VERIFICATION REPORT

for the VCS project activity

15 MW GRID CONNECTED RENEWABLE ENERGY WIND TURBINE PROJECT IN KARNATAKA

(2nd Verification)

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Summary:

The verification team assigned by the DOE (TÜV Rheinland (China) Ltd.) concludes that the VCS Project Activity "15 MW Grid Connected Renewable Energy Wind Turbine Project In Karnataka" in India, as described in the validated VCS-PD (version 04, date 10/11/2009) and monitoring report (version 02, date 25/02/2013), meets all relevant requirements of the VCS standard version 3.3. The verification is conducted in-line with the VCS validation verification manual (version 03) requirements.

Verification methodology and process

The verification has been performed as described in the VCS validation and verification manual, version 03.0 and constitutes the following steps:

- Desk review of the MR and the relevant documents
- On-site assessment (23/01/2013)
- Issuance of Verification Report

The project activity was correctly implemented according to selected monitoring methodology and monitoring plan. The monitoring equipment was installed, calibrated and maintained in a proper manner, while collected monitoring data allowed to verify the amount of achieved GHG emission reductions. The DOE therefore is pleased to issue a positive verification opinion.

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1 INTRODUCTION

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;
- to assess the implementation of the monitoring plan (MP) content in the VCS-PD;
- 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 establish 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.

1.2 Scope and Criteria

The verification of this project is based on the validated project design document /VCS-PD/, 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. Furthermore publicly available information was considered as far as available and required.

The TRC 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.

1.3 Level of assurance

The verification has been planned and organized to achieve a

☒ Reasonable level of assurance

☐ Limited level of assurance

1.4 Summary Description of the Project

The project activity involves generation of renewable electricity through operation of 20 windmills with the installed capacity of 15 MW (5*0.6 MW & 15*0.8 MW). This project is equipped with the WTGs developed by Enercon make. The project employs 600 kW (E-40) and 800 kW (E-48) turbines of Enercon make for power generation. The Project leads to reduce greenhouse gas (GHG) emissions because it displaces electricity from fossil fuel based electricity generation plants. Thus the project is ultimately leading to sustainable economic and environmental development.

The key parameters of the project are given below:

Parameter	Unit	Value (E 40)	Value (E 48)
Number of machine		5	15
Rated power	kW	600	800
Rotor diameter	M	48	48
Hub height	M	74.85	56.85
Turbine Type		Gearless horizontal axis wind turbine with variable rotor speed	Gearless horizontal axis wind turbine with variable rotor speed
Design lifetime	Years	20	20
Cut-in wind speed	m/s	2.5	2
Rated wind speed	m/s	12	14
Extreme Wind Speed	m/s	59.5	59.5
Rated rotational speed	Rpm	31.5	31.5
Operating range rot. speed	Rpm	16.0 - 31.5	16.0 - 31.5
Orientation		upwind	upwind
No of blades		3	3
Blade Material		Glass Fibre reinforced Epoxy	Glass Fibre reinforced Epoxy
Gear box type		Gearless	Gearless
Generator type		Synchronous generator	Synchronous generator
Braking		Aerodynamic	Aerodynamic
Output Voltage	V	400	400

The technical specification of the WTGs are verified through the technical specification of the WTGs and also confirmed during site visit.

2 VALIDATION PROCESS, FINDINGS AND CONCLUSION

2.1 Validation Process

The project is already registered under VCS with the project ID: VCSR316, further for above points, please refer to VCS Final Validation report of "15 MW Grid Connected Renewable Energy Wind Turbine Project In Karnataka" dated 10/11/2009 by TÜV Rheinland (China) Ltd and submitted to VCSA.

2.2 Validation Findings

2.2.1 Gap Validation

Not applicable as the project is already validated.

2.2.2 Methodology Deviations

Not applicable as the project is already validated.

2.2.3 Project Description Deviations

Not applicable as the project is already validated.

2.2.4 New Project Activity Instances

Not applicable as the project is already validated.

2.3 Validation Conclusion

Not applicable as the project is already validated.

3 VERIFICATION PROCESS

3.1 Method and Criteria

The verification of the project consisted of the following steps:

1. Completeness check and webhost of the Monitoring report;

2. Desk review of the monitoring plan, monitoring report, monitoring methodology, project description, applicable tools in particular attention to the frequency of measurements, quality of metering equipment's including calibration requirements, QA/QC procedures and other relevant documents;

3. On-site visit (including follow-up interviews with project stakeholders, when deemed necessary). The on-site assignment includes the following;

- An assignment of implementation and operation of project activity with respect to validated VCS-PD or approved revised VCS-PD;
- Review of information flows for generating, aggregating and reporting the monitoring parameters;

- Interview with relevant personals to determine whether the operational and data collection procedures are implemented and in accordance with monitoring plan of the VCS-PD;
- Cross check of information and data provided in the monitoring report with plant logbooks, inventories, purchase records or similar data sources;
- Check of monitoring equipment's, calibration frequency and monitoring practice in-line with methodology and VCS-PD;
- Review of assumptions made in calculating the emission reduction;
- Implementation of QA/QC procedure in-line with the VCS-PD and methodology requirement.

4. Resolution of outstanding issues and the issuance of the final Verification report and Certification statement.

The following sections outline each step in more detail.

3.2 Document Review

The following table outlines the documentation reviewed during the verification:

<table>
<tr><th colspan="2">Ref no.</th><th>Reference Document</th></tr>
<tr><td rowspan="2">/P1/</td><td>/P1.1/</td><td>VCS monitoring report, version 01 dated 09/01/2013</td></tr>
<tr><td>/P1.2/</td><td>VCS monitoring report, version 02, dated 25/02/2013</td></tr>
<tr><td rowspan="2">/P2/</td><td>/P2.1/</td><td>ER calculation sheets (draft), version 01, wrt monitoring report version 01</td></tr>
<tr><td>/P2.2/</td><td>ER calculation sheet (Final), version 02, wrt monitoring report version 02</td></tr>
<tr><td colspan="2">/P3/</td><td>Monthly joint meter reading statement (B-Form) for the monitoring period</td></tr>
<tr><td colspan="2">/P4/</td><td>Invoice copies submitted to the BESCOM for the sale of power for the monitoring period</td></tr>
<tr><td colspan="2">/P5/</td><td>Calibration certificates of the energy meters involved in the monitoring of the project activity covering the monitoring period
<table>
<tr><th>Meter No.</th><th>MMCL05</th><th>ELP39</th><th>VVS28</th><th>ELP20</th></tr>
<tr><td>Calibration dates</td><td>03/09/2012
06/09/2011
07/09/2010
04/12/2009</td><td>15/05/2012
23/02/2012
15/11/2011
08/07/2011
21/04/2011
15/12/2010
10/08/2010
29/02/2010</td><td>08/06/2012
08/03/2012
19/12/2011
24/09/2011
23/06/2011
15/03/2011
09/12/2010
12/07/2010
26/04/2010</td><td>15/05/2012
18/02/2012
21/11/2011
29/07/2011
18/04/2011
11/01/2011
28/09/2010</td></tr>
</table></td></tr>
<tr><td colspan="2">/P6/</td><td>Power Purchase Agreement between Bangalore Electricity Supply Company Limited and Mineral Enterprises Limited dated 27th February 2006.

Power Purchase Agreement between Bangalore Electricity Supply Company Limited</td></tr>
</table>

	and Mineral Enterprises Limited dated 4th April 2006. Power Purchase Agreement between Bangalore Electricity Supply Company Limited and Mineral Enterprises Limited dated 14th June 2006.
/P7/	Internal quality assurance and quality control records and procedures of Enercon India
/P8/	Daily energy generation reading of individual wind mills taken from SCADA
/P9/	Commissioning certificate of ELP-20 for the synchronisation done on 31/03/2006 Commissioning certificate of ELP-39 for the synchronisation done on 31/03/2006 Commissioning certificate of MMCL-05 for the synchronisation done on 17/09/2005 Commissioning certificate of VVS-28 (1) for the synchronisation done on 30/09/2004 Commissioning certificate of VVS-28 (2) for the synchronisation done on 28/10/2004

Background investigation and other referred documents/websites:

Reference	Document
/B1/	Approved CDM Methodology AMS I D, version 13: "Grid connected renewable electricity generation"
/B3/	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book
/B4/	Greenhouse gases – Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals Greenhouse gases – Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements Greenhouse gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions
/B5/	Greenhouse gases – Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition
/B6/	Voluntary Carbon Standard, version 03
/B7/	VCS PD Template, version 3.2
/B8/	VCS Validation and Verification Manual, version 03.0
/B9/	VCS Validation documents: Validated VCS-PD, version 04, dated 10/11/2009 VCS Validation report, dated 10/11/2009

3.3 Interviews

TÜV Rheinland verification team carried out an on-site visit dated (23/01/2013) and performed interviews with the project representatives and stakeholders.

Prior to the interview salient points to be discussed were planned. Date of interview, interviewee and points discussed are given in the following table.

	Date	Name	Organization	Topic
/i/	23/01/2013	Mr. Sanjay	Mineral Enterprises Limited	Project implementation, operation, training, Calibration, Monitoring and data archiving, Data trail (information flow) till the reported values. CER calculation, Outage, Consents and statutory clearances.
/ii/	23/01/2013	Mr. Girish Nandan	Mineral Enterprises Limited	
/iii/	23/01/2013	Mr. Lohith	Enercon India	
/vi/	23/01/2013	Mr. Srinath Anekal	ClimateSD Services	Project implementation, operation, training, Calibration, Monitoring and data archiving, CER calculation.

Verification Team along with onsite observation, objective evidence collections, data generation and recording analysis also considered the views obtained in these interviews while arriving at Verification Opinion.

3.4 Site Inspections

The verification team has carried out an inspection on site on 23/01/2013 in order to verify that the project is implemented in accordance with the applicable criteria. Furthermore the on-site assessment was conducted and monitoring data were checked with respect to accuracy to ensure the calculation of emission reductions. The main tasks covered during the site visit include,

- The on-site assessment included an investigation of whether all relevant equipment is installed and works as anticipated.
- The operating staff was interviewed and observed in order to check the risks of inappropriate operation and data collection procedures.
- Information processes for generating, aggregating and reporting the selected monitored parameters were reviewed.
- The duly calibration of all metering equipment was checked.
- The monitoring processes, routines and documentations were audited to check their proper application.
- The monitoring data were checked completely.
- The data aggregation trails were checked via spot sample down to the level of the meter recordings.

Responsibilities related to monitoring are executed as defined in the monitoring plan[/P1/ & /P2/] and were assessed.

3.5 Resolution of Any Material Discrepancy

The objective of this phase of the verification is to resolve any outstanding issues (issues that require further elaboration, research or expansion) which have to be clarified prior to final DOE's conclusions on the project implementation, monitoring practices and achieved emission reductions. In order to ensure transparency a verification protocol is completed for the project activity. The protocol shows in transparent manner criteria (requirements), means of verification and resulting statements on verification actual project activity against identified criteria.

The verification protocol serves the following purposes:

- It organises in a table form, details and clarifies the requirements, which VCS project is expected to meet VCS requirements;
- It ensures a transparent verification process where the DOE will document how a particular requirement has been verified and the result of the verification.
- It ensures that the issues are accurately identified, formulated, discussed and concluded in the validation report.
- It ensures the determination of achieving credible emission reductions from the project activity.

Findings during the verification can be interpreted as a non-compliance with VCS criteria or a risk to the compliance. Corrective action requests (CARs) are raised, in case:

(a) Non-conformities with the monitoring plan or methodology are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;
(b) Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;
(c) Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
(d) Issues identified in a FAR during validation/previous verification(s) that are not been resolved by the project participant(s) to be verified during current verification.

Requests for clarification (CLs) are raised, if information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met.

A forward action request (FAR) is raised during verification to highlight issues related to project implementation/monitoring that require review during the subsequent verification of the project activity. FARs shall not relate to the VCS requirements for issuance.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

Description:

The project involves installation of 15 MW wind mills by M/s. Mineral Enterprises Limited in the Jogimatti Wind Zone at Chitradurga District in Karnataka, India. The small scale project activity includes installation of 5 Numbers of 600 kW and 15 numbers of 800 kW with totaling of 15 MW. All the windmills are made my Enercon India Limited. The wind mills produce electricity and supply to southern grid under PPA. The wind mills are connected in four high tension service connection namely MMCL05, ELP39, VVS28,

ELP20. The wind mills are synchronized to southern grid through the four connection in the following schedule

Service No/RR No	Wind mills connected to the service line	Date of synchronization/P10/ (commissioning date)
MMCL05	3 x 800 kW	17/09/2005
ELP39	7 x 800 kW	31/03/2006
VVS28	5 x 600 kW	30/09/2004
ELP20	5 x 800 kW	31/03/2006

This has been confirmed by verifying commissioning certificates/P10/ of wind mills. However in the monitoring report the commissioning date of MMCL05 is mentioned as 28/10/2005. Hence CAR 4.1-2 is raised.

The project generates energy from wind resources and fed to southern grid thereby displacing, electricity generated using existing fossil fuel based power plants or future capacity additions in the southern grid.

As per validated VCS-PD only Davangere electricity division existed for preparing the B-forms at different sites for Chitradurga corridor. Later to the validation the new divisions were formed. Hence Davangere changed Chitradurga. Similarly the divisions of ELP 39 and ELP 20 are changed from Davangere to Hiriyur. The same is confirmed from the joint meter reading (B-Form)/P3/ and 1st verification report/B10/

It was verified in the course of this verification that the actual project activity was implemented in accordance with the Validated PD /B9/.

All raised CARs and CRs were successfully closed during the Validation of the project design. One FAR has been raised during the validation stage which needs to be checked in every verification. The Verification has been carried out based on the final Validated PD/B9/, Monitoring report /P1/, Emission reduction calculation sheet /P2/, Calibration test certificates/P5/ and joint meter reading/P3/ reports. There are no remaining issues prevailing in these documents except the FAR B1 in the validation report.

Findings:

CAR/CL/FAR:	**CL 4.1-1**
Observation	FAR B1 raised in the validation report describes "*It is noted that IRR crosses benchmark when PLF increases to 10%. In future during every verification, it has to be ensured that the PLF does not increase to 10%"* Please justify the same for this monitoring period
Project owner response	The PLF achieved during the monitoring period 20010-12 are 18.93% for 2010, 23.87% for 2011 and 30.46% for 2012. The PLF for years 2010 and 2011 are within the PLF of 26.50% considered for Investment Analysis in the VCS PD. However, the PLF for the year 2012 is over 15% higher than the

<table>
<tr><td></td><td>PLF of 26.50% considered for Investment Analysis. In this regard, it should also be noted that average PLF for the monitoring period is 24.42% which is less than the PLF of 26.50% considered for Investment Analysis. Hence, it can be concluded that the 15% increase in the PLF achieved for 2012 can be considered as an aberration dictated by the vagaries of nature which is not in control of the PP.</td></tr>
<tr><td>Verification team conclusion</td><td>The PLF achieved during the monitoring period and the PLF considered in the validated VCS-PD are as follows:

<table><tr><td>Plant Load Factor (Year 2010)</td><td>18.93%</td></tr><tr><td>Plant Load Factor (Year 2011)</td><td>23.87%</td></tr><tr><td>Plant Load Factor (Year 2012)</td><td>30.46%</td></tr><tr><td>Average PLF for the three monitoring years</td><td>24.42%</td></tr><tr><td>Project Plant Load Factor in the VCS PD for VCS Registration</td><td>26.50%</td></tr></table>
As per the above data, only during the year 2012 the PLF is increased upto 15% than compared to the PLF considered in the VCS-PD. This is due to the higher wind flow available during the year 2012 which is not in the control of PP. However during the year 2010 & 2011 the PLF is much lesser than the PLF considered in the VCS-PD. Moreover the average PLF achieved during the monitoring period (25.10%) is 7.8% lesser than the PLF considered in the VCS-PD (26.50%). Hence this will not affect the additionality of the project.

CL 4.1-1 is closed.</td></tr>
</table>

CAR/CL/FAR:	**CAR 4.1-2**
Observation	The commissioning date of MMCL-05 (ie., units 6-8 comprising 3 Nos) is mentioned as 28/10/2005. But as per the commissioning certificate as well as VCS-PD, the commissioning date of the MMCL-05 is 17/09/2005. Please correct
Project owner response	The comments have been addressed and needful corrections have been made.
Verification team conclusion	The commissioning date of MMCL-05 has been now corrected to 17/09/2005 which is consistent with the date mentioned in the commissioning certificate. CAR 4.1-2 is closed

CAR/CL/FAR:	CAR 4.1-3
Observation	As per the validated VCS-PD, the methodology used in the project is UNFCCC methodology AMS I.D version 13. But monitoring report refers version 14 of the AMS I.D. Please correct
Project owner response	The comments have been addressed and needful corrections have been made
Verification team conclusion	The monitoring methodology AMS I.D version has been now changed to version 13 which is the version applied in the validated VCS-PD. CAR-4.1-3 is closed.

Final Conclusion:

On-site visit was carried out during Verification. The location and implementation details of the WTGs covered in this project activity were verified during on-site visit and confirmed that the project has been implemented as described in the validated VCS PD/B9/

The FAR raised in the validation report regarding the PLF has been closed for this verification period. Also there are no remaining issues/ discrepancies in previous validation of the project. The VCS PD/B9/ and validation report/B9/ are checked and found to be OK.

CL 4.1-1, CAR 4.1-2 & CAR 4.1-3 were raised in this regard and closed successfully.

4.2 Accuracy of GHG Emission Reduction or Removal Calculations

The proposed project uses CDM approved methodology AMS ID, Version 13: Grid Connected Renewable electricity Generation, which is approved under VCS standard version 03.

The project satisfies all criteria for AMS ID. The application of monitoring methodology is assessed as correct.

The monitoring plan/B9/ provides detailed information related to the collection and archiving of all relevant data needed to:

- Estimate or measure emissions occurring from GHG sources, sinks and reservoirs
- Determine the baseline emissions
- Estimate changes in emissions from the site

As per the Validated PD, Net electricity supplied by WTGs in the project activity is the only parameter which is to be monitored during the whole crediting period.

The monthly energy readings are noted down my BESCOM persons along with the O&M representatives. The net electricity supplied to grid is calculated by considering export, import and the transmission loss and the same has been written in B-Forms[/JMR/] issued monthly to each individual service connection by the BESCOM. The meter details are given below

RR NOs	Meter	Meter No.	accuracy
VVS28	Main	04219526	0.2%
	Check	04219572	0.2%
MMCL05	Main	05271166	0.2%
	Check	05271164	0.2%
ELP 39	Main	05389383	0.2%
	Check	05389380	0.2%
ELP -20	Main	05389963	0.2%
	Check	05389944	0.2%

Details	**MMCL05**	**ELP39**	**VVS28**	**ELP20**
Date of commissioning	28/10/2005	31/03/2006	20/09/2004	31/03/2006
Calibration dates	07/09/2010	15/12/2010 10/08/2010 29/02/2010	09/12/2010 12/07/2010 26/04/2010	28/09/2010
	06/09/2011	15/11/2011 08/07/2011 21/04/2011	19/12/2011 24/09/2011 23/06/2011 1508/03/2011	21/11/2011 29/07/2011 18/04/2011 11/01/2011
	03/09/2012	15/05/2012 23/02/2012	08/06/2012 08/03/2012	15/05/2012 18/02/2012

The calibration certificates of the meters were verified and found that the calibration was done within 1 year frequency that is mentioned in the validated PDD.

As most essential part of the verification exercise it is indispensable to carry out an inspection on site in order to verify that the project is implemented in accordance with the applicable criteria. Furthermore the

on-site assessment is necessary to check the monitoring data with respect to accuracy to ensure the calculation of emission reductions. The main tasks covered during the site visit include, but are not limited to:

- The on-site assessment included an investigation of whether all relevant equipment is installed and works as anticipated.
- The operating staff was interviewed and observed in order to check the risks of inappropriate operation and data collection procedures.
- Information processes for generating, aggregating and reporting the selected monitored parameters were reviewed.
- The duly calibration of all metering equipment was checked.
- The monitoring processes, routines and documentations were audited to check their proper application.
- The monitoring data were checked completely.
- The data aggregation trails were checked via spot sample down to the level of the meter recordings.

The on-site audit was carried out on 23/01/2013. Two member of the verification team attended the site visit.

Before and during the on-site visit the verification team performed interviews with the project participants to confirm selected information and to resolve issues identified in the document review. It is assessed that the data and parameter monitored by the above said approach is accurate, conservative and transparent. It is found to be valid and acceptable.

The verification team has verified and found out that GHG emission reduction achieved by the project activity is calculated as the difference between the baseline emission and the project emission as well as the leakage emission. There are no GHG emissions arising from the project being a green power project. Hence, the project emissions are zero. As the project activity does not involve power plant construction, fuel handling (extraction, processing, and transport), and land inundation, the leakage due to the project activity is not applicable as per AMS ID version 13.

Following the AMS I.D methodology, the combined margin (CM) methodology calculated ex-ante was chosen to calculate the baseline emission factor.

Baseline emission is equal to Net Electricity export by the project to the grid by the project activity (EG_y) multiplied by the grid emission factor ($EF_{grid,y}$).

The baseline emission factor is equal to the CM, which is applying the default weights are as follows: W_{OM} = 0.9981 and W_{BM} = 0.7133 for operating margin emission factor ($EF_{OM,y}$) and the build margin emission factor ($EF_{BM,y}$).

The calculation method of the OM and BM is derived from the guide of OM and BM calculation issued by CO_2 Baseline Database for the Indian Power Sector, User Guide (Version 4, Date: October, 2008) issued by CEA.

The project proponent has calculated the Simple Operating Margin (OM) based on the latest three year statistics data (year of 2005-06, 2006-07, 2007-08) as per Central Electricity Authority guidelines version 4.0 October 2008 and the Operating Margin Emission Factor is 0.9981 tCO_2/MWh, which is weighted average of the three year data. The value for Build Margin (BM) for 2007-2008 is directly used, i.e.,

0.7133 tCO_2/ MWh and a weightage factor of 75% & 25% is used for OM and BM to arrive at the Combined Margin value of 0.9269 tCO_2/MWh.

Both the values of Simple Operating Margin and Build Margin are selected under ex-ante approach. The grid boundary w.r.t the connected state grid is in Southern Regional Grid of India. The calculation of EF_y is current and publicly available and published by the Central Electricity Authority on its web-site/CEA/ and fixed ex-ante during the entire crediting period.

The main parameters to measure are the electricity exported to the grid, electricity imported from the grid and net electricity generated. The evacuation facility of the project activity to deliver the power to grid is maintained by the BESCOM. In the project activity total electricity generated is being measured by energy meter, which is jointly monitored by the project participant and BESCOM.

To calculate net electricity supplied by the project activity, the PP has mentioned some procedure to calculate net electricity supplied to Southern grid. The electricity supplied to grid and electricity drawn from the grid are measured in the main meter reading. The net electricity exported to grid is calculated as follows

Net electricity exported to grid = electricity supplied to grid – 115% of electricity drawn from grid – transmission loss

The net electricity is noted from joint meter reading/P3/ on monthly basis which is duly signed by the PP and BESCOM in the B-FORM/P3/,

Nevertheless the following issues were identified in this regard.

Findings:

CAR/CL/FAR:	**CL 4.2-1**
Observation	As per the MR the net electricity is calculated based on export, import and transmission loss. i.e., Net electricity exported to grid = electricity supplied to grid – 115% of electricity drawn from grid – transmission loss However the as per ER calculation sheet the transmission loss is added back for with the net electricity. Ie, the net electricity is based on considered as follows: Net electricity exported to grid = electricity supplied to grid – 115% of electricity drawn from grid Please clarify.
Project owner response	The corrections have been made using the above mentioned formulae “Net electricity exported to grid = electricity supplied to grid – 115% of electricity drawn from grid – transmission loss”
Verification team	In emission reduction calculation sheet, the net electricity export calculation

conclusion	is corrected which is now inline with the JMR (B-Form) calculation. Based on this the emission reduction achieved is corrected now. CL 4.2 -1 is closed

CAR/CL/FAR:	**CAR 4.2-2**
Observation	The calibration details of MMCL05 energy meter is not included in the MR. Please include the same.
Project owner response	The calibration details of MMCL05 have been included in the revised MR.
Verification team conclusion	The calibration details of MMCL-05 is now included. The details of the same is now verified through the MR CAR 4.2-2 is closed

CAR/CL/FAR:	**CAR 4.2-3**
Observation	Emission reduction needs be rounded down as conservative option.
Project owner response	The Comments have been responded with respect to Emission reduction values.
Verification team conclusion	The emission reduction is now rounded down which is conservative. CAR 4.2-3 is closed

Final Conclusion:

During on-site visit, the details of monitoring equipment's such as make, accuracy class, type and serial numbers were recorded. The details w.r.t energy meters provided in the monitoring report/P1.2/ were verified with their respective calibration certificates/P5/ and validated VCS PD/B9/ and are found to be OK. The verification team has checked all the JMR (B-Foms) covering the monitoring period and found that the monthly net electricity generation value considered for the emission reduction is correct. The emission reduction calculation sheet is verified and found that the emission reduction calculation is correct and inline with AMS I.D version 13.

All other relevant evidences were fully checked by the verification team during the on-site visit. All evidences are clearly identifiable and assessed to be correct. For the considered verification period, all indicators stated in the applicable monitoring methodology AMS I.D (Version 13) were correctly monitored and reported. Hence all the value applied for emission reduction calculation is found to be accurate and correct.

CL 4.2-1, CAR 4.2-2 & CAR 4.2-3 are raised in this regard and closed successfully.

4.3 Quality of Evidence to Determine GHG Emission Reductions or Removals

Description

The only key monitoring parameter with influence on the calculation of the emission reductions is the Net electricity supplied to the Grid and the grid emission factor. The power is measured with high accuracy and duly calibrated class power meters. The meters are of 0.2% accuracy.

The grid emission factor is a validated value and has been fixed ex-ante for the entire crediting period is taken from the registered PD/B9/.

All necessary monitoring instruments are installed. The measuring devices use a proven and state of the art technology for measurement. The details of the meters are given in the monitoring report/P1/. The calibration records are reviewed. Calibration has been carried out with frequency mentioned in the monitoring plan.

The net electricity supplied to grid by the WTGs belonging to the project activity as reported in the monitoring report/P1/ and the emission reduction calculation sheet/P2/ were verified with the B-Forms/P3/ given by BESCOM. These certificates are issued by BESCOM a government body. Moreover, these B-Forms are used for commercial billing by state electricity board. Hence these are considered as highly authentic and reliable source of information. All evidences are clearly identifiable and assessed to be correct.

The other data monitored for plausibility check were also checked. This data consists of power generation by individual WTG/P8/, tower shut down, grid availability and these are recorded daily and maintained by O & M team. The data were checked by the verification team during site visit. It was found that these data was being maintained as defined in the monitoring plan in the validated PD/B9/

All the monitored data have been provisioned to be kept for at least 2 years after the end the issuance of VERs as per the requirement.

Findings:

No CARs/CLs/FARs is raised in this regard

Final Conclusion:

The project activity has got dedicated metering system and thus the value reflected in the ER sheet is purely for the project activity. Calibration procedures and test reports of the all online energy meters covering the reported monitoring period were verified for their frequency and traceability to industry standards. Proper data management including of data acquisition, aggregation and data management system is being followed in project activity. All records needed for monitoring are archived in line with the requirements of the validated monitoring plan/B9/. 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 operation, no major break down has been found during the monitoring period. The data pertaining to the monitoring are maintained in identified records for the entire monitoring period. All the data is in compliance with the figures stated in the monitoring report. Hence the quality of evidence provided is found to be credible and in line with monitoring plan of the validated PD/B9/

4.4 Management and Operational System

Description:

The roles and responsibilities of the responsible person for monitoring of emission reductions for the verification of measurement, data collection as well as the preparation of monitoring report have been implemented as it is defined in the validated PD/B9/. This was verified during the on site assessment conducted by the verification team on 23/01/2013

All internal data are subjected to QA/QC measures. All monitored data are archived partly in physical and partly in Electronic format. The Enercon India Limited is an ISO 9001:2000 certified and have proper procedures for data handling.

The allocation of responsibilities is documented in a written form and is followed as described in the PD and MR. This has been verified. Routines for the archiving of data are defined and documented. Calculations are laid down in the monitoring report are in line with VCS PD/B9/.

The monitoring personnel at site are well trained and follow reproducible routines as was evident during the site visit. Members of monitoring team were interviewed. Procedure for training and maintenance of critical equipments were discussed during site visit. Day to day operation is supervised by the technically qualified site engineers and has adequate knowledge. They have the responsibility to supervise various technical staff for around the clock who engage in operation and maintenance of project activity. Training records for the monitoring personnel were reviewed during site visit. The training would be provided to the concern personnel as required. 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.

The main meter readings are noted in presence of officials from both BESCOM and the PP The project activity has got dedicated metering system and thus the value reflected in the ER sheet is purely for the project activity.

The main meter and check meters of the windmills were calibrated within the frequency mentioned in the VCS-PD during the reported monitoring period. The monitoring report therefore satisfies the calibration procedure followed and the calibration frequency for the energy meters

Findings:

No CARs/CLs/FARs is raised in this regard

Final Conclusion:

The monitoring procedures and responsibilities are documented in a written form and is followed as described in the Validated PD[/B9/]. Routines for the archiving of data are defined and documented. Calculations are laid down in the monitoring report is in line with validated PD[/B9/].The monitoring personnel are well trained and follow reproducible routines. Thus, they have the necessary competence to carry out the relevant tasks with sufficient accuracy.

5 VERIFICATION CONCLUSION

TÜV Rheinland (China) Ltd., the DOE, has performed the verification of the validated VCS project activity "15 MW Grid Connected Renewable Energy Wind Turbine Project In Karnataka " in India. The project activity is designed to generate emission reductions by replacing grid electricity with renewable biomass electricity

The project participants are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project. It is DOE's responsibility to express an independent verification statement on the reported GHG emission reductions from the project. The DOE does not express any opinion on the selected baseline scenario or on the validated VCS PD. The verification is carried out in-line with the VCS validation verification manual requirements.

The verification was performed to identify the compliance of the project activity with implementation and monitoring requirements, and to verify the actual amount of achieved emission reductions, through obtaining evidence and information on-site that included i) checking whether the provisions of the monitoring methodology and the monitoring plan were consistently and appropriately applied, ii) the collection of evidence supporting the reported data and iii) emission reductions that are claimed is free from material errors, omissions or misstatements.

The verification is based on:

— VCS PD version 04 dated 10/11/2009, and its monitoring plan;

— Approved CDM monitoring methodology AMS I.D "Grid Connected Renewable Electricity Generation", version 13.0;

— Validation report, dated 10/11/2009;

— Monitoring reports versions 01 and 02, dated 09/01/2013 and 25/02/2013 respectively.

This statement covers verification period of 1096 days between 01/01/2010 and 31/12/2012.

The DOE has raised 2 clarification and 4 corrective action requests, all of which have been successfully resolved by PPs.

The DOE considers necessary to give reasonable assurance that reported GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology and the monitoring plan contained in the registered PDD are fairly stated.

The DOE, hereby certifies that the project activity, achieved emission reductions by sources of GHG is as mentioned below and all monitoring requirements have been fulfilled.

GHG Emission Reductions or Removals	2010	2011	2012	Total in the monitoring period
Baseline Emissions (tCO_2e)	23059	29077	37099	89235
Project Emissions (tCO_2e)	0	0	0	0
Leakage (tCO_2e)	0	0	0	0
Net GHG emission reductions or removals (tCO_2e)	**23059**	**29077**	**37099**	**89235**

The DOE states that the Claimed emission reductions are free from material errors, omissions and misstatements with a reasonable level of assurance.

13/03/2013	12/03/2013	11/03/2013
Date	Date	Date
Mr. Praveen Nagaraje Urs DOE Manager TÜV Rheinland (China) Ltd.	Ms. Indumathi C Technical Reviewer TÜV Rheinland (India) Pvt. Ltd.	Mr. R. Narendra Kumar Team Leader TUV Rheinland (India) Pvt. Ltd