VOLUNTARY CARBON STANDARD 2007.1

VERIFICATION REPORT

15 MW GRID CONNECTED RENEWABLE ENERGY WIND TURBINE PROJECT IN KARNATAKA

Monitoring Period: 2006-04-01 to 2009-12-31
(incl. both days)

Report No: 53601710 - 10/291

Date: 2011-03-28

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Name of Verification company:	Date of the issue:
TÜV NORD CERT GmbH	2011-03-28
Report Title:	**Approved by:**
Verification report of "15 MW Grid Connected Renewable Energy Wind Turbine Project in Karnataka"	Rainer Winter
Client:	**Project Title:**
M/s. Mineral Enterprises Ltd.	15 MW Grid Connected Renewable Energy Wind Turbine Project in Karnataka

Summary:

Deviation:
In the validated VCS-PD the HTSC/RR number of 5 x 600 kW wind turbine is wrongly mentioned as VVS26 instead of VVS28. The same has been corrected in the MR & verification report. The HTSC/RR number is confirmed during site visit and by checking the commissioning certificates of the wind mills.

M/s. Mineral Enterprises Ltd has commissioned the TÜV NORD JI / CDM Certification Program to carry out the verification of the Project "15 MW Grid Connected Renewable Energy Wind Turbine Project in Karnataka" in Chitradurga District, Karnataka with regard to the requirements of VCS 2007.1 Standard.

The project activity involves generation of renewable electricity from 15 MW windmills which is being supplied to southern grid of India.

Reporting period: From 2006-04-01 to 2009-12-31

In the course of the verification 5 Corrective Action Requests (CARs), 3 Clarification Requests (CLs) were successfully closed. And there is no Forward Action Request (FAR) raised in the verification.
The verification is based on the draft monitoring report, revised monitoring report, the monitoring plan as set out in the validated PD, the validation report, emission reduction calculation spreadsheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.
As the result of the 1st periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Emission reductions 108886 t CO_2 equivalents

Work carried out by:	Number of pages:
Mr. Ma Paa Puratchikkanal Mr. R Murali Ms. C Indumathi	37

Mr. R Narendra Kumar	

Abbreviations

BAU	Business as usual
BESCOM	Bangalore Electricity Supply Company Limited
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CO_2	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
CP	Certification Program
CL	Clarification Request
DNA	Designated National Authority
EB	CDM Executive Board
EIA	Environmental Impact Assessment
EIL	Enercon (India) Ltd
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
JMR	Joint meter reading
KPTCL	Karnataka Power Transmission Corporation Ltd
MEL	Mineral Enterprises Ltd
MP	Monitoring Plan
MR	Monitoring Report
PPA	Power purchase agreement
QC/QA	Quality control/Quality assurance
TVM	Tri vector meter
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Voluntary Carbon Standard
VCS - PD	VCS - Project Description
VCU	Voluntary Carbon Unit
VVM	Validation and Verification Manual
WEG	Wind Energy Generators

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1 INTRODUCTION

M/s. Mineral Enterprises Ltd has commissioned the TÜV NORD JI/CDM Certification Program to carry out the verification of the project:

"15 MW Grid Connected Renewable Energy Wind Turbine Project in Karnataka"

with regard to the relevant requirements of the Voluntary Carbon Standard 2007.1[/VCS/]. The verifiers have reviewed the implementation of the monitoring plan (MP) in the registered VCS project for the monitoring period 2006-04-01 to 2009-12-31.

The applied monitoring methodology is AMS I.D "Grid connected renewable electricity generation, version 13

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[/ER/], 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 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.

1.3 VCS Project Description

1.3.1 Project Characteristics

Essential data of the project is presented in the following Table 1-1.

Table 1-1: Project Characteristics

Item	Data
Project title	15 MW Grid Connected Renewable Energy Wind Turbine Project in Karnataka
Project owner	Mineral Enterprises Ltd
Any specific project categories	☐ Mega project (> 10^6 t CO_{2eq} / a) ☐ Micro project (< 5000 t CO_{2eq} / a) ☐ AFOLU project ☒ Grouped project ☐ No specific project category
VCS PD dated	Draft: 2009-04-30 Final: 2009-11-10
Applied Methodology	AMS ID Version 13
Project starting date	2004-09-30
Crediting period	☐ Renewable Crediting Period (7 y) ☒ Fixed Crediting Period (10 y)
Start of crediting period	2006-04-01

1.3.2 Project Location

The details of the project location are given in table 1-2:

Table 1-2: Project Location

No.	Project Location
Host Country	India
Region:	Karnataka
Project location address:	Mentioned below in table for each wind mill
Latitude:	Mentioned below in table for each wind mill
Longitude:	Mentioned below in table for each wind mill

HTSC/RRNo	Village	Taluk	District	Longitude	latitude
VVS28	Elladekere	vanivilassagar	Chitradurga	N13°51'21"	E76°29'33"
VVS28	Elladekere	vanivilassagar	Chitradurga	N13°51'21"	E76°29'33"
VVS28	Elladekere	vanivilassagar	Chitradurga	N13°51'21"	E76°29'33"

VVS28	Elladekere	vanivilassagar	Chitradurga	N13°51'21"	E76°29'33"
VVS28	Elladekere	vanivilassagar	Chitradurga	N13°51'21"	E76°29'33"
MMCL05	Mathighatta &berebahalli	Holalkere	Chitradurga	N14°05' 22"	E76°0'25"
MMCL05	Mathighatta &berebahalli	Holalkere	Chitradurga	N14°05' 22"	E76°0'25"
MMCL05	Mathighatta &berebahalli	Holalkere	Chitradurga	N14°05' 22"	E76°0'25"
ELP39	kitthadallhill	Hiriyur	Chitradurga	N13°56'46"	E76°25'10"
ELP39	kitthadallhill	Hiriyur	Chitradurga	N13°56'46"	E76°25'10"
ELP39	kitthadallhill	Hiriyur	Chitradurga	N13°56'46"	E76°25'10"
ELP39	kitthadallhill	Hiriyur	Chitradurga	N13°56'46"	E76°25'10"
ELP39	kitthadallhill	Hiriyur	Chitradurga	N13°56'46"	E76°25'10"
ELP39	kitthadallhill	Hiriyur	Chitradurga	N13°56'46"	E76°25'10"
ELP39	kitthadallhill	Hiriyur	Chitradurga	N13°56'46"	E76°25'10"
ELP20	kitthadallhill	Hiriyur	Chitradurga	N13°59'42"	E76°24'8"
ELP20	kitthadallhill	Hiriyur	Chitradurga	N13°59'42"	E76°24'8"
ELP20	kitthadallhill	Hiriyur	Chitradurga	N13°59'42"	E76°24'8"
ELP20	kitthadallhill	Hiriyur	Chitradurga	N13°59'42"	E76°24'8"
ELP20	kitthadallhill	Hiriyur	Chitradurga	N13°59'42"	E76°24'8"

1.3.3 Technical Project Description

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 in table 1-3:

Table 1-3a: Technical data of the project

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

Table 1-3b: Parameters confirmed during verification

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

RR NOs	Meter	Meter ID 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%

1.3.4 Appointment of team members and technical reviewer

On the basis of a competence analysis and individual availabilities a verification team was appointed. Furthermore also the personnel for the technical review and the final approval was determined.

The list of involved personnel, the tasks assigned and the qualification status are summarized in the table 1-4 below.

Table 1-4: Involved Personnel

	Name	Company	Function [1)]	Qualification Status [2)]	Scheme competence	Technical competence [4)]	Host country Competence	Team Leading competence
☒ Mr. ☐ Ms.	Ma Paa Puratchikkanal	TUV India Pvt, Ltd, Bangalore	TL/TE	SA	☒	T	☒	☒
☒ Mr. ☐ Ms.	R Murali	TUV India Pvt. Ltd, Bangalore	TM	E	☒	-	☒	☐
☐ Mr. ☒ Ms.	C Indumathi	TUV India Pvt. Ltd, Bangalore	TM	E	☒	T	☒	☐
☒ Mr. ☐ Ms	R Narendra Kumar	TUV India Pvt. Ltd., Bangalore	OT[3)]	T	☐	-	☒	☐
☐ Mr. ☒ Ms.	Katja Beyer	TN CERT GmbH	TR	A	☒	-	☐	☒
☒ Mr. ☐ Ms.	Klein Ingo	TN CERT GmbH	TR	E	☒	T	☐	☐
☒ Mr. ☐ Ms.	Rainer Winter	TN CERT GmbH	FA	SA	☒	T	☐	☒

[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; E: Expert; SA: Senior Assessor; T: Trainee; TE: Technical Expert

[3)] No team member

[4] As per S01-MU03 or S01-VA070 A2 (such as A, B, C.....)

1.4 Level of Assurance

The verification has been planned and organized to achieve a

☒ reasonable level of assurance

☐ limited level of assurance.

2 METHODOLOGY

The verification of the project consisted of the following steps:

- Contract review
- Appointment of team members and technical reviewers
- Publication of the monitoring report
- Desk review of the Monitoring Report/MR/ submitted by the client and additional supporting documents.
- Verification planning,
- On-Site assessment,
- Background investigation and follow-up interviews with personnel of the project developer and its contractors,
- Draft verification reporting
- Resolution of corrective actions (if any)
- Final verification reporting
- Technical review
- Final approval of the verification.

The sequence of the verification is given in the table 2.1 below:

Table 2.1: Verification sequence

Topic	Time
Assignment of verification	2010-06-28
On-site visit	2010-07-06
Draft reporting finalised	2010-07-26
Technical review on draft reporting finalised	2010-07-26
Final reporting finalised	2010-09-24
Technical review on final reporting finalised	2011-03-28
Final corrections	2011-03-28

The main verification steps are described below.

2.1 Review of Project Documentation

The VCS PD /VCS-PD/ and supporting background documents related to the project design and baseline were reviewed.

Furthermore, the verification team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data.

The references used in the course of this verification are summarized in section 5.

2.2 On-Site Assessment

2.2.1 Review of Performance Records

The verification team has 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 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/VCS-PD/ & /MR/ and were assessed and found to be OK.

The on-site audit was carried out on 2010-07-06. Two members of the Verification team attended the site visit.

2.2.2 Follow-up Interviews

The verification team has carried out interviews in order to assess the information included in the project documentation and to gain additional information regarding the compliance of the project with the relevant criteria applicable for the VCS.

During verification the verification team has performed interviews to confirm selected information and to resolve issues identified in the document review. The main topics of the interviews are summarized in Table 2-2.

Table 2-2: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
Project proponent representatives Mr. Sanjay, MEL /IM01/	- General aspects of the project - Technical equipment and operation - Changes since validation - Monitoring and measurement equipment - Remaining issues from validation / previous verifications - Calibration procedures - Quality management system - Involved personnel and responsibilities
Project consultant Mr. Prabhakar, Consultant /IM02/	- 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

A comprehensive list of all interviewed persons is part of section 5 ‘References’.

2.2.3 Collection of Measurements

The parameter monitored in this project activity is net electricity exported to grid by the windmills.

The energy generated in the project activity was exported to the grid during the reported monitoring period.

Electricity produced is being measured by main meter and check meter installed in the wind mills. The Net electricity supplied to the grid is recorded monthly by taking a Joint Meter Reading from the main meter in the presence of officials from BESCOM and MEL representatives. The Joint meter reading contains the value of energy imported and exported to the grid during the recording period. The JMR is issued in a format called B-Form/JMR/ which includes electricity exported to grid, imported from grid, transmission loss and net electricity supplied to grid. This B-Form is duly signed by BESCOM representatives

The metered units are cross verified by the invoice copies raised by Mineral Enterprises limited to the BESCOM.

During the on-site visit, the information about all the energy meters which was mentioned above was verified. In addition the B-Forms[/JMR/] reports which were duly signed by the representatives KPTCL/HESCOM and the PP and the Invoice copies[/inv/] were also verified. All the procedure followed in the site are found to be in line with the monitoring plan [/VCS-PD/] & the PPA[/PPA/] signed for the project and deemed to be OK. No significant, lack of evidence and missing data were detected.

2.2.4 Observation of established practices and testing of the accuracy of monitoring equipment

All required instruments and operating procedures implemented for the project are in an appropriate manner and in line with the validated PD[/VCS-PD/]. Responsibilities related to monitoring are executed as defined in the monitoring plan[/VCS-PD/ & /MR/]. Calibration procedures of energy meters covering the reported monitoring period was verified for their frequency and traceability to industry standards. As per validated VCS PD[/VCS-PD/] meters should be calibrated[/CAL/] once in a year years.

But the main meters and check meters of both the wind mill were not calibrated in the reported monitoring period. And through later calibration it is found that the meters are in the acceptable error limit (<0.2%). As per the EB 52 Annex 60: “Guidelines for Assessing Compliance with the Calibration Frequency Requirements” the energy exported to grid and imported from grid are adjusted with the maximum (0.2%) error limit for months were the calibration validity is not there for the purpose of ER calculation.

The monitoring system is in compliance with the applied monitoring methodology (AMS I.D version 13) and the monitoring procedure mentioned in the registered PD[/VCS-PD/]. Proper data management including of data acquisition, aggregation and data management system is being followed in project activity.

Responsibilities related to monitoring are clearly defined in the monitoring plan and were assessed and found to be OK.

2.3 Determination of the reductions in GHG emissions

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 the methodology.

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 operating margin (OM) and Build margin (BM) 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.

Baseline emission Factor (EF_{BL}) Or Combined margin is calculated as weighted average of simple Operating Margin and build Margin emission Factors. As per the methodological tool to calculate emission factor for an electricity system the weights given for Operating margin and Build margin are

WOM = 0.75

WBM = 0.25

Therefore, EF_{BL} = (0.75 X EFOM) + (0.25 X EFBM) = 0.9269 tCO_2equivalent / MWh

The total net electricity supplied by the WTGs during the monitoring period after adjusted for calibration non validity months is 117,475 MWh. The baseline emission factor has been fixed ex-ante as 0.9269 tCO_2/MWh based on the CO_2 Baseline Database for the Indian Power Sector, User Guide (Version 4, Date: October, 2008) issued by CEA for NEWNE Grid[/CEA/]. Based on the net electricity supplied and the emission factor the net emission reductions are 108,886 tCO_{2e}.

The verification team has checked the input values as well as the computation in the emission reduction spreadsheet[/ER/]. The estimation of the emission reduction was realized in a transparent and conservative manner. Thus the emission reduction achieved in the first verification period (from 2006-04-01 to 2009-12-31 (incl. both days)) is 108,886 tCO_2e.

2.4 Review of additional data from other sources if appropriate

During the site visit the meter SCADA meter readings of individual windmills are verified. These readings are compared with the B-Form import readings and found to be OK as B-Forms readings are conservative.

2.5 Review of monitoring results and verification of the correct application of monitoring methodologies

Proper data management including 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 validated monitoring plan /VCS-PD/. All internal data are subjected to QA/QC measures. The Enercon India Limited is being an ISO 9001:2000 certified/En/ and have proper procedures for data handling.

The monitoring personnel at site are well trained and follow reproducible routines. 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. It was 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 monitoring procedure & reporting/MR/ & /ER/ is in line with the requirements of the validated monitoring plan/VCS-PD/ as well as with the applied methodology AMS ID, version 13.

The verification team has carried out interviews in order to assess the information included in the project documentation and to gain additional information regarding the compliance of the project with the relevant criteria applicable for the VCS.

2.6 Resolution of any material discrepancy

Material discrepancies identified in the course of the verification are addressed either as CARs, CLs or FARs.

A **Corrective Action Request (CAR)** is 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 verification of the project with certain characteristics have not been met or
- there is a risk that the project would not be registered 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.

A detailed list of the CARs CLs and FAR raised and discussed in the course of this verification is included in the next section 3 of this report.

3 VERIFICATION FINDINGS

In this section the assessments and findings from the desk review of the VCS PD, site visit, interviews and supporting documents as well as the final assessments are summarised. Table 3-1 includes an overview of all raised CARs, CLs and FARs.

Table 3-1: Overview of CARs, CLs and FARs issued

No.	Topic / Chapter	CAR	CL	FAR
3.1	Remaining issues, including any material discrepancy	-	-	-
3.2	Project implementation	2	-	-
3.3	Completeness of monitoring	3	2	-
3.4	Accuracy of emission reduction calculations	-	1	-
3.5	Quality of evidence to determine emission reductions	-	-	-
3.6	Management and operational system	-	-	-
-	**SUM**	**5**	**3**	**0**

3.1 Remaining issues, including any material discrepancy, from previous validation

Description

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/VCS-PD/, Monitoring report /MR/, Emission reduction calculation sheet /ER/, Calibration test certificates/CAL/ and joint meter reading/JMR/ reports. There are no remaining issues prevailing in these documents except the FAR B1 in the validation report.

Related Findings

☐ No CARs, CLs or FARs have been identified in this context

☒ The following finding(s) have been addressed:

Finding:	3.1-1		
Classification	☐ CAR	☐ CL	☒ FAR

Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	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%.
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The PLF calculation (without error application) is submitted in the excel sheet. The PLF for this monitoring period is not increased to 10%. Instead it is reduced to 10%.
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The PLF achieved during the monitoring period is 10% lesser than the PLF used for additionality calculation. Hence the additionality is still valid. FAR raised during validation is closed for this verification.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☐ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Final Assessment

The PLF of the project is not increased more than 10%. Instead it is decreased to 10% during the monitoring period. Hence the additionality is still valid. Other than the above FAR there were no remaining issues/ discrepancies in previous validation of the project. The PD and validation report are found to be OK.

☒ FAR 3.1-1 is closed for this verification

3.2 Project implementation

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	Date of synchronion

	the service line	(comissioning date)
MMCL05	3 x 800 kW	28th Oct.2005
ELP39	7 x 800 kW	31st Mar 2006
VVS28	5 x 600 kW	30th Sep 2004
ELP20	5 x 800 kW	31st Mar 2006

This has been confirmed by verifying commissioning certificates of wind mills.

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. During the monitoring period from 2006-04-01 to 2009-12-31 (incl. both days) the project activity has exported a total net electricity of 117,475 MWh and thus the total baseline emissions come to 108,886 $tCO_{2e.}$

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

Related Findings

☐ No CARs, CLs or FARs have been identified in this context

☒ The following finding(s) have been addressed:

Finding:	**3.2-1**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The B-Forms of HTSC/RR number VVS 26 is not submitted for verification. Instead B-Forms of VVS 28 are submitted.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The actual HTSC/RR number is VVS 28. This can be verified through the commissioning certificates submitted during validation. VVS 26 is a typographical error in VCS PD and MR. And the same has been corrected in the MR and also explained as deviation.		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The HTSC number of the 5 x 600 kW wind mill is VVS 28. This has been confirmed during site visit and through verification of commissioning certificates of the wind mills. The HTSC number is wrongly mentioned VCS PD and MR as VVS 26. This has been corrected in the MR and explained as a deviation from VCS-PD. Hence CAR is closed.		

Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding:	**3.2-2**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	B-Forms of the starting months of the monitoring period mention the MMCL 05 is connected to 'Davangere' division. But later months specify it is Chitradurga. Similarly the divisions of ELP 39 and ELP 20 are changed from Davangere to Hiriyur. Please provide reason.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	Earlier only Davangere electricity division existed for preparing the B-forms at different sites for Chitradurga corridor. Subsequently new divisions were formed. Hence Davangere changed Chitradurga. Similarly the divisions of ELP 39 and ELP 20 are changed from Davangere to Hiriyur.		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The argument is accepted. CAR is closed.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☐ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Final Assessment

During the verification a site visit was carried out. On the basis of site visit and the reviewed project documentation/JMR/,/CAL/, it can be confirmed that the realized technology, the project equipments, as well as the monitoring and metering equipment, the project has been implemented and operated as described in the Validated PD/VCS-PD/. There are no major changes in the key equipment since the validation of the project. The project uses wind power for electricity generation. Also no change is envisaged. These facts have been verified during site visit.

☒ CAR 3.2-1 & CAR 3.2-1 are closed

3.3 Completeness of monitoring

Description

The proposed project uses CDM approved methodology AMS ID, Version 13: Grid Connected Renewable electricity Generation, which is approved under VCS 2007.1.
The project satisfies all criteria for AMS ID. The application of monitoring methodology is assessed as correct.
The monitoring plan/VCS-PD/ 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 ID 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%

Deatails	**MMCL05**	**ELP39**	**VVS28**	**ELP20**
Date of commissioning	28.10.2005	31.03.2006	20.09.2004	31.03.2006
	27.09.2006	24.07.2008	26.04 2010	19.06.2008
	28.01.2008	27.02.2010		24.07.2009
	29.12.2008			
Calibration dates	04.05.2009			

The calibration certificates of the meters were verified. Though the calibration was not done in the mentioned frequency the PP applied maximum error for the months when the calibration validity is not there. The net energy supplied is calculated for the months

where calibration non-validity months is as follows

Net electricity exported = import * (1-0.2%) – 115% * (import * (1+0.2%)) – transmission

This is in line with the EB 52 annex 60 “Guidelines for Assessing Compliance with the Calibration Frequency Requirements”.

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 2010-07-06. 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.

No significant, lack of evidence and missing data were detected during on-site visit. Nevertheless, the following CAR have been raised and closed successfully based on the revised Monitoring report

Related Findings

☐ No CARs, CLs or FARs have been identified in this context

☒ The following finding(s) have been addressed:

Finding:	**3.3-1**

Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	B-Form for the following months needs to be provided for verification • August 2006 of MMCL 05 • April 2007 to March 2008 of all connections • June 2008 of MMCL 05 • August 2008 of MMCL 05 • July 2009 of MMCL 05		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	We have enclosed here with B-form of the respective dated as required by you.		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	All the B-forms are submitted. But 1. The energy exported value of March 2008 for MMCL05 is taken wrongly from MMCL03. Please correct the same and provide the B-Form of the month 2. Net energy supplied value for February 2008 of MMCL 05 is not matching with the B-Form CAR is Open		
Corrective Action #2	1. Now the value is taken from MMCL05 and the respective B-Form is submitted for verification 2. The typographical error has corrected in the revised ER sheet & the MR.		
DOE Assessment #2	1. The value is taken from MMCL05 which is matching with the submitted B-Form of the respective month. 2. The values are corrected in the MR & ER sheet which is now matching with the B-Form values Hence CAR is closed		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☐ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Finding:	**3.3-2**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The values of net energy exported to grid mentioned in MR is not matching with the B-Form for the following months • June 2006, July 2006 & August 2006 of VVS 28 • January 2007 MMCL 05 • June 2006 & September 2006 of ELP 39 • June 2006 & October 2006 of ELP 20 • April 2008 to March 2009 of VVS 28 • April 2008 to June 2008 of ELP 39 • February 2009 of ELP 39 • May 2008 of ELP 20 • February 2008 of ELP 20 • July 2008 & October 2008 of MMC L05 • April 2009, August 2009 & October 2009 of VVS 28 • October 2009, November 2009 & December 2009 of MMCL 05		

Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	All the values are corrected in the revised MR & ER sheet
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The values of the net energy exported to grid are corrected in the revised MR & ER sheet which is now matching with the B-Form value CAR is Closed
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding:	**3.3-3**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	As per the validated PD the energy meters should be calibrated once in a year. But the meters are not calibrated with the frequency mentioned in the PD during the monitoring period. Please refer EB 52 Annex 60. Please submit the calibration certificates.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The calibration of the meters is not in the hands of PP. The BESCOM personal will calibrate the meters with their own schedule depends upon their staff availability. However the energy exported to grid and imported from grid are adjusted with the maximum permissible error as per the EB 52 Annex 60 guidance. Since the all the meter accuracy is 0.2%, the net electricity supplied to grid is calculated as follows for the months where the calibration validity is not there. Net electricity exported = import * (1-0.2%) – 115% * (import * (1+0.2%)) – transmission loss All the available calibration certificates are provided for verification.		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The calibration certificates are submitted. Since the meters are not calibrated once in a year as mentioned the validated PD the maximum possible error of 0.2% is applied to both export & import for the months when the calibration validity is not there. This is found in line with the EB 52 Annex 60 CAR is closed		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Finding:	**3.3-1**		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The monitoring period is not consistent throughout the MR.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	We have rectified the monitoring period as 1st April 2006 to 31st December 2009		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Now the monitoring period is made consistent throughout the MR. CL is closed.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Finding:	**3.3-2**		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Please clarify whether any meter for any of the WTGs were repalced during the monitoring period or not.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	No meter is changed during the monitoring period.		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	PP conforms the meters are not replaced during the monitoring period. Also it is verified with available calibration certificates.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☐ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Final Assessment

All relevant evidences/JMR/, /cal/ regarding the monitoring were fully checked by the verification team during the on-site visit. All evidences are clearly identifiable and

assessed to be correct. It could be evidenced that the monitoring system ensures for continuous operation. For the considered monitoring period, all indicators stated in the applicable monitoring methodology AMS ID (Version 13) and the registered PD/VCS-PD/ were correctly monitored and reported.

☒ CAR 3.3-1, CAR 3.3-2, CAR 3,3-3, CL 3.3-1 & CL 3.3-2 are closed

3.4 Accuracy of emission reduction calculations

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

For the months were the calibration validity is not there the net electricity exported to grid is calculated as follows

Net electricity exported to grid = (1-0.2%)*electricity supplied to grid – (1+0.2%)*115% of electricity drawn from grid – transmission loss

The net electricity is noted from joint meter reading/JMR/ on monthly basis which is duly signed by the PP and BESCOM in the B-FORM/JMR/, 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 validation team is convinced of the result of the emission coefficient calculation and emission reduction calculation/ER/. Also the emission reduction calculation is calculated based on the net electricity exported to the grid after applying the apportioning adjustments. It is deemed to be adequate, transparent and conservative.

The total net electricity supplied by the two WTGs during the monitoring period is 117,475 MWh. The baseline emission factor has been fixed ex-ante as 0.9269 tCO_2/MWh based on the CO_2 Baseline Database for the Indian Power Sector, User Guide (Version 4, Date: October, 2008) issued by CEA for NEWNE Grid/CEA/. Based on the net electricity supplied and the emission factor the net emission reductions are 108,886 tCO_{2e}.

All the figures as per the monitoring plan were cross-checked by the verification team against basic monitored data and the calculations were found correct. The verification team has checked the input values as well as the computation in the emission reduction spreadsheet/ER/. The estimation of the emission reduction was realized in a transparent and conservative manner. Thus the emission reduction achieved in the first verification period (from 2006-04-01 to 2009-12-31 (incl. both days)) is 108,886 tCO_2e.

Related Findings

☐ No CARs, CLs or FARs have been identified in this context

☒ The following finding(s) have been addressed:

Finding:	**3.4-1**		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	As conservativeness the emission reduction needs to be rounded down for every year.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The emission reduction is rounded down in ER sheet and the same has corrected in the MR.		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Emission reduction is rounded down every year. CL is closed		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Final Assessment

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. It could be evidenced that the monitoring system ensures for continuous operation. For the considered verification period, all indicators stated in the applicable monitoring methodology AMS ID (Version 13) were correctly monitored and reported. Hence all the value applied for emission reduction calculation is found to be accurate and correct.

☒ CL 3.4-1 is closed

3.5 Quality of evidence to determine emission reductions

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/VCS-PD/.

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/MR/. The calibration records are reviewed. Calibration has not been carried out with frequency mentioned in the monitoring plan. Hence as per EB 52 Annex 60 the maximum possible error has been applied for the electricity generation.

The net electricity supplied to grid by the WTGs belonging to the project activity as reported in the monitoring report/MR/ and the emission reduction calculation sheet/ER/ were verified with the B-Forms/JMR/ 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/scada/, 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/VCS-PD/

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.

Related Findings

☒ No CARs, CLs or FARs have been identified in this context

Final Assessment

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. Though the energy meters are not calibrated as mentioned validated the maximum possible error was applied to the emission reduction which is in line with the EB 52 Annex 60. 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 /VCS-PD/. 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/VCS-PD/

3.6 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/VCS-PD/. This was verified during the on site assessment conducted by the verification team on 2010-07-06

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/en/ 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/VCS-PD/.

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 not calibrated in the reported monitoring period. Hence the electricity data were adjusted as per EB 52 Annex 60. The monitoring report therefore satisfies the calibration procedure followed and the calibration frequency for the energy meters

Related Findings

☒ No CARs, CLs or FARs have been identified in this context

Final Assessment

The monitoring procedures and responsibilities are documented in a written form and is followed as described in the Validated PD/VCS-PD/. Routines for the archiving of data are defined and documented. Calculations are laid down in the monitoring report is in line with validated PD/VCS-PD/.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.

4 VERIFICATION STATEMENT

The verification statement will be provided as part of the final verification report.

M/s. Mineral Enterprises Ltd. has commissioned the TÜV NORD JI / CDM Certification Program to carry out the verification of the Project "15 MW Grid Connected Renewable Energy Wind Turbine Project in Karnataka" in Karnataka, India with regard to the requirements of VCS 2007.1 Standard.

The project activity involves generation of renewable electricity from 15 MW windmills which is being supplied to southern grid of India.

Reporting period: From 2006-04-01 to 2009-12-31

In the course of the verification 5 Corrective Action Requests (CARs), 3 Clarification Requests (CLs) were successfully closed. And there is no Forward Action Request (FAR) raised during verification.

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The verification is based on the draft monitoring report, revised monitoring report, the monitoring plan as set out in the validated PD, the validation report, emission reduction calculation spreadsheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

In detail the conclusions can be summarised as follows:

- all operations of the project are implemented and installed as planned and described in the validated project description.
- the monitoring plan is in accordance with the applied approved methodology ,ie, AMS ID Version 13
- the installed equipment essential for measuring parameters required for calculating emission reductions is calibrated appropriately.
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of the 1st periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

	2006	**2007**	**2008**	**2009**	**Total ER in the monitoring period**
Baseline emission (tCO_2e)	25607	28126	27873	27280	108886
Project emission (tCO_2e)	0	0	0	0	0
Emission reduction (tCO_2e)	25607	28126	27873	27280	108886

Bangalore, 2011-03-28

Ma. Paa. Puratchikkanal

TÜV India Pvt. Ltd., Bangalore

Verification Team Leader

Essen, 2011-03-28

Rainer Winter

TÜV NORD JI/CDM Certification Program

Final Approval

5 REFERENCES

Table 5-1: Documents provided by the project participant

Reference	Document
/cal/	Calibration certificates of the energy meters involved in the monitoring of the project activity
/ER/	Emission reduction calculation sheet
/INV/	Power supplied invoice copies submitted to the BESCOM
/JMR/	B-Forms given by BESCOM for every month covering the monitoring period
/MR/	Monitoring report of the project "15 MW Grid Connected Renewable Energy Wind Turbine Project in Karnataka" Version 01 dated February 2010 Monitoring report of the project "15 MW Grid Connected Renewable Energy Wind Turbine Project in Karnataka" Version 02 Monitoring report of the project "15 MW Grid Connected Renewable Energy Wind Turbine Project in Karnataka" Version 03 dated 20 September 2010
/PPA/	Power Purchase Agreements between Bangalore Electricity Supply Company Limited and Mineral Enterprises Limited dated 27th February 2006. Power Purchase Agreements between Bangalore Electricity Supply Company Limited and Mineral Enterprises Limited dated 4th April 2006. Power Purchase Agreements between Bangalore Electricity Supply Company Limited and Mineral Enterprises Limited dated 14th June 2006.
/QA/QC/	Internal quality assurance and quality control records and procedures
/scada/	Daily energy generation reading of individual wind mills taken from SCADA
/TD/	Technical details of the wind mills.
/Val/	Final Validation report of the project 15 MW Grid Connected Renewable Energy Wind Turbine Project in Karnataka" dated 2009-11-10
/VCS-PD/	Validated VCS Project Description of the project "15 MW Grid Connected Renewable Energy Wind Turbine Project in Karnataka" Version 04 dtd 10-11-2009

Table 5-2: Background investigation and assessment documents

Reference	Document
/AMSID/	Approved CDM Methodology AMS I D, version 13: "Grid connected renewable electricity generation"
/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/IPPC/	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book
/ISO 14064/	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
/ISO14065/	Greenhouse gases -- Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition
VCS	Voluntary Carbon Standard 2007.1
/VDS-PD-T/	VCS PD Template
/VVM/	Validation and Verification Manual (Version as per EB 51)

Table 5-3: Websites used

Reference	Link	Organisation
/cd4cdm/	www.cd4cdm.org	UNEP Riso Centre
/cea/	http://www.cea.nic.in/	Central Electricity Authority
/en/	http://www.enerconindia.net/index.jsp	Enercon India Limited
/ipcc/	www.ipcc-nggip.iges.or.jp	IPCC publications

Reference	Link	Organisation
/unfccc/	http://cdm.unfccc.int	UNFCCC
/vcs/	www.v-c-s.org	VCSA

Table 5-4: List of interviewed persons

Reference	MoI[1]		Name	Organisation / Function
/IM01/	V	☒ Mr. ☐ Ms	Sanjay	Mineral Enterprises Limited
/IM02/	V	☒ Mr. ☐ Ms.	Prabhakar	Consultant

[1)] Means of Interview: (**T**elephone, **E**-Mail, **V**isit)