

VERIFICATION REPORT 52.50 MW WIND ENERGY FARM AT MOKLA RAJASTHAN BY HZL



Bureau Veritas Certification Holding SAS
67/71 Boulevard du Château, 92200 Neuilly sur Seine, France

Project Title	52.50 MW Wind energy farm at Mokla Rajasthan by HZL
Version	01
Report ID	BVC/INDIA-VCS VER/612.49/2013

Report Title	Verification report of 52.50 MW Wind energy farm at Mokla Rajasthan by HZL
Client	Hindustan Zinc Limited
Pages	24
Date of Issue	08-January-2014
Prepared By	Bureau Veritas Certification Holding SAS
Contact	67/71 Boulevard du Château, 92200 Neuilly sur Seine, France Tél. : +33 (0)1 55 24 70 00 Fax : +33 (0)1 55 24 70 climatechange.ops@uk.bureauveritas.com www.bureauveritas.com
Approved By	Mr. Sanjay Patankar
Work Carried Out By	Mr. Anurag Juyal (Team Leader) Mr. Prabhavtar Singh (Team Member) Mr. Anupam Badola (Internal Technical Reviewer)

Summary:

Bureau Veritas Certification has made the Gap validation and verification of the “52.50 MW Wind energy farm at Mokla Rajasthan by HZL” project of **Hindustan Zinc Limited** located across Sonu, Mokla, and Serawa villages in Jaisalmer District of Rajasthan state in India on the basis of Verified Carbon Standard Version 3, 8 October 2013, v 3.4 as well as criteria given to provide for consistent project operations, monitoring and reporting.

The verification scope is defined as a periodic independent review and ex-post determination by the Designated Operational Entity of the monitored reductions in GHG emissions during defined verification period, and consisted of the following three phases:

- i) desk review of the project design and the baseline and monitoring plan;
- ii) follow-up interviews with project stakeholders;
- iii) Resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The project activity is to generate power (electrical energy) from renewable energy (wind energy), which displaces power generation from fossil fuel that would have been the scenario in absence of the project activity, thus achieve GHG emission reduction due to utilization of renewable energy.

The verification is based on the documents like Monitoring Report, Emission Reduction calculations and other supporting documents provided to the verification team. This verification is carried out in accordance with VCS Standard V.3, 8 October 2013 v 3.4 and VCS Program Guide V.3, 8 October 2013 v3.5.

In summary, Bureau Veritas Certification confirms that the project is implemented as planned and described in revised VCS PD and registered CDM PDD (UNFCCC no. 7895). Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project contributes towards GHG emission reductions. The GHG emission reduction is calculated without material mis-statements.

Table of Contents

1	Introduction.....	Error! Bookmark not defined.
1.1	Objective.....	Error! Bookmark not defined.
1.2	Scope and Criteria.....	Error! Bookmark not defined.
1.3	Level of assurance.....	Error! Bookmark not defined.
1.4	Summary Description of the Project.....	7
2	Verification Process.....	7
2.1	Method & Criteria.....	7
2.2	Document Review.....	7
2.3	Interviews.....	7
2.4.	Site Inspections.....	8
2.5.	Resolution of Findings.....	8
2.5.1	Forward action Requests.....	9
2.6	Eligibility for validation activities.....	9
3	Validation Findings.....	9
3.1	Participation under other GHG Programs.....	9
3.2	Methodology Deviations.....	11
3.3	Project Description Deviations.....	11
3.4	Grouped Project.....	11
4	Verification Findings.....	12

4.1	Project Implementation Status.....	12
4.2	Accuracy of GHG Emission Reduction & Removal Calculations.....	16
4.3	Quality of Evidence to Determine GHG Emission Reductions and Removals.....	16
4.4	Non-permanence Risk Analysis.....	17
5	Verification Conclusion.....	18
Annexure I: Details of corrective action and Clarifications Requested for the supplementary validation and verification.....		20
Annexure II: Documents referred during Verification and Validation of the Project Activity.....		24
Annexure III: List of Persons Interviewed.....		24
Annexure IV: Curricula Vitae of the DOE'S Validation and Verification Team Members.....		35

Abbreviations:

VER	Voluntary Emission Reduction
VCS	Verified Carbon Standard
VCU	Voluntary Carbon Unit
BMS	Bureau Veritas Certification's Management System
CAR	Corrective Action Request
CL	Clarification Request
FAR	Forward Action Request
CO ₂	Carbon Dioxide
DOE	Designated Operational Entity
DR	Document Review
GHG	Green House Gases
I	Interview
IETA	International Emissions Trading Association
MV	Means of Verification
MP	Monitoring Plan
MR	Monitoring Report
NGO	Non Governmental Organization
PD	Project Description
PDD	Project Design Document
UNFCCC	United Nations Framework Convention for Climate Change
CDM	Clean Development Mechanism
MU	Million Units
KW	Kilowatt
KWh	Kilowatt-hour
MW	Megawatt
MWh	Megawatt-hour
EF	Emission factor
PPA	Power Purchase agreement
JMR	Joint Meter Reading
CEA	Central Electricity Authority
PP	Project Participant
WEG	Wind Electricity Generator

1 INTRODUCTION

1.1 Objective

Verification is the periodic independent review and ex-post determination by the verifier of the monitored reductions in GHG emissions during defined verification period. The objective of the verification is to verify that the project is implemented as planned, to confirm that the monitoring system is in place and fully functional, and to assure that the project has generated verifiable emission reductions. This is the first verification of the project activity under VCS for the vintage from date on which actual emission reduction started i.e. 15/02/2011 (earliest date of commissioning of first WTG in the project activity) to 30/11/2012 (the date prior to the date of CDM registration). These emission reductions are verified as per the guidance provided by VCS standards version 3 dated 8 October 2013 v3.4.

The verification shall consider both qualitative and quantitative information on emission reductions. Quantitative data comprises the monitoring report and emission reduction calculations submitted to the verifier by the project participant and qualitative data comprises information on internal management controls, calculation procedures etc.

1.2 Scope and Criteria

The verification scope is defined as an independent and objective review of monitoring reports, revised VCS PD submitted for supplementary validation of the project as the project activity is already registered under CDM with UNFCCC, study of the monitored data and other relevant documents made available to verifier and information collected through performing interviews with the project Participant. The verification follows VCS Standard version 3 dated 8 October 2013 v 3.4. The verification is not meant to provide any consulting toward the client. However, stated request for forward actions and/or corrective actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.

1.3 Level of Assurance

Verification is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of emission reductions. Based on the process and procedure conducted, it can be concluded that the GHG assertion is materially correct and is a fair representation of GHG data and information which has been prepared in accordance with the VCS Standard 3.4 for the current verification period. The verification team considers the assurance level as 'limited' since some of the data used (E.g. Emission factor) are from the publicly available databases such as CEA database for emission factor of the grid, for which detailed testing of GHG assertion is beyond the domain of project proponent, stakeholders and the verification team.

1.4 Summary Description of the Project

The project activity involves the installation of Suzlon make 25 numbers Wind Electric Generator's (WEGs) of capacity 2.1 MW each (model S-88) located across villages Mokla, Sonu and Serawa in Jaisalmer district of Rajasthan state in India. The total capacity of the project activity is 52.50 MW and the entire power generated by the project activity will be exported to the NEWNE grid with a firm power purchase agreement with Jaipur Vidyut Vitran Nigam Limited.

The project is registered with the UNFCCC on 09/11/2012 (UNFCCC ref. no 7895) and can be viewed from the web link in the UNFCCC website (<http://cdm.unfccc.int/Projects/DB/DNV-CUK1351252642.79/view>). The project activity generates electricity using wind energy, which does not result in any greenhouse gas (GHG) emissions. Thus, this project activity leads to a reduction in GHG emissions that would otherwise have occurred when using electricity generated from conventional fossil fuel based sources in the NEWNE regional grid.

The electricity generated by the project activity is evacuated to RVPN substation at Amarsagar. The net electricity supplied to the grid is recorded in presence of PP's representative i.e. Suzlon and State Utility. The net electricity recorded at the RVPN substation also has a share from non-project WEGs and hence on the basis of meter readings taken at individual WEG controller, Suzlon apportions the net electricity among all the project developers.

The main and check meters are electronic tri-vector meters of 0.2s accuracy class. The meter reading is taken jointly by the representatives of Suzlon and State Utility in the form of JMR on a monthly basis.

2 VERIFICATION PROCESS

2.1 Method and Criteria

The overall verification, beginning from the Contract Review to Verification report & opinion, was conducted using Bureau Veritas Certification internal procedures. The project is already validated and registered as a CDM project with UNFCCC on 09/11/2012 (UNFCCC ref. no. 7895). The verification criteria followed by the project participant is based on the VCS standard Version 3. This is the first verification of the project activity under VCS for the vintage from date on which actual emission reduction started (15/02/2011, earliest date of commissioning of first WTG in the power activity) till 30/11/2012. These emission reductions are verified as per the guidance provided by VCS standard Version 3.

2.2 Document Review

This process consists of the review of the current and previously approved documents related to the project activity including validation report under CDM, registered CDM PDD and VCS PD. The current documents include the Monitoring report for the current verification period, emission reduction spreadsheet and other supporting documents (Monthly break-up sheet, JMR, calibration certificates, invoices, etc.) pertaining to the current verification period.

2.3 Interviews

The verification team from Bureau Veritas Certification conducted interviews with project stakeholders/consultants to confirm selected information and to resolve issues identified in the document review. Representatives of M/s Hindustan Zinc Limited were interviewed. The main topics of the interviews are summarized in Table below:

Interviewed organization	Interview topics
Mr. Vishnu Khandelwal M/s. Hindustan Zinc Limited	- QA/ QC Procedures - Internal review / verification mechanism - Emission reduction calculation procedures - Monitoring report - Emission reduction calculation procedures
Mr. Bhawar Singh- Junior Engineer – M/s Suzlon Energy Limited	- Project description - Operational aspects - Monitoring plans and Data recording procedures
Mr. Satish Sharma – CRM- M/s Suzlon Energy Limited	- Project description - Operational aspects - Monitoring plans and Data recording procedures

2.4 Site Inspections

This is the first periodic verification of the project activity. The physical site visit for the verification period was carried out by a single member verification team on 17/10/2013.

The verification team reviewed all the records of the sold electricity, break-up sheet, JMR reports (issued by the state electricity utility which is a government entity) calibration certificates and invoices for the current verification period (first periodic verification) and confirms that there is no change in the project design.

2.5 Resolution of Findings

The third step involves the resolution of the CAR/CL raised. Verification process also includes raising the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification before conclusion on the GHG emission reduction calculation.

Findings established during the initial verification could either be seen as a non-fulfilment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified. Corrective Action Requests (CAR) is issued, where:

- Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions, which will impair the estimate of emission reductions;
- Issues identified in a FAR during validation and/or 1st verification to be verified during subsequent verification have not been resolved by the project participants;
- The verification team may also use the term Clarification Request (CL), if information is insufficient or not clear enough to determine whether the applicable VCS requirements is met.
- To guarantee the transparency of the verification process, the concerns raised are documented in more detail in the verification protocol in Annexure 1.

The verification of the Project resulted in 10 Corrective Action Request and 00 Clarification Request.

The CARs and CLs were closed based on adequate responses from the Project Participant(s) which meet the applicable requirements. They have been reassessed before their formal acceptance and closure. The closure of CARs and CLs are discussed under Annexure 1 of the verification report.

2.5.1 Forward Action Requests

No forward action requests have been raised during this verification.

2.6 Eligibility for Validation Activities

Bureau Veritas holds accreditation for validation of the relevant sectoral scope.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

Project Design

The project activity is registered as CDM project activity by CDM-EB on 09/11/2012 (UNFCCC ref no 7895). The registered PDD was used during the course of supplementary validation and the technology used is validated at site as described in UNFCCC registered PDD.

The crediting period for the Certified Emission Reductions (CER) has started from 01/12/2012 as mentioned in the UNFCCC website (<http://cdm.unfccc.int/Projects/DB/DNV-CUK1351252642.79/view>).

The crediting period has been mentioned as 01/12/2012 to 30/11/2019 under CDM. Crediting period under VCS is from 15/02/2011 to 30/11/2012. The project participants have provided a declaration that the project shall not claim GHG emission reduction under VCS and CDM for the same vintage. Hence the project crediting period is acceptable to the VCS validation team.

The validation team validated the following points under the project design:

- **Project scope, type, technologies and measures implemented, and eligibility of the project**- The project activity is applicable to 'Scope Number 1, Sectoral Scope – Energy industries (renewable/non-renewable sources). This project activity involves generation of energy (electricity) using wind energy (renewable source) conversion systems, and hence conforms to category no. 1. The project has applied approved methodology ACM0002; Version 12 and the project activity is eligible to apply this methodology. The validation team has validated the correctness of these by reviewing the registered PDD, validation report, document review such as commissioning certificates and power purchase agreement as well as interview with the project participant.
- **Project proponent**- The project proponent for the project activity concerned is M/s Hindustan Zinc Limited. The validation team has reviewed the Host Country Approval to confirm this.
- **Project start date**- The start date for the project activity concerned is the earliest date of commissioning amongst the WTGs i.e. 15/02/2011. The validation has reviewed the commissioning certificate of all the WTGs to confirm this.
- **Project crediting period**- The project crediting period for the project activity concerned is from the earliest date of commissioning of the WTGs till the start of crediting period in CDM. Therefore, the crediting period for the project activity is from 15/02/2011 to 30/11/2012. The validation team

has reviewed the commissioning certificate of all the WTGs and date of registration from the UNFCCC website (<http://cdm.unfccc.int/Projects/DB/DNV-CUK1351252642.79/view>) to confirm this. Also the project participants has provided a declaration that the project shall not claim GHG emission reduction under VCS and the CDM for the same period. Hence the project crediting period is acceptable to the VCS validation team.

- **Project scale and estimated GHG emission reductions or removals**- The project activity is not a large scale project activity as the estimated annual GHG emission reduction is much less than 300,000 tCO₂e per year which is in line with paragraph 3.9.1 of the VCS standard Version 3 dated 8 October 2013 v.3.4. The validation team has validated the correctness of these by reviewing the registered PDD, validation report and emission reduction calculation sheet from the UNFCCC website (<http://cdm.unfccc.int/Projects/DB/DNV-CUK1351252642.79/view>).
- **Project activities**- In line with paragraph 3.11.9 of the Verified Carbon Standard Version 3 dated 8 October 2013 v.3.4; only a supplementary validation is to be carried out for 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 VCS PD for all projects registered under CDM. The project description is not included in these sections. Please refer to the registered PDD in UNFCCC, Project No. 7895 (<http://cdm.unfccc.int/Projects/DB/DNV-CUK1351252642.79/view>) for project description and how the validation team validated the accuracy of the project description.
- **Project location**- The project activity involves the installation of Suzlon make 25 numbers Wind Electricity Generator's (WEG) of capacity 2.1 MW each in villages Sonu, Mokla, and Serawa in the district of Jaisalmer in the state of Rajasthan, India. The validation team has validated the accuracy of the project location from registered PDD, validation report, document review such as commissioning certificates, power purchase agreement as well as interview with the project participant sand site visit conducted during validation of the project activity under VCS.
- **Project compliance with applicable laws, statutes and other regulatory frameworks**- In line with paragraph 3.11.9 of the Verified Carbon Standard Version 3 dated 8 October 2013 v.3.4; only a supplementary validation is to be carried out for 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 VCS PD for all projects registered under CDM. *The Project compliance with applicable laws, statutes and other regulatory frameworks is not included under these clauses.*
- **Ownership and other programs**
- **Right of use**- The validation team has reviewed the documents like power purchase agreement and commissioning certificate which substantiates the right of use for the concerned project activity.
- **Emissions trading programs and other binding limits**- India is a non Annex-I as recognised by the Kyoto Protocol which can be confirmed from the UNFCCC website (http://unfccc.int/parties_and_observers/parties/non_annex_i/items/2833.php). Hence, there are no GHG emission reduction targets or commitments for India and it does not fall under the purview of any compliance driven Emission Trading Programs. Furthermore, there are also no such voluntary emission trading programs similar to the VCS exist in India.
- **Participation under other GHG programs**- The WTGs under the project activity has applied for CDM registration and got registered on 09/11/2012 under UNFCCC CDM EB with project reference number – 7895 which can be confirmed from the UNFCCC website (<http://cdm.unfccc.int/Projects/DB/DNV-CUK1351252642.79/view>).
- **Other forms of environmental credit sought or received**- The WTGs under the project activity has applied for CDM registration and got registered on 09/11/2012 under UNFCCC CDM

EB with project reference number – 7895 which can be confirmed from the UNFCCC website (<http://cdm.unfccc.int/Projects/DB/DNV-CUK1351252642.79/view>). Thus it will earn revenue from CDM.

- **Rejection by other GHG programs**- The project activity has applied for CDM registration and got registered on 09/11/2012 under UNFCCC CDM EB. Other than CDM, the project activity has not being applied under other GHG programs like Gold Standard which can be confirmed from the website <http://www.cdmgoldstandard.org/our-projects/project-registry> and hence the project activity is not rejected under other GHG programs.

• Additional information relevant to the project

- **Eligibility criteria for grouped projects**- The project activity is not a grouped projects which can be confirmed from registered PDD, validation report, HCA and interview with the project participant.
- **Leakage management for AFOLU projects**- The concerned project is a wind project activity and hence is not an AFOLU project.
- **Commercially sensitive information**- There is no commercially sensitive information that has been excluded which the validation team confirms from the document review and interview with the project participant.
- **Any further information**- There is no additional information that may have a bearing on the eligibility of the project, the net GHG emission reductions or removals, or the quantification of project's site specific net GHG emission reductions or removals which the validation team confirms from the document review and interview with the project participant.

3.2 Methodology Deviations

There were no deviations from the referred methodology ACM0002; Version 12 as compared to UNFCCC registered PDD and Registered Validation Report. Hence the validation team could conclude that the project activity does not require any deviation from the Methodology referred.

Project Description Deviations

Not applicable

New Project Activity Instances

Not applicable

3.3 Project Description Deviations

The verification team had identified some discrepancies in the monitoring plan described in the CDM registered PDD and the corrective actions/clarifications was raised (Refer Appendix I) subsequently. The project participant revised the monitoring plan by excluding some of the monitored parameters which did not have any significant impact on computation of Emission Reductions. In fact, Project participant's consideration of only 3 monitoring parameters like EG_y , $EG_{y,import}$ and $EG_{PJ,y}$ which are also stipulated by the approved methodology ACM0002 version 12.3 results in more accurate values of Emission reductions.

The revised monitoring plan is included in the VCS-MR during the verification stage. The verification team validated and confirms that the revised monitoring plan is in accordance with the

applied methodology and by exclusion of some of the parameters like X, Y, A and B the emission reductions achieved will reflect the actual practice being followed in the project activity.

Bureau Veritas Certification hereby confirms in line with requirement as stipulated in paragraph 3.6.2 of VCS Standard Version 3, v3.4 published on 8/10/2013, that this deviation does not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario as described in CDM registered PDD and project remains in compliance with the VCS rules.

3.4 Grouped Project

Not applicable as this is not a grouped project. Please refer to the registered PDD in UNFCCC, Project No. 7895 (<http://cdm.unfccc.int/Projects/DB/DNV-CUK1351252642.79/view>) for project description and how the validation team validated the accuracy of the project description.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

From the site visit performed, the verification team is able to conclude that all the twenty five Wind Energy Generators (WEGs) each of capacity 2.1 MW as stated in the registered PDD have been commissioned and are in operation. The WEGs are located across villages Mokla, Sonu and Serawa in Jaisalmer district of Rajasthan state in India. The total capacity of the project activity is 52.50 MW and the entire power generated by the project activity will be exported to the NEWNE grid with a firm power purchase agreement with Jaipur Vidyut Vitran Nigam Limited

The commissioning dates of the wind turbines were confirmed by checking the commissioning certificates of each WEG. All the equipments as described in the registered CDM PDD have been installed at the project site. The electricity exported to the grid and imported from the grid is recorded at the state utility substation which also included electricity supplied by non-project WEGs.

Apart from recording of electricity at sub-station, the electricity exported to the grid is also recorded through LCS meters located on each WEG based on which the Suzlon calculates the share of each project owner in the electricity supplied which is recorded at the substation.

The WEG location nos. and the commissioning dates of the WEGs are tabulated below:

LOCATION No	Date of commissioning	Connected Load (MW)	Phase
MK-49,63,100,101,168	15/02/2011	10.5 MW	Ph I
MK-18,19,20,38,53,64,65,87,88,218, 219, 220	13/03/2011	25.2 MW	Ph I
MK-162	16/08/2011	2.1 MW	Ph II
MK- 32,33,34,35	01/09/2011	8.4 MW	Ph II
MK 24,25	22/09/2011	4.2 MW	Ph II
MK- 182	30/09/2011	2.1 MW	Ph II

The meter numbers and the calibration details of energy meters installed at substation is crosschecked by the calibration certificates issued by C & I Systems-

Sr. No	Meter type	Meter Serial No.	Make	Accuracy class	Last Calibration date	Current Calibration date	Current Calibration date
1	Main meter Line 1	9166170	L & T	0.2s	14/03/2011	13/03/2012	12/12/2012
2	Back up meter Line 1	9166172	L & T	0.2s	14/03/2011	13/03/2012	12/12/2012
3	Main meter Line 2	MSB 60428	Secure meter Ltd	0.2s	-	13/03/2012	17/12/2012
4	Back up meter Line 2	MSB 60429	Secure meter Ltd	0.2s	-	13/03/2012	17/12/2012

The PP has operated the Project as per the registered CDM PDD. The monitoring organization has been set up and all monitoring staffs have been trained. Meter reading records of all the meters are based on continuously measurement and monthly recorded by the PP.

Compliance of monitoring plan with the monitoring methodology

The verification team has verified the monitoring plan, including the data and parameters required to be monitored, measurement procedures, monitoring frequency and QC/QA procedures as described in the registered PDD.

The project activity is registered with methodology ACM0002 version 12 according to which the net electricity supplied to the Grid by the renewable energy technology i.e. electricity exported by the project activity to the Grid and the electricity imported from the grid is to be monitored and measured. Accordingly, the monitoring plan of the registered PDD indicates that the net electricity supplied to the Grid by the project activity ($EG_{PJ,y}$) is monitored.

The electricity generation is monitored through electronic tri-vector meter installed at state utility's substation and controller at each WEG. The meters installed at substation are with an accuracy class of 0.2s.

The grid emission factor (**0.9487** tCO₂/MWh) has been fixed ex-ante for the entire crediting period in the registered PDD.

Hence the verification team concluded that no deviation request or revision request is required for the current monitoring period.

Compliance of monitoring activities with monitoring plan

The parameters required by the monitoring plan and how Bureau Veritas Certification has verified the information flow (from data generation, aggregation, to recording, calculation and reporting) for these parameters in the monitoring report are described below:

Sr. no.	Parameter	Data information flow
(1)	Sum of gross electricity exported by all 25 WEGs of project activity connected to substation of the state utility ($EG_{y,Export}$)	The verification team noted that the wind farm at the project site includes WEGs owned by both PP and non-PP. All the WEGs in the wind farm supply electricity to a common pooling substation where the electricity exported by the entire wind farm is measured through a common set of meters. On a particular day of a month, joint meter reading is taken at the grid interconnection point viz. the pooling substation by representatives of the state utility and the PP. Based on the controller meter readings taken at individual WEG, a break up sheet is prepared to apportion the electricity exported by a particular developer. <i>Based on the above, the verification team concludes that the monitoring of electricity exported by the entire project WEGs in the wind farm is in line with the provision described in the revised monitoring plan.</i>
(2)	Electricity imported from the grid by the project activity ($EG_{y,Import}$)	The verification team noted that the wind farm at the project site includes WEGs owned by both PP and non-PP. All the WEGs in the wind farm supply electricity to a common pooling substation where the electricity imported by the entire wind farm is measured through a common set of meters. On a particular day of a month, joint meter reading is taken at the grid interconnection point viz. the pooling substation by representatives of the state utility and the PP. Based on the controller meter readings taken at individual WEG, a break up sheet is prepared to apportion the electricity imported by a particular developer. <i>Based on the above, the verification team concludes that the monitoring of electricity exported by the entire project WEGs in the wind farm is in line with the provision described in the revised monitoring plan.</i>
(3)	Net electricity supplied by the WEGs in the project activity to the grid ($EG_{PJ,y}$)	The monitoring of this parameter as stated in the PDD and observed during the site visit is as follows- The wind farm at the project site includes WEGs owned by both PP and non-PP. All the WEGs in the wind farm supply electricity to a common pooling substation where the electricity supplied by the entire wind farm is measured through a common set of meters. Electricity supplied by each WTG is measured both at the WTG end as well as the pooling substation i.e. grid interconnection point. On a particular day of a month, joint meter reading is taken at the grid interconnection point viz. the pooling substation

		by representatives of the state utility and the PP. Since the electricity measured at the pooling substation represents the electricity supplied by the entire wind farm, hence a break up sheet is prepared by the technology supplier viz. Suzlon to calculate the electricity supplied by each project developer in a particular month and sent to respective project owners. The break-up sheet is prepared on the basis on the basis of readings taken at WTG end as well as the pooling substation. Based on the value in the break-up sheet, the PP raises an invoice to state utility. The invoice is used as a cross-check for the electricity supplied to grid. <i>Based on the above, the verification team concludes that the monitoring of net electricity supplied from the grid by the project activity is in line with the provision described in the revised monitoring plan.</i>
--	--	--

Compliance with the calibration frequency requirements –

All the meters installed at the substation have followed a calibration frequency of once in a year. From the calibration certificate submitted it was observed that the all the meters were operating within accuracy limit.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

Calculation procedure of baseline emissions, project emissions and leakage

	Calculation procedure
Baseline emissions	Baseline emission calculations have been done in the monitoring report as per the following equation - $BE_y = EG_{PJ,y} * EF_{grid,CM,y}$ Where – BE_y – Baseline emissions $EG_{PJ,y}$ – Net electricity supplied by the WEGs in the project activity to the grid $EF_{grid,CM,y}$ – Combined margin CO₂ emission factor for NEWNE regional grid The above mentioned calculation procedure is in line with the procedure described in the registered PDD.
Project emissions	Not applicable since there are no emissions attributed to the project activity outside the project boundary.
Leakage	Not applicable since there are no emissions attributed to the project activity outside the project boundary.

The verification team confirms that appropriate methods and formulae for calculating baseline emissions have been followed.

Emission factor and default values

Baseline emission factor of NEWNE regional grid - The emission factor taken for the calculation of baseline emissions (0.9487 tCO₂/MWh) is determined ex-ante and fixed for the crediting period. The same is in line with the registered PDD.

The verification team confirms that the emission factor is in line with the requirement of the applied methodology and associated tools.

Bureau Veritas Certification confirms that:

- Data used for the determination of the emission reductions are available and monitored in accordance with the monitoring plan contained in the registered PDD.
- Information and data provided in the monitoring report have been cross-checked with other sources such as plant logbooks, inventories, purchase records, laboratory analysis.
- Appropriate methods and formulae for calculating baseline emissions, project emissions and leakage have been followed.
- Assumptions, emission factors and default values that were applied in the calculations have been justified.

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

As per the monitoring plan of the registered PDD, the following complete data set was required for the specified monitoring period to calculate the GHG emission reductions resulting from the project activity-

<i>Baseline emission</i>	
Parameter	Source
<i>Net electricity supplied by WEGs in the project activity to the grid (EG_{PJ,y})</i>	<u><i>Statement on Break-up of Net Export Units prepared by the O&M Service provider</i></u> All the break-up sheet showing the energy supplied by the project activity wind mills for the current monitoring period have been cross-checked by the verification team. The value in the statement is aggregated to calculate the net electricity exported to the grid by the project activity. The PP has included a separate worksheet in the ER calculation spreadsheet, which mentions monthly statement readings for the project activity for the current monitoring period separately for each billing month.

The verification team confirms that complete data set for all the above mentioned monitored parameters is available for the current monitoring period and hence any theoretical assumption or request for deviation was not required before submitting the request for issuance.

Cross check of information in monitoring report

The information in the monitoring report has been cross-checked through other documentary evidence as explained below:

Baseline emission	
Parameter	Cross-check Source
Net electricity supplied to the grid by the project (EG_{P,V})	The value of net electricity supplied to the grid as reflected in the monthly statements has been compared with the invoices submitted to State Utility.

Bureau Veritas confirms that the data considered for GHG emission reduction calculation is sufficient in quantity and appropriateness of quality.

4.4 Non-Permanence Risk Analysis

Bureau Veritas Certification confirms that the project is implemented as described in the validated and registered project design documents. Installed equipments being essential for generating emission reductions run reliably and are calibrated appropriately. The monitoring system is in place and the Project is generating GHG emission reductions as a CDM project. The data used for calculation of ERs is from a authentic source and is measured jointly by the state utility. Emission factor is calculated from CEA (Central Electricity Authority), Ministry of Power, Government of India.

5 VERIFICATION CONCLUSION

The verification scope is an independent and objective review of the VCS Project description, the project's baseline study and monitoring plan and other relevant documents. The review is to verify the implementation of monitoring plan as defined in validated VCS PD. The period for verification is from 15/02/2011 to 30/11/2012 (inclusive of both the days).

The verification of the monitored data indicates the emission reductions and the amount for emission reductions for the monitoring period are provided below.

Verification period: From [15-February-2011] to [30-November-2012]

Verified GHG emission reductions and removals in the above verification period:

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
15/02/2011 – 31/12/2011	54123.82	0	0	54123.82
01/01/2012 - 30/11/2012	78769.86	0	0	78769.86
Total	132893 (rounddown)	0	0	132893

The calculations of emission reductions are found to be correct. The baseline EF of the NEWNE regional grid has been taken for arriving at baseline emissions. The grid emission factor of 0.9487 tCO₂e/MWh for NEWNE regional grid was found to be correct.

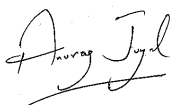
Appropriate procedures for maintaining the confidentiality and safe custody of the validation or verification documentation and for retaining them for a sufficient period to meet the needs of the client, the responsible parties, the GHG programmes to which they subscribe, and in accordance with legal and professional requirements of record retention have been established.

The verification team confirms that the project is implemented as planned and described in the Registered PDD with UNFCCC under CDM and revised PD. The monitoring mechanism is effective and reliable. The reported data are accurate and correct based on all the records provided to the verification team during the verification as provided in annexure-III. The installed equipments being essential for generating the emission reductions run reliably and the measuring equipments/instruments are calibrated.

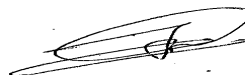
Reporting period: 15/02/2011 to 30/11/2012

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

GHG Emission Reductions or Removals	tCO ₂ e
Baseline Emissions	132893
Project Emissions	0
Leakage	0
Net GHG emission reductions or removals	132893



Anurag Juyal
(Team Leader)
08/01/2014



Anupam Badola
(Internal Technical Review)
08/01/2014

APPENDIX I: DETAILS OF CORRECTIVE ACTIONS AND CLARIFICATIONS REQUESTED FOR THE SUPPLEMENTARY VALIDATION AND VERIFICATION

Resolution of Corrective Action / Forward Action / Clarification Requests.

Draft report clarifications and corrective action requests by verification team	Reference to section of PD/MR	Summary of project owner response	Verification team conclusion
<u>CAR 1</u> The information provided in section 1.1 of the VCS PD is not as per requirement of section 3.11.9 of the VCS Standard, v3.4. Same comment is applicable for the entire VCS-PD.	VCS PD 1.1	The information in the section 1.1 of the VCS PD has been updated in VCS- PD version 02.	The information included in section 1.1 is as per registered CDM PDD and site visit observations. <i>Hence CAR 1 is closed.</i>
<u>CAR 2</u> Reasons for not filling some of the sections in VCS PD is not clearly stated viz. Section 1.4 of the PD. Same comment is applicable for the entire VCS-PD.	VCS PD 1.4	The section 1.4 of the VCS PD has been updated in VCS PD version 02.	The PD has been revised in line with the comment. <i>Hence CAR 2 is closed.</i>
<u>CAR 3</u> Total number of years of crediting period is not stated in section 1.6. Section 1.7 of the VCS-PD is not filled as guidelines of VCS project Description.	VCS PD 1.6 & 1.7	Total no of years in section 1.6 has been updated in VCS PD version 02. Section 1.7 of the VCS-PD has been updated in VCS PD version 02.	Total number of crediting period is now stated in section 1.6 of the VCS-PD. Section 1.7 of the VCS-PD is now filled as per guidelines of VCS project description. <i>Hence CAR 3 is closed.</i>
<u>CAR 4</u> In section 2.1 of the MR, implementation status is specified only for 23 WTGs. Please explain.	MR Section 2.1	Details of the implementation status of the all the machine has been updated in the VCS MR version 02.	Implementation status of all 25 WEGs has been stated now in section 2.1. <i>Hence CAR 4 is closed.</i>

Draft report clarifications and corrective action requests by verification team	Reference to section of PD/MR	Summary of project owner response	Verification team conclusion
<u>CAR 5</u> In section 3.3 of the MR, the grid emission factor is specified as 0.9488 tCO₂/MWh. The same is not in accordance with registered PDD. Same comment is applicable for the entire VCS-MR.	MR Section 3.3	The grid emission factor has been corrected as the registered PDD in VCS-MR version 02.	The grid emission factor has been corrected to 0.9487 tCO₂/MWh in the entire MR. <i>Hence CAR 5 is closed.</i>
<u>CAR 6</u> In section 3.3 of the monitoring report, the Procedure for calculation of Net Electricity Supplied by the Project Activity is not included.	MR Section 3.3	The Procedure for calculation of Net electricity supplied by the project activity has been included in the VCS-MR version 02.	The procedure for calculation of net electricity supplied by the project activity is now included in the MR. <i>Hence CAR 6 is closed.</i>
<u>CAR 7</u> Raw data related to monitoring has been included in section 4.1 of monitoring report. However, as per the template of Monitoring Report, Section 5 of the MR may include any raw data from monitoring, additional information used in the monitoring plan, documentation of activities conducted from the monitoring plan, diagrams, etc.	MR Section 4.1	The raw data related to monitoring and ER calculation has been included in section 5 in VCS MR version 2.	Raw data related to monitoring has now been included in the monitoring report. <i>Hence CAR 7 is closed.</i>
<u>CAR 8</u> In Annexure 1 of the MR, calibration details for energy meters installed at substation are not provided for period before the start of monitoring period and after the end of the monitoring period.	MR Annexure-1	Calibration details for the periods before and after the monitoring period have been provided.	Details of calibration carried out on 14/03/2011 has been included in MR. The calibration was carried out after the start of monitoring period i.e. 15/02/2011. The results of calibration was OK and hence it can be assumed that the meters were working appropriately between 15/02/2011 to 14/03/2011.

Draft report clarifications and corrective action requests by verification team	Reference to section of PD/MR	Summary of project owner response	Verification team conclusion
			The next calibration was performed on 13/03/2012, 12/12/2012 and 17/12/2012 and hence after the end of monitoring period. Hence CAR 8 is closed.
<u>CAR 9</u> No information is provided in Annexure-2 of the MR.	MR Annexure-2	Annexure 2 has been removed in revised MR of version 2.	Annexure 2 has been removed from the revised MR. Hence CAR 9 is closed.
<u>CAR 10</u> In the ER spreadsheet, the values provided for export and import of electricity do not match with the break up sheet submitted.	ER Spreadsh eet	The values have been corrected in revised ER spreadsheet.	In the ER spreadsheet, values provided for export & import of electricity now matches with the break-up sheet submitted. Hence CAR 10 is closed.

APPENDIX II - DOCUMENTS REFERRED DURING VERIFICATION AND VALIDATION OF THE PROJECT ACTIVITY

// 1//	VCS Monitoring Report, version 02.2, dated 07/01/2014
// 2//	VCS Project Document , version 02.2, dated 07/01/2014
// 3//	Final CDM PDD registered with UNFCCC under CDM vide project reference no. 7895
// 4//	Validation report registered with UNFCCC under CDM with reference no. 7895
// 5//	Estimated Emission Reduction Calculation Sheet as per registered project reference no. 7895
// 6//	Verified Carbon Standard Version 3 dated 8 October 2013 v.3.4
// 7//	VCS Validation and Verification Manual Version 3.1 dated 8 October 2013
// 8//	Clean development mechanism validation and verification standard, Version 04 EB 74 Annex 04
// 9//	Host Country Approval Letter for the project activity vide reference No. 4/5/2012-CCC dated 14/09/2012
// 10//	Proof of registration as CDM Project activity http://cdm.unfccc.int/Projects/DB/DNV-CUK1351252642.79/view
// 11//	Commissioning certificate for all the WTGs of the proposed project activity
// 12//	Power Purchase Agreement of the project activity signed between Suzlon Infrastructure Services Limited and Hindustan Zinc Limited dated 04/02/2011 and 22/06/2011
// 13//	Break up sheet based on JMR for the monitoring period
// 14//	Invoice raised by Hindustan Zinc Limited to Jaipur Discom for the monitoring period
// 15//	Calibration certificates of all the main and check meters
// 16//	Undertaking from Hindustan Zinc Limited dated 10/11/2013 that the project shall not claim GHG emission reduction under VCS and CDM for the same period

APPENDIX III: LIST OF PERSONS INTERVIEWED

List persons interviewed during the verification process or persons that contributed with other information that are not included in the documents listed above.

/1/	Mr. Bhanwar Singh	Junior Engineer, Suzlon Energy Limited
/2/	Mr. Satish Sharma	CRM, Suzlon Energy Limited
/3/	Mr. Vishnu Khandelwal	CDM Cell, Hindustan Zinc Limited

APPENDIX IV: CURRICULA VITAE OF THE DOE'S VALIDATION AND VERIFICATION TEAM MEMBERS

Mr. Anurag Juyal - Team Leader

Bureau Veritas Certification (India), Lead Verifier - Climate change

Mr. Anurag Juyal is a Post-graduate in Energy Systems with around 6 years of experience in the field of climate change services. He is working in Bureau Veritas Certification (India) Pvt. Ltd. as Verifier-Climate Change. Prior to joining Bureau Veritas, he worked on GS/CDM/VCS projects as a consultant. He has received extensive training in CDM validation and verification processes and participated in assessment of CDM projects.

Mr. – Prabhavtar Singh - Team Leader

Bureau Veritas Certification (India), Lead Verifier - Climate change

He has a Bachelors of Technology degree in Mechanical Engineering and Masters of Business Administration degree in Energy and Finance. Has 2 years of experience in manufacturing industry in functions like Quality, Process validation and QMS. Has over 2.5 year of experience in CDM/VCS. Has worked on various Wind, Hydro and Biomass based cogeneration projects. He has undergone training related to Clean Development Mechanism. Working for the last 1.5 years in Bureau Veritas Certification (India) Pvt. Ltd. as Verifier – Climate Change and currently involved in validation and verification of CDM projects.

Mr. Anupam Badola – Internal Technical Reviewer

Bureau Veritas Certification (India), Lead Verifier - Climate change

Mr. Anupam Badola is Post Graduate in Environmental Science with five years of work experience in climate change services. He has previously worked with a manufacturing organization and a carbon advisory firm in India on CDM project development, CDM project due diligence, stack, ambient air pollution monitoring, water pollution monitoring, etc. He has undergone intensive training on Clean Development Mechanism and involved in the Validation and verification of CDM/VCS projects.