pvt. Ltd.	TL/TE ^{A)}	LA	☒	1.2	☒	☒	☒
☒ Mr. ☐ Ms.	Indrapal Parmar	TUV India Pvt. Ltd.	TM/TE ^{A)}	LA	☒	1.2	☒	☒	☐
☐ Mr. ☒ Ms	Katja Beyer	TN CERT GmbH	OR ^{B)}	LA	☒		☐	☐	☐
☒ Mr. ☐ Ms.	Stefan Winter	TN CERT GmbH	TR/FA ^{B)}	SA	☒	1.2.2	☒	☐	☐

- 1) TL: Team Leader; TM: Team Member, TR: Technical review; OT: Observer-Team, OR: Observer-TR; FA: Final approval
- 2) GHG Auditor Status: A: Assessor; LA: Lead Assessor; SA: Senior Assessor; T: Trainee; TE: Technical Expert
- 3) GHG auditor status (at least Assessor)
- 4) As per S01-MU03 or S01-VA070-A2 (such as 1.1, 1.2, ...)
- 5) In case of verification projects
 - A) Team Member: GHG auditor (at least Assessor status), Technical Expert (incl. Host Country Expert or Verification Expert), not ETE
 - B) No team member

- A desk review of the VCS PD^{/VCS-PD/} CDM PDD^{/CDM-PDD/} and supporting documents (refer annex 3) with the use of the relevant sections of a customized protocol according to the VCS version 03.3;
- A desk review of the Monitoring Report^{/MR/} and additional supporting documents which were submitted by the client. The relevant sections of the above mentioned customized protocol according to the VCS version 03.3 were used;
- Verification audit planning;
- On-Site assessment;
- Background investigation;
- Follow-up interviews with personnel of the project developer;
- Verification reporting (Draft Verification Report and Final Verification Report)

The criteria of this verification include the relevant rules and steps as set out in the VCS version 03.3.

3.2 Document Review

The submitted MR (version 1 and 2)^{/MR/}, XLS sheet (ver.1 and 2)^{/XLS/} and supporting background documents like share certificates JMR reports^{/JMR/}, Calibration certificates^{/CAL/}, Meter, PPA^{/PPA/}, Commissioning Certificates^{/CC/}, Breakdown details^{/BR/} etc. related to the project design and monitoring were reviewed.

Furthermore, the assessment team used additional documentation by third parties such as QA/QC procedures which is the responsibility of the O&M contractors (Suzlon Energy Limited). The O&M contractors have proper procedures for data handling and storage. The calibrations for the meters are carried out by the State Electricity Board officials. The CDM PDD mentions the calibration shall be conducted once in a year. The calibration certificates^{/CAL/} have been checked by the verification team and found them correct.

3.3 Interviews

During verification the verification team has performed site visit and interviews to confirm selected information and to resolve issues identified in the document review. The main topics of the interviews are summarized in the Annexure.

3.4 Site Inspections

The onsite visit was performed to check whether the project is implemented as per the description in the registered CDM PDD. The O&M personal were interviewed and the result is summarized in section 4 of this report.

Interviewed Persons / Entities	Interview topics
Project proponent representatives: Pls. refer the list in annexure 2.	- General aspects of the project - Technical equipment and operation - Changes since validation - Monitoring and measurement equipment - Calibration procedures - Quality management system - Involved personnel and responsibilities - Training and practice of the operational personnel - Implementation of the monitoring plan - Monitoring data management - Data uncertainty and residual risks - GHG calculation - Procedural aspects of the verification - Maintenance - Environmental aspects - Editorial issues of the Monitoring Report

3.5 Resolution of Any Material Discrepancy

1. Definition: A Corrective Action Request (CAR) will be established where:

- Mistakes have been made in assumptions, application of the methodology or the project documentation which will have a direct influence the project results,
- The requirements deemed relevant for validation of the project with certain characteristics have not been met or,
- There is a risk that the project would not be registered by the UNFCCC or that emission reductions would not be able to be verified and certified.

A **Clarification Request (CL)** will be issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

A **Forward Action Request (FAR)** will be issued when certain issues related to project implementation should be reviewed during the first verification.

2. Draft Verification Report

After reviewing all relevant documents and taken all other relevant information into account, the assessment team issues all findings in the course of a draft verification report and hands this report over to the project proponent in order to respond on the issues raised and to revise the project documentation accordingly.

3. Final Verification Report

The final verification starts after issuance of the proposed corrective action (CA) of the CARs CLs and FARs by the project proponent. The project proponent has to reply on those and the requests are “closed out” by the assessment team in case the response is assessed as sufficient. In case of raised FARs the project proponent has to respond on this, identifying the necessary actions to ensure that the topics raised in this finding are likely to be resolved at the latest during the subsequent verification. The assessment team has to assess whether the proposed action is adequate or not.

In case the findings from CARs and CLs cannot be resolved by the project proponent or the proposed action related to the FARs raised cannot be assessed as adequate, no positive validation opinion can be issued by the assessment team.

The CAR(s) / CL(s) / FAR(s) are documented in chapter 4 below.

4. Technical review

Before submission of the final verification report a technical review of the whole verification procedure is carried out. The technical reviewer is a competent GHG auditor being appointed for the scope this project falls under. The technical reviewer is not considered to be part of the validation team and thus not involved in the decision making process up to the technical review.

As a result of the technical review process the verification opinion and the topic specific assessments as prepared by the verification team leader may be confirmed or revised. Furthermore reporting improvements might be achieved.

5. Final approval

After successful technical review of the final report an overall (esp. procedural) assessment of the complete validation will be carried out by a senior assessor located in the accredited premises of TÜV NORD.

Only after this step the request for issuance can be started (in case of a positive validation opinion).

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activity consists of the 36 WECs of Suzlon make of 2100 KW each, totalling to the capacity of 75.6 MW. The Project considered harnessed renewable resources in the region, thereby displacing non-renewable natural resources thereby ultimately leading to sustainable economic and environmental development.

The project monitors the Net electricity exported to the grid by the project activity. The same is a calculated value which is sourced directly from the JMR provided Jaipur Vidyut Vitran Nigam Limited (JVVNL).

The detail of metering points are as follows based on the respective locations:-

There are 36 WEGs of project activity installed in Jaisalmer district which is connected through 220 kV Suzlon pooling sub-station (GSS) at Kaladonger, through 33 kV feeder lines. At GSS sub-station electricity is stepped up to 220 kV, wherein the Feeder meters (one main meter and one back up meter) is connected. From Kaladonger sub-station electricity is transmitted to state utility (DISCOM) sub-station (Amarsagar) through 220 kV transmission line/ EHV line wherein the billing meter (one main meter and one check meter) is connected. Thereafter electricity is further transmitted to NEWNE grid.

The monthly Joint Meter Readings (JMR) is taken in presence of DISCOM officials and SEL (as a representative of all the clients). Since the project activity WTGs are connected through common metering system along with non-project activity WTGs, apportioning of electricity export & import as recorded in JMR is being done to calculate the values for the project activity. Apportioning is being done based on the ratio of generation values recorded for the project WTGs and the value for generation of all the WTGs connected to the billing meter. The apportioning process is carried out by the O&M contractor SEL and is submitted to respective DISCOM, the same is verified and approved by respective DISCOMs. Subsequently PPs raises an invoice to the DISCOM and the payment is made in line with the DISCOM provisions.

Once the PP raises the invoice based on the monthly breakup sheet corresponding to the net electricity generation value indicated in the monthly breakup sheet. DISOM based on the JMR reading along with monthly breakup sheet prepared by SEL and the invoice raised by investors, conduct the audit to cross check the net electricity values and in case all the values are found to be correct, DISCOM release the payment against the invoice raised by individual investors.

The value of the net electricity supplied to grid by project activity has also been cross checked with invoices raised by the PP on DISCOM and found correct.

The methodology followed for present verification is approved registered consolidated methodology ACM0002 version 12.3.0. No deviation is sought in the applied methodology after the registration of the project activity.

During the monitoring period (18-02-2012 to 30-12-2012), the net electricity exported to the grid by the project activity is 91379.587 MWh and thus the total baseline emission for this monitoring period is computed to 87,057 tCO₂e.

It was verified during the site visit and the subsequent review of the, Commissioning Certificates^{/CC/} in the course of this verification that the actual project activity was implemented in accordance with the CDM PDD.

Following CARs were raised during the verification process and thus closed successfully.

Project Implementation	CAR 4.1.1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The project description and implementation as mentioned in the VCS MR does not provide the details regarding the total feeder lines and the corresponding substation details for the project activity. Further the location of the metering points is also missing.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details. In case the PDD is changed as part of the CA, the PP is requested to indicate the revised sections as well as the new version No.</i>	The detailed diagram for the same has been included in the updated MR.		
	☒ Changes in MR	Section(s): section 5	New version No.:
	☐ Changes in XLS	Worksheet(s):	New version No.:
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The detailed diagram for the project layout is now described under section 5 of the updated MR. The layout of the project implementation has been confirmed during the site visit and is acceptable. CAR is closed.		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

4.2 Accuracy of GHG Emission Reduction or Removal Calculations

The baseline emissions reductions are based on the net electricity exported to the grid by the WTGs. The project emissions are zero for the project activity. Also, as per the methodology the leakage emission need not be calculated for this project activity. Therefore the baseline emission equals the Emission Reductions.

The formula used to calculate the baseline emission is as per the registered CDM PDD.

The project activity includes Suzlon wind turbines (2100 kW) with internal electrical lines connecting the project activity with local evacuation facility. SEL is responsible for operation and maintenance activities for this project which is also the technology and equipment supplier. According to the ACM0002, ver 12.3.0, quantity of net electricity generation supplied by the project activity to the grid in year y is monitored.

There are 36 WEGs of project activity installed in Jaisalmer district which is connected through 220 kV Suzlon pooling sub-station (GSS) at Kaladonger, through 33 kV feeder lines. At GSS sub-station electricity is stepped up to 220 kV, wherein the Feeder meters (one main meter and one back up meter) is connected. From Kaladonger sub-station electricity is transmitted to state utility (DISCOM) sub-station (Amarsagar) through 220 kV transmission line/ EHV line wherein the billing meter (one main meter and one check meter) is connected. Thereafter electricity is further transmitted to NEWNE grid.

The monthly Joint Meter Readings (JMR) is taken in presence of DISCOM officials and SEL (as a representative of all the clients). Since the project activity WTGs are connected through common metering system along with non-project activity WTGs, apportioning of electricity export & import as recorded in JMR is being done to calculate the values for the project activity. Apportioning is being done based on the ratio of generation values recorded for the project WECs and the value for generation of all the WECs connected to the billing meter.

Procedure used for apportioning has been assessed as follows;

The monthly JMR reading contains the parameters of electricity export, import & net electricity supplied by all the WTGs of project activity as well as non project activity connected to the metering system at DISCOM substation. Hence in order to arrive at the electricity export, import & net electricity supplied by WEGs of the project activity an apportioning approach based on the ratio of project panel generation to the panel generation of all the WECs connected to the common meter is applied.

Export by project WTG = JMR Export * (panel generation of project/panel generation of all WECs connected to the common metering)

Similarly for Import the same ratio is applied. Based on the export and import values the net electricity supplied to the grid by the project activity is arrived.

The above mentioned of apportioning is done by the O&M contractor SEL and is submitted to respective DISCOM, the same is verified and approved by respective DISCOMs. Subsequently PPs raises an invoice to the DISCOM and the payment is made in line with the DISCOM provisions.

Once the PP raises the invoice based on the monthly breakup sheet corresponding to the net electricity generation value indicated in the monthly breakup sheet. DISCOM based on the JMR reading along with monthly breakup sheet prepared by SEL and the invoice raised by investors, conduct the audit to cross check the net electricity values and in case all the values are found to be correct, DISCOM release the payment against the invoice raised by individual investors.

All the metering equipment are under custody of DISCOM and they duly inspected & calibrated^(CAL) by state utility at an annual frequency. Calibration and meter details for the meters are as listed below:-

Meter Details for project activity:

Meter Type	Meter Sr. number	Accuracy class	Make	Calibration Date	Due Date
Main meter	UPP31771	0.2	Secure Meters Limited	13/12/2012	13/12/2013
Back up meter	UPP31772	0.2	Secure Meters Limited	13/12/2012	13/12/2013
Main meter	UPP31774	0.2	Secure Meters Limited	13/12/2012	13/12/2013
Back up meter	UPP31776	0.2	Secure Meters Limited	13/12/2012	13/12/2013
Main meter	UPP31769	0.2	Secure Meters Limited	13/12/2012	13/12/2013
Back up meter	UPP31770	0.2	Secure Meters Limited	13/12/2012	13/12/2013
Main meter	UPP31766	0.2	Secure Meters Limited	13/12/2012	13/12/2013
Back up meter	UPP31783	0.2	Secure Meters Limited	13/12/2012	13/12/2013
Main meter	RJB78190	0.2	Secure Meters Limited	13/12/2012	13/12/2013
Back up meter	RJB78191	0.2	Secure Meters Limited	13/12/2012	13/12/2013

There was not any significant period of shut-down or break-down period during the monitoring period.

The All necessary monitoring instruments operating procedures for the project have been implemented in an appropriate manner. In this project, energy meters with 0.2% accuracy have been installed for monitoring of the electricity export and import.

During this monitoring period the project activity has exported 91379.587 MWh of net electricity to the NEWNE grid. This was verified by the verification team by checking the JMR and electricity sales invoice^{/INV/} which is issued by state utility and most authentic and reliable document for this project activity.

The value of Grid Emission Factor of NEWNE grid ($EF_{Grid,CM,y}$) has been opted as ex-ante as per registered PDD. For this project, PP used 0.9527 tCO₂/MWh as emission factor for NEWNE grid of India which is the Combined Margin Emission Factor as per the CEA database (version 7) and same is used for emission reduction calculation^{/XLS/}.

During the review of emission reduction spread sheet^{/XLS/}, assessment team found emission reductions are not traceable as the values for the monitoring parameters are not directly sourced from the JMR sheet, thus CAR 4.2.1 was raised and subsequently based on the revised MR and emission reduction calculation sheet, CAR was closed out.

Based on the above the values used in the emission reduction calculation^{/XLS/} are correct and formula and justification used for the calculation is consistent with the registered PDD and applied methodology and related tools. Further the ex ante fixed values and default values have been applied correctly inline with VVS §245 (e) and 246 (d).

Moreover, the following CARs were raised during the verification process which was closed successfully:

Emission Reduction Calculation	CAR 4.2.1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in un-ambiguous style; address the context (e.g. section)</i>	The emission reduction calculations are not traceable for the months of february 2012 and December 2012. Further the JMR and invoices are missing for the following months; JMR report: Feb 2012 Invoices: Feb, March 2012		
Corrective Action #1	Since the electricity import by the WTGS is greater than export by WTGs for the month february 2012, the net electricity export is negative and the		

<i>This section shall be filled by the PP. It shall address the corrective action taken in details. In case the PDD is changed as part of the CA, the PP is requested to indicate the revised sections as well as the new version No.</i>	same can be inferred from invoice and JMR. Hence the CERs generated for the month February 2012 is negative. Since the crediting period under CDM starts on 31st December 2012, the gross generation recorded at the WTG panel meter on 31st December 2012 has been subtracted from the net electricity exported. The JMR for February 2012 and invoice for February 2012 and March 2012 has been submitted.		
	☒ Changes in MR	Section(s): section 4	New version No.: 02
	☐ Changes in XLS	Worksheet(s):	New version No.:
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The emission reduction calculations are traceable and the justification for the month of February and December is acceptable. CAR is closed.		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

4.3 Quality of Evidence to Determine GHG Emission Reductions or Removals

Proper data management inclusive of data acquisition and aggregation, data management system is being followed for the project activity. All records needed for monitoring are archived in line with the requirements of the registered monitoring plan^{/CDM PDD/}. No significant lack of evidence and missing data were detected during on-site verification. It is evident from the monitoring data that the monitoring system ensures for continuous (except some routine breakdowns or outage) operation.

All internal data are subjected to QA/QC measures. SEL is the O&M contractor and is ISO 9001:2000^{/ISO/} certified and has proper procedures for data handling which is cross checked by the verification team to ensure that the QA/QC procedure is followed as per the ISO standard.

The monitoring personnel at site are well trained and follow reproducible routines. The training records^{/TR/} of the plant personals have been cross checked and found OK. Thus, they are competent to carry out the relevant tasks with sufficient accuracy. The net electricity exported to the grid by the project has been sourced from the JMR. The net electricity value has also been cross checked by the verification team with invoices raised and found OK.

The emission factor for the NEWNE grid to which the project activity exports power to is determined as 0.9527 tCO₂e/MWh, a value fixed ex-ante during the validation of the project activity and sourced from the official source for grid emission factor in India ("CO₂ Baseline Database for Indian Power Sector" published by the Central Electricity Authority, Ministry of Power, Government of India, Sector, Version 07"

available at www.cea.nic.in). Thus the process of determining the emission reduction is appropriate and correct.

No significant, lack of evidence and missing data were detected during on-site verification. It is evident from the monitoring data that the monitoring system ensures for continuous (except some routine breakdowns or outage) operation.

All internal data are subjected to QA/QC measures. SEL is ISO 9001:2008^{/ISO/} certified and has proper procedures for data handling i.e. periodic data review by the management, internal audits etc. The ISO certificate is checked by the verification team to ensure that the QA/QC procedure is followed as per the ISO standard.

The monitoring personnel at site are well trained and follow reproducible routines. The training records^{/TR/} of the plant personals have been cross checked and found OK. Thus, they are competent to carry out the relevant tasks with sufficient accuracy. All necessary monitored and measured raw data were checked during on-site verification.

Moreover, the following CARs were raised during the verification process which was closed successfully:

Emission Reduction Calculation	CAR 4.3.1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in un-ambiguous style; address the context (e.g. section)</i>	The JMR and invoices are missing for the following months; JMR report: Feb 2012 Invoices: Feb, March 2012		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details. In case the PDD is changed as part of the CA, the PP is requested to indicate the revised sections as well as the new version No.</i>	The JMR for February 2012 and invoice for February 2012 and March 2012 has been submitted.		
	☐ Changes in MR	Section(s):	New version No.:
	☐ Changes in XLS	Worksheet(s):	New version No.:
DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be</i>	The JMR and Invoice have been submitted, the values are cross-checked and confirmed with the same. CAR is closed.		

added.	
Conclusion Tick the appropriate checkbox	☐ To be checked during the first periodic verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed

Emission Reduction Calculation	CAR 4.3.2		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding Describe the finding in un-ambiguous style; address the context (e.g. section)	The comparison of emission reductions with ex-ante estimates is missing for the project.		
Corrective Action #1 This section shall be filled by the PP. It shall address the corrective action taken in details. In case the PDD is changed as part of the CA, the PP is requested to indicate the revised sections as well as the new version No.	The comparison of emission reduction with ex-ante estimates has been included in the updated MR.		
	☒ Changes in MR	Section(s): 4.4	New version No.: 02
	☐ Changes in XLS	Worksheet(s):	New version No.:
DOE Assessment #1 The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.	The comparison of emission reduction values are now described in the revised MR. The ER values are lower than the estimated values.		
Conclusion Tick the appropriate checkbox	☐ To be checked during the first periodic verification ☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

4.4 Management and Operational System

The allocation of responsibilities is documented in a written form and is followed as described in the CDM PDD. The project data will be archived for 2 years after the end of the crediting period (10 years) in the hard as well as soft copy format. Routines for the archiving of data are defined and documented.

The overall authority of the project site belongs to EPC contractor SEL and PP has a site in-charge who is responsible for regular monitoring and data compilation at the site. The Joint meter readings are noted in presence of officials from plant personnel and the DISCOM officials.

The O&M contractor i.e. SEL and the staff personnel of O&M contractor carries out activities like blade cleaning, Nacelle cleaning, Transformer oil filtration, control panel maintenance, etc. The O&M service provider would be responsible for watch ward and security of the turbines and the equipment, data logging for power generation, grid availability, machine availability, preparation & submission of monthly performance report in agreed format. They are also responsible for visual inspection of WTGs & all parts thereof and technical assistance including checking of various technical, safety and operational parameters of the equipment, trouble shooting and relevant technical services.

The roles and responsibility of the different personal involved for the accurate determination of emission reduction is followed as per the registered PDD. The Management structure as presented in the MR is also as per the registered PDD. The same is checked by the assessment team during the verification site visit and found OK.

5 VERIFICATION CONCLUSION

The scope of this verification covers the determination of voluntary GHG reductions generated by the above mentioned project. The verification is based on the registered CDM PDD ^{/CDM-PDD/} VCS PD ^{/VCS-PD/}, Final validation report of CDM ^{/FVR-CDM/}, Monitoring report ^{/MR/}, supporting emission reduction calculation sheet ^{/XLS/} and other supporting documents made available to the verifiers like JMR reports ^{/JMR/} and calibration certificates ^{/CAL/} by the project proponent.

As a result of the verification, the verifier confirms that:

- All operations of the project are implemented and installed as planned and described in the project document ^{/TS/, /PPA/}. The installed equipment essential for generating emission reductions runs reliable.
- The monitoring plan is in accordance with the applied approved CDM methodology ACM0002 version 12.3.0.
- The installed equipment essential for measuring parameters required for calculating emission reductions are calibrated ^{/CAL/} once in a year in the presence of the O&M and DISCOM.
- The monitoring system is in place and functional ^{/IM01/}. The project has generated GHG emission reduction and the emission reduction from the project activity is real, credible and long term for the whole crediting period ^{/CN/}
- GHG emission reductions are calculated without any material misstatements in a conservative and appropriate manner ^{/XLS/}
- The monitoring plan as set out in the registered CDM PDD was as per the onsite practices followed.
- The contract for the Verification for the project was signed on 19/04/2013 which is after the cut off date of 04/10/2012, thus the requirements under VCS standard 3.3 section 5.3.13 for rotation of verification bodies is applicable. However, as the project is for 1st periodic VCS verification thus rotation of DOE is not applicable for the current monitoring period.

Reporting period: From 18-02-2012 to 30-12-2012 (both dates inclusive)

Verified GHG emission reductions or removals in the above reporting period:

GHG Emission Reductions or Removals	tCO ₂ e
Baseline Emissions	87,057
Project Emissions	0

Leakage	0
Net GHG emission reductions or removals	87,057

Also, all the documents checked during on-site visit and verification process will be kept confidential and will not be disclosed at any time other than the project proponent consent or as required by VCS.



Mumbai, 2013-08-26
Mr. Jimmy Sah
TÜV NORD JI/CDM Certification Program
Verification team Leader



Essen, 2013-08-26
Stefan Winter
TÜV NORD JI/CDM Certification Program
Final Approval

Annexure 1 – Abbreviations

CAR	Corrective Action Request
CEA	Central Electricity Authority
CER	Certified Emission Reduction
CL	Clarification Request
CMS	Central Monitoring System
CO₂	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
CTPT	Current Transformer and Potential Transformer
DNA	Designated National Authority
EB	CDM Executive Board
EPC	Engineering Procurement and Construction
FAR	Forward Action Request
GHG	Greenhouse gas(es)
IPCC	Intergovernmental Panel on Climate Change
ISO	International Standardization Organization
JMR	Joint Meter Reading
JVVNL	Jaipur Vidyut Vitran Nigam Limited
NEWNE	North Eastern West North East
PD	Project Document
PLF	Plant Load Factor
PP	Project Participant
PPA	Power Purchase agreement
QC/QA	Quality control/Quality assurance
SEL	Suzlon Energy Limited
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCU	Verified Carbon Units
VER	Verified Emission Reduction
WTG	Wind Turbine Generators

Annexure 2- Reference section

Table 7-1: Documents provided by the project participant(s)

Document	Reference
Break down and maintenance records for the current monitoring period.	/BR/
Calibration certificates of the following meters issued by DISCOM details are mentioned in section 4.2 of this report.	/CAL/
Commissioning certificates for Project WTGs.	/CC/
ER calculation spreadsheet Version 01	/ER/
Generation at the Online meter for individual WTGs under the project activity for the monitoring period .	/GEN/
Invoices raised to Grid operator during the monitoring period i.e. 18-02-2012 to 30-12-2012	/INV/
Copy of ISO 9001:2008 for the O&M contractor (Suzlon Energy Limited valid upto 2015-04-13	/ISO/
Monthly JMR issued by JVVNL during the monitoring period i.e. 18-02-2012 to 30-12-2012 which provides the values for the sub-station.	/JMR/
MR Version 01 dated 29/07/2013 based on which verification is carried out. MR Version 02 dated 08/08/2013 which is an interim document. MR Version 03 dated 26/08/2013 based on which final opinion is provided.	/MR/
O&M contract dated with the equipment supplier.	/O&M/
Specific onsite organisation chart for the CDM project activity.	/OC/
Power Purchase Agreement for the project activity	/PPA/
Training records of the personal working onsite.	/TR/
Technical specification of the WTGs installed onsite.	/TS/

Table 7-2: Background investigation and assessment documents

Referen ce	Document

Reference	Document
/ACM0002/	Consolidated baseline methodology for grid-connected electricity generation from renewable sources, version 12.3.0
/CDM-PDD/	CDM PDD for the project “Kaladonger wind power project in Rajasthan” version 04 dated 2012/12/24.
/FVR-CDM/	Final validation report for CDM project “Kaladonger wind power project in Rajasthan” version 0 dated 24/12/2012, UNFCCC no. 9342
/VCS-PD/	VCS PD version 01 for the project activity dated 08-08-2013 VCS PD version 02 for the project activity dated 26-08-2013
/VCS/	Voluntary Carbon Standard version 3.3
/VVS/	UNFCCC Validation and Verification Standard (Version 3, EB 70 Annex 3)

Table 7-3: Websites used

Reference	Link	Organisation
/cea/	www.cea.nic.in	Central Electricity Authority
/unfccc/	http://cdm.unfccc.int	UNFCCC
/vcs/	www.v-c-s.org	Verified Carbon standard

Table 7-4: List of interviewed persons

Reference	Mol ¹		Name	Organisation / Function
/IM01/	V	☒ Mr. ☐ Ms	Anil Patel	Dy. Manager Mytrah Energy
/IM01/	E, T, V	☒ Mr. ☐ Ms	Anshu Yadav	Management Executive, Mytrah Energy Limited
/IM02/	V	☒ Mr. ☐ Ms	Avadhesh Upadhyay	Junior Eng, Suzlon Energy Limited

Reference	Mol ¹		Name	Organisation / Function
/IM02/	V	☒ Mr. ☐ Ms	Pratap Shekhawat	Engineer, Suzlon Energy Limited
/IM02/	V	☒ Mr. ☐ Ms	Prakash Ranjan Mohanta	Junior Eng, Suzlon Energy Limited
/IM02/	V	☒ Mr. ☐ Ms	Bharat Bhushan	Engineer, Suzlon Energy Limited
/IM02/	V	☒ Mr. ☐ Ms	Brajendra Nandan	Junior Eng, Suzlon Energy Limited
/IM02/	V	☒ Mr. ☐ Ms	Sneha Jaishankar	Associate Consultant, E&Y

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