VOLUNTARY CARBON STANDARD 2007.1

VERIFICATION REPORT

8.35 MW WIND POWER PROJECT AT GUDDARANGAVANA HALLI, DISTRICT CHITRADURGA, STATE KARNATAKA IN INDIA

Monitoring Period: 2006-04-01 to 2009-03-31
(incl. both days)

Report No: 53605908 - 08/634

Date: 2011-08-25

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Name of Verification company:	Date of the issue:
TÜV NORD CERT GmbH	2011-08-25
Report Title:	**Approved by:**
8.35 MW wind power project at Guddarangavana Halli, District Chitradurga, State Karnataka in India	
Client:	**Project Title:**
MSPL Limited	8.35 MW wind power project at Guddarangavana Halli, District Chitradurga, State Karnataka in India

Summary:

MSPL Limited has commissioned the TÜV NORD JI / CDM Certification Program to carry out the verification of the Project "8.35 MW wind power project at Guddarangavana Halli, District Chitradurga, State Karnataka in India" with regard to the requirements of VCS 2007.1 Standard.

The project activity comprises of installation and operation of eight numbers of 950 kW Wind Electricity Generators (WEGs) and one number of 750 kW WEG having a combined wind power generation capacity of 8.35 MW. The WEGs are supplied by Vestas Wind Technology (Formerly NEG Micon). The project supplies electricity to the Southern grid of India, thereby replacing use of fossil fuels, and contributing to GHG reductions.

Reporting period: From 01-04-2006 to 31-03-2009

In the course of the verification 6 Corrective Action Requests (CARs), 3 Clarification Requests (CLs) were successfully closed. No Forward Action Request (FAR) was raised.

The verification is based on the draft monitoring report /MR1/, revised monitoring report /MR4/, and the monitoring plan as set out in the validated PD/VCS-PD/, the validation report/FValR/, emission reduction calculation spreadsheet/XLS 4/ 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 60,149 t CO_2 equivalents

Work carried out by:	TR:	Number of pages:
Ma. Paa. Puratchikkanal C. Indumathi Shailendra Kewat Narendra Kumar	Kunal Rami Nareshkumar Suneja	41

Abbreviations

BESCOM	Bangalore Electricity Supply Company
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CMS	Central Monitoring System
CO_2	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
CP	Certification Program
CL	Clarification Request
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
KERC	Karnataka Electricity Regulatory Commission
KPTCL	Karnataka Power Transmission Corporation Limited
MP	Monitoring Plan
MR	Monitoring Report
O&M	Operation and Maintenance
PE	Project Emissions
PPA	Power Purchase Agreement
QC/QA	Quality control/Quality assurance
SC	Share certificates
SEB	State Electricity Board
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

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1 INTRODUCTION

The client, MSPL Limited has commissioned the TÜV NORD JI/CDM Certification Program to carry out the verification of the project:

"8.35 MW wind power project at Guddarangavana Halli, District Chitradurga, State Karnataka in India"

with regard to the relevant requirements of the Voluntary Carbon Standard 2007.1[1] The verifiers have reviewed the implementation of the monitoring plan (MP) in the registered VCS project for the monitoring period 2006-04-01 to 2009-03-31.

The applied monitoring methodology is AMS-I.D, Version 13 "Grid connected renewable electricity generation"[2].

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] http://www.v-c-s.org/
[2] http://cdm.unfccc.int/methodologies/index.html

1.2 Scope and Criteria

The verification of this project is based on the validated project design document /VCS-PD/, the monitoring report/MR4/, emission reduction calculation spread sheet/XLS 4/, 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	8.35 MW wind power project at Guddarangavana Halli, District Chitradurga, State Karnataka in India
Project owner	MSPL LIMITED
Any specific project categories	☐ Mega project (> 10^6 t CO_{2eq} / a) ☒ Project (> 5000 t CO_{2eq} / a < 10^6 t CO_{2eq} / a) ☐ Micro project (< 5000 t CO_{2eq} / a) ☐ AFOLU project ☐ Grouped project ☐ No specific project category
VCS PD dated	2009-11-10
Applied Methodology	Grid connected renewable electricity generation
Project starting date	2003-03-21
Crediting period	☒ Renewable Crediting Period (10 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:	Guddadarangavana Halli, Chikkappana Halli and Gonur		
Latitude and Longitude		Latitude (N)	Longitude (E)

No.	Project Location		
	MSPL-01	14˚18'04"	76˚ 23'39"
	MSPL-02	14˚18'58"	76˚ 23'30"
	MSPL-03	14˚18'53"	76˚ 23'33"
	MSPL-04	14˚18'44"	76˚ 23'34"
	MSPL-05	14˚18'42"	76˚ 23'34"
	MSPL-06	14˚18'36"	76˚ 23'34"
	Ramgad-01	14˚18'31"	76˚ 23'38"
	Ramgad-02	14˚19'38"	76˚ 22'23"
	Ramgad-03	14˚16'45"	76˚ 25'07"

1.3.3 Technical Project Description

The project utilizes wind power for electricity generation. The total installed capacity is 8.35 MW {(8 x 0.95 MW) and (1x 0.75 MW)} The annual estimated power generation for each of the 950 kW WEG is 22, 05,330 kWh and for the 750 kW WEG, it is 17, 41,050 kWh. The WEGs supplied by Vestas Wind Technology (Formerly NEG Micon) an ISO 9001 certified company. .

Supporting documents such as technical specifications /TD/ of the WEGs were made available to the TÜV NORD. The technical specification /TD/ issued by Vestas Wind Technology, clearly specifies the technical details for the WEGs. This was also confirmed during the interviews with the PP and the on-site visit.

The key parameters of the project are given in table 1-3:

Table 1-3a: Technical data of the project

Parameter	Unit		Value
		WEG 750	**WEG 950**
Nominal Output	kW	750	950
Power Regulation	-	Stall	Stall
Cut – in speed	m/s	4	3.5
Cut – out speed	m/s	25	25
Rotor			
Rotor diameter	m	48.2	54.5
Rotor swept area	(m^2)	1824	2333
Number of blades	-	3	3
Rotor revolutions	rpm	22/15	22/15
Rotor placing	-	Upwind Rotor	Upwind Rotor
Generator			
Type		Asynchronous, 4/6 pole	Asynchronous, 4/6 pole
Nominal Voltage	V	690	690
Nominal Frequence	Hz	50	50
Name plate rating	kW	750/200	950/200
Cooling	-	Liquid cooled with pump	Liquid cooled with pump

Parameter	Unit		Value
Tower			
Type	-	Conical, steel, painted	Conical, steel, painted
Hub Height	-	According to type approvals	According to type approvals

Table 1-3b: Parameters confirmed during verification

Parameter	Name	Unit	Value
Net electricity supplied to the grid during the monitoring period	EGy*	kWh	64,931,801

*Net electricity supplied to grid is calculated based on the measured values of “export” and “import” on the meter at the delivery point (at the project site), where joint reading is taken by project proponent representative and BESCOM/KPTCL officials. The meter at the final uploading point to grid (at the connected substation) is common to the project activity and other wind turbines in the wind farm that are not under this project activity. The meters at the connected substation record the electricity exported and imported by all wind turbines which are part and also not part of the project activity. The joint meter reading at the connected substation is used to estimate the transmission losses from the WEGs. Based on the joint meter reading taken at the project site and the connected substation, BESCOM prepares the Share Certificate,which indicates the net electricity supplied by the project activity.

The reading recorded in this share certificate /SC/, issued by BESCOM, will be used to calculate actual GHG emission reductions by the project activity.

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 the personnel for the technical review and the final approval were 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** [3]	**Technical competence** [4]	**Verification competence** [5]	**Host country Competence**	**Team Leading competence**
☒ Mr. ☐ Ms.	Ma. Paa. Puratchikkanal	TUV India Private Limited	TL	SA	☒	T	☒	☒	☒

	Name	Company	Function [1]	Qualification Status [2]	Scheme competence [3]	Technical competence [4]	Verification competence [5]	Host country Competence	Team Leading competence
☐ Mr. ☒ Ms.	C. Indumathi	TUV India Private Limited	TM	A	☒	T	☒	☒	☐
☒ Mr. ☐ Ms.	Shailendra Kewat	TUV India Private Limited	TM	A	☒	T	☒	☒	☐
☒ Mr. ☐ Ms.	Narendra Kumar	TUV India Private Limited	-	T	☐	-	☒	☒	☐
☒ Mr. ☐ Ms.	Kunal Rami	TÜV NORD CERT	TR[3]	A	☒	1.2	☒	☒	☒
☒ Mr. ☐ Ms.	Nareshkumar Suneja	TUV India Private Limited	OR[3]	LA	☒	1.2	☒	☒	☐
☒ Mr. ☐ Ms.	Stefan Winter	TÜV NORD CERT	FA[3]	SA	☒	1.2	☒	☐	☒

1) TL: Team Leader; TM: Team Member, TR: Technical review; OT: Observer-Team, OR: Observer-TR; FA: Final approval

2) GHG Auditor Status: A: Assessor; LA: Lead Assessor; SA: Senior Assessor; T: Trainee; TE: Technical Expert

3) GHG auditor status (at least Assessor)

4) As per S01-MU03 or S01-VA070-A2 (such as 1.1, 1.2, …)

5) In case of verification projects

A) Team Member: GHG auditor (at least Assessor status), Technical Expert (incl. Host Country Expert or Verification Expert), not ETE

B) No team member

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
- Desk review of the Monitoring Report[/MR1/] 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	2008-11-13
On-site visit	2010-04-14
Draft reporting finalised	2010-04-20
Technical review on draft reporting finalised	2010-04-22
Final reporting finalised	2011-08-25
Technical review on final reporting finalised	2011-08-25
Final corrections	-

The main verification steps are described below.

2.1 Review of Project Documentation

The VCS PD /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 O&M is performed by Vestas Wind Technology (Formerly NEG Micon), which is an ISO 9001 certified company. The QA/QC procedures have been established, as was evident during the site visit. The main parameters to be monitored are the net electricity supplied by the project activity to the grid. Net electricity supplied to grid will be calculated based on the measured values of “export” and “import” on the meter at the delivery point (at the project site), where joint reading is taken by project proponent representative and BESCOM/KPTCL officials. Every month these meter readings will be recorded by site in-charge and the state utility personnel and the records will be archived for crosschecking yearly figures. The meters at the project site as well as at the connected substation will be tri-vector meters. The apportioning procedure for arriving at the net electricity supplied by the project activity to the grid (as indicated in the Share Certificate issued by BESCOM) is under the control of BESCOM/KPTCL. The reading (i.e. net electricity supplied to grid) recorded in the said share certificate, issued by BESCOM, will be used to calculate actual GHG emission reductions by the project activity. During the site visit, the verification team has analyzed the QA/QC procedures established by the O&M provider and reviewed the electricity measurement and recording procedures from state electricity board. The accuracy of the measurements is assessed as high, because all measurement devices are of 0.2 accuracy class and are duly calibrated. The energy meters are calibrated annually by the KPTCL. Calibration reports/CAL07, CAL08, CAL-BM/ for the years 2007, 2008 were verified. Thus the verification team concludes that the emission reductions reported in the MR/MR4/ and the ER sheet/XLS4/ are conservative and accurate.

During the onsite-visit the data recorded and stored including the share certificates/sc/ reports duly signed by the representatives of BESCOM submitted by the PP were verified. The procedure was thus found to be in line with the monitoring plan /PD/ and the PPA/PPA /signed for the project and deemed to be OK. The monthly and yearly generation data stored online was verified and found to be OK.

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 (MSPL Limited) Project consultant (Deloitte Touche Tohmatsu India Pvt. Ltd.)	- General aspects of the project - Technical equipment and operation - Changes since validation - Monitoring and measurement equipment - Remaining issues from validation Calibration procedures - Quality management system - Involved personnel and responsibilities - Training and practice of the operational personnel - Implementation of the monitoring plan - Monitoring data management - Data uncertainty and residual risks - GHG calculation - Procedural aspects of the verification - Maintenance - Environmental aspects - Editorial issues of the Monitoring Report

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

2.2.3 Collection of Measurements

The monitoring equipment consists of the energy meters of accuracy 0.2s measuring import and export to the grid, and the online CMS system (SCADA), at the project site. The energy meter readings from the meters are taken on the 1st of each month by the BESCOM officials and in the presence of representatives of the PP, and the same are recorded into a share certificate /sc/ duly signed by the BESCOM engineer. The JMRs given by BESCOM for the electricity supplied by the project activity were crosschecked with the Share certificates and thus the export and the import values in

JMRs of each month were found to tally with the export and import values of electricity mentioned in share certificates of corresponding months. The supporting documents such as the emission reduction spreadsheet /XLS2/ was verified and found to be in agreement with the share certificate /sc/.

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

The two energy meters, one main and one check, are the monitoring equipment. As per the PPA, the energy meters are required to be calibrated by the SEB periodically. During the site visit, the meter numbers, calibration dates and tamper-proof seal were verified. The details were crosschecked with the calibration reports /CAL07, CAL08, CAL-BM/ issued by the KPTCL and were found to be OK. The calibration reports were verified and the errors found to be within permissible limits.

The energy meters, operation controls and records were verified and found to be OK. The O&M contractor, Vestas Wind technology (Formerly known NEG MICON) is a recognised ISO 9001 certified company and QMS procedures are defined and practiced.

2.3 Determination of the reductions in GHG emissions

As the project is a wind power project, there are no emissions from the project activity, hence project emissions (PE) is equal to zero. Similarly, leakage is not applicable as per the approved methodology. Therefore, the baseline emissions are equal to the emission reductions. The net electricity supplied to the grid by the project is multiplied by the grid emission factor chosen ex-ante at the time of validation of the project, to determine the emission reductions achieved by the project. The net electricity supplied to the project was sourced from the share certificates and the EF of 0.927 tCO2/MWh /PD/ was used to calculate the baseline emissions. The monitoring report /MR4/ and the emission reduction spreadsheet /XLS4/ were verified and found to be OK.

2.4 Review of additional data from other sources if appropriate

Not applicable. The share certificates issued by the BESCOM for the duration of the monitoring period are the basis for calculation of emission reductions achieved by the project.

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

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. The monitoring procedures provided in the MR with respect to "net electricity supplied by the project activity" were verified and found to be in line with actual site conditions and also in line with the applied methodology AMS ID.

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	-	1	-
3.3	Completeness of monitoring	2	2	-
3.4	Accuracy of emission reduction calculations	2	-	-
3.5	Quality of evidence to determine emission reductions	1	-	-
3.6	Management and operational system	1	-	-
-	**SUM**	**6**	**3**	**0**

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

Description

There are no remaining issues from validation.

Related Findings

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

☐ The following finding(s) have been addressed:

Final Assessment

There are no remaining issues from validation. The validated VCS PD/PD/ and the final validation report/FValR/ was verified, and no remaining issues /FARs were found.

3.2 Project implementation

Description

The project activity involves 9 WEGs of total capacity of 8.35 MW in Guddadarangavana Halli, Chikkappana Halli and Gonur villages, Chitradurga District, Karnataka. The project generates electricity to be supplied to the Southern grid. During the verification a site visit was carried out. There are no major changes in the key equipment since the validation of the project. The WEGs are connected to energy meters of 0.2 class accuracy which measure the electricity supplied to the grid by the project. The meters are calibrated by the KPTCL and are under their control. The Share certificates are issued each month forms the basis for the calculation of emission reductions achieved by the project. No change of equipment is envisaged. These facts have been verified during site visit.

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 geographical coordinates of the WEG locations need to be provided in MR.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The geographical coordinates of the WEG locations are provided under Section B of 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.*	The geographical coordinates provided in the MR were cross checked from the web site http://www.satsig.net/maps/lat-long-finder.htm and found to have correctly mentioned. Moreover, the geographical coordinates given in the MR were found to tally with the coordinates mentioned in the registered PD /PD/ and the final validation report /FValR/. Hence CL 3.2-1 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

On the basis of this site visit and the reviewed project documentation, it can be confirmed that w.r.t. 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 registered VCS PD/PD/. There are no major changes in the key equipment since the validation of the project. Supporting documents such as the commissioning certificates/CR/, technical specifications of the project/TD/, power purchase agreement/PPA/ and the certificate of approval from the electrical inspectorate/ELEC/ for all electrical equipment of the project were verified and found to be OK. The Share certificates/sc/ for the monitoring period and the calibration reports/CAL07/, /CAL 08/, /CAL -BM/ were verified and found to be OK.

☒ CL 3.2-1 was closed.

3.3 Completeness of monitoring

Description

The proposed project uses CDM approved methodology AMS-I.D Version 13: Grid connected renewable electricity generation, which is approved under VCS 2007.1.

The parameter to be monitored as per the monitoring plan is the net electricity supplied to the grid by the Project. The energy meter readings (export and import) are recorded each month into the joint meter reading/JMR/ issued by the KPTCL/BESCOM. Transmission losses incurred during transmission of the electricity from the project site to the substation are taken into account by the KPTCL/BESCOM in the share certificates/sc/. It also includes and the electricity to be billed by the PP to the KPTCL/BESCOM, which is nothing but the net electricity supplied to the grid by the project. Thus, the net electricity supplied to the grid by the project, after deducting the transmission losses is considered for the calculation of emission reductions. The share certificates were checked in respect to net electricity supplied to the grid. These form the basis for the emission reduction calculation for the project. The

energy supplied to the grid during the monitoring period of 2006-04-01 to 2009-12-31 is 64,931,801 kWh.

The meters are calibrated annually as per the PPA by the BESCOM officials as per Article 7 of the PPA/PPA/. The calibration certificate /CAL 07/, /CAL 08/, / CAL -BM/ available for the entire monitoring period were checked and found to be OK.

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 2009-04-17. 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.

Nevertheless, the following CARs and CL were 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	The monitoring parameter table given under section E of		

finding *Describe the finding in unambiguous style; address the context (e.g. section)*	monitoring report is not in line with the monitoring parameter table mentioned under section 3.3 of the registered PD. Especially in sections corresponding to source of data to be used, description of measurement methods and QA/ QC procedures to be applied. Please clarify.
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The monitoring parameter table given under section E of the revised MR is now in line with the monitoring parameter table mentioned under section 3.3 of the registered PD. The source of data to be used, description of measurement methods and QA/ QC procedures to be applied, as presented under section E of the revised MR, are also in line with the monitoring parameter table mentioned under section 3.3 of the registered PD .
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 monitoring parameter table has been revised which is found to be in line with the registered PD /PD/. The measurement methods and QA/ QC procedures described in the MR for net electricity supplied to the grid were checked during on-site visit and found to have mentioned correctly in the MR. Moreover, the share certificates /SC/ corresponding to the monitoring period April 2006-March 2009 were checked in respect to the export, import, transmission loss and net electricity supplied values for each month. The net electricity supplied values mentioned in the Emission reduction calculation sheet /XLS 4/ were found to tally with the net electricity supplied values in share certificates of each month and hence the monitoring procedures mentioned in the MR is found to be OK. CAR 3.3-1 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)*	Details of all energy meters : individual and bulk meters are missing in the MR.		

Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	Details of the metering system at the project site (i.e. 4 numbers of main meters and 4 numbers of check meters), associated to the project activity, are provided under Section D of the revised MR. Details of the bulk metering system (1 number of main meter and 1 number of check meter) at the connected substation are also provided under section D of the revised 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.*	The details and serial numbers of energy meters available at the project site as well as the substation which have been provided in the MR were cross checked with the calibration reports /CAL 07/ /CAL 08/ /CAL -BM/ and found to have applied correctly. The same were cross verified during site visit and found to be correct. CAR 3.3-2 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 MR does not include 1. PP details 2. VCS Project validation approval date (final date of issue mentioned in FVAR)		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	1. PP details are provided under Annex 1 of the revised MR. 2. VCS Project Validation Approval date, i.e. the date of issue of final validation approval viz. 12 November 2009 is mentioned on the cover page of the revised 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.*	1. PP details provided in annex 1 have been checked to be correct. The details were found to tally with those mentioned in the registered PD/PD/. 2. VCS final validation approval date has been checked from final approved validation report /FValR/ and found to have mentioned correctly. CL 3.3-3 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 start date of crediting period given in MR does not match with the start date of crediting period mentioned in final VCS PD.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The start date of the crediting period in MR is 01 April 2006 and the expected start date of crediting period in the final VCS PD is 28 March 2006. The four days of the month of March 2006 (i.e. 28, 29, 30, 31 March) have been excluded from the monitoring period so as to maintain continuity in monitoring procedures.		
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 exclusion of last 4 days in the month of march 2006 is acceptable as it has been carried out to maintain continuity. Hence the crediting period starting from 1st April 20006 is found to be OK. CL 3.3-4 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

The parameter which is being monitored is the net electricity to be supplied to the grid. The parameters electricity export and electricity import are measured by two tri-vector meters of accuracy class 0.2s, from which the reading are recorded into the JMR. Transmission losses have been accounted for by the BESCOM in the share certificates, and hence not under influence of the PP. It also includes and the electricity to be billed by the PP to the KPTCL/BESCOM, which is nothing but the net electricity supplied to the grid by the project. Thus, the net electricity supplied to the grid by the project, after deducting the transmission losses is considered for the calculation of emission reductions. The values mentioned in the MR and the ER sheets are sourced from the Share certificates for each month of the monitoring period issued to the PP by the KPTCL/BESCOM. The verification team has verified the share certificates. The net electricity supplied to the grid for each month was found to tally with the values mentioned in the share certificates of corresponding months.

The project satisfies all criteria of the applicable methodology and is in line with the power purchase agreement between the PP and the KPTCL and the registered VCS PD. The application of monitoring methodology is assessed as correct.

Supporting documents such as the Share certificates /SC/, JMRs/JMR/ and invoices/INV/ have been verified and found to be OK.

☒ CARs 3.3-1, 3.3-2 and CL 3.3-1, 3.3-2 were successfully closed.

3.4 Accuracy of emission reduction calculations

Description

The net electrical energy supplied to the grid is calculated as the difference between total energy exported and the energy imported, transmission losses have been suitably subtracted as given in the share certificates. Grid emission factor times the net electrical energy supplied to the grid give the baseline emission reduction.

For the calculation of baseline emissions the ex-ante validated value of baseline parameters, i.e., Southern Regional Grid Emission Factor is taken into account. The monitoring data to calculate the emission reductions is taken from the share certificates /SC/ issued by KPTCL/BESCOM. This data is the basis for the calculation of the emission reductions as given in the spreadsheets/XLS 3/. Appropriate calculation methods, in line with the methodology are applied. The grid emission factor of 0.927

tCO_2/MWh for the Southern Grid of India has been rightly applied in this monitoring period.

The accuracy of the measurements is assessed as high, because all measurement devices are of 0.2 accuracy class and are duly calibrated. Calibration reports for the years 2007, 2008 have been verified. It was noted that the calibration reports for the meters (both main meter and check meter) at the project site were not available for the years 2005 and 2006. The delayed calibration of meters was then carried out on 1st March 2007. Hence the maximum permissible error factor of 0.2% has been applied for the 'Electricity Export', 'Electricity Import' and transmission loss values during the period from 1st April 2006 (starting date of the 1st monitoring period) to 28th February 2007 (the day before the meters were calibrated). The calibration reports dated 2007-03-01 were checked and found that the meters were within the permissible limit of +/-0.2% accuracy level. Hence the applied error factor of 0.2% as the maximum permissible error factor is acceptable and found to be OK. The electricity exported values are reduced by 0.2 % and electricity imported values are increased by 0.2 % for the period 2006-04-01 to 2007-02-28. The transmission loss values are also are increased by 0.2 % for the period 2006-04-01 to 2007-02-28. The validation team checked the emission reduction calculations/XLS 4/ which are adjusted by 0.2%by applying the maximum permissible error factor (0.2%) for all the measured values and found to be in line with Annex 60 of EB 52. Thus the total emission reduction value of 60,149 tCO2e after adjustments due to delayed calibration is verified to be conservative and OK.

Baseline Emissions:

The formula used for the determination of baseline emissions which is consistent with the PDD is:

$BE_y = EF_y \times EGy$

Where

EG_y is the net electricity supplied to grid in a given year (KWh)

EF_y is the emission factor for a given year (tonnes of CO_2/MWh)

The baseline emissions (BE) during the monitoring period are60,191 **tCO_2**.

The baseline emissions (BE) during the monitoring period after adjustments due to delayed calibration are 60,149 **tCO_2**.

Project Emission:

Since the project is a wind power project, project emissions are nil.

Emission Reduction:

Summary of Emission Reductions for the monitoring period

Parameter	**Unit**	**Before making adjustments due to delayed calibration**	**After making adjustments due to delayed calibration**
Gross Electricity Export from the project activity during the monitoring period	kWh	65,807,730	65,762,499
Electricity Import by the project activity during the monitoring period	kWh	111,366	111,419
Transmission Losses	kWh	764,563	765,400
Net Electricity supplied to the grid by the project activity during the monitoring period (EGy)	kWh	64,931,801	64,885,680
Emission Reductions (ERy)	tCO2e	60,191	60,149

Grid Emission Factor = 0.927 tCO_2/MWh

Hence the total emission reductions are **60,149** tCO_2.

Vintage wise VERs

Vintage Period	**Net Electricity Supplied to the Grid by the Project Activity (EGy)**	**Baseline Emission Factor (EFy)**	**Emission Reductions (ERy)**
01/04/2006 - 31/12/2006	19,824,776	0.927	18,377
01/01/2007 - 31/12/2007	21,485,051	0.927	19,917
01/01/2008 - 31/12/2008	20,201,585	0.927	18,727
01/01/2009 - 31/03/2009	3,374,269	0.927	3,128

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)*	The Emission Reduction calculation sheet needs to be provided.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The emission reduction calculation sheet is provided to DOE 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 emission reduction calculation for the period 01 April 2006 to 31 March 2009 has been checked. The net electricity supplied to the grid for each month have been cross checked from the share certificates /SC/ of corresponding months and the values were found to have applied correctly. Moreover the required formula for emission reduction have been included as, Base line Emission (tco_2) = Emission factor * net electricity supplied to the grid in MWh. Emission Reduction (tco_2) = Baseline emission- project emission – leakage. As there is no project emission and leakage, Emission reduction=baseline emission. The revised monitoring report /MR2/ has included the baseline emission coefficient of 0.927 tCO_2/MWh which is found to be in line with the value of grid emission factor mentioned in the registered PD /PD/. The total emission reductions by the project activity for the monitoring period from 2006-04-01 to 2009-03-31 are 60191 tCO_2. The formula and calculation used for arriving at this value of emission reductions have been verified to be correct. The validation team identifies that the frequency of the calibration has been delayed during the monitoring period and hence the PP is asked to adopt conservative approach		

	for emission reduction calculation. CAR is open.
Corrective Action #2	The calibration certificates for 2005 and 2006 are not available. Hence the maximum permissible error of 0.2% has been applied for all the values (i.e. 'Electricity Export', 'Electricity Import' and 'Transmission Losses' in the project case) in a conservative manner. The error is applied during the period between the scheduled date of calibration and the actual date of calibration.The adjustment, in all the measured values, due to delayed calibration is in line with Annex 60 of EB 52. The emission reductions generated by the project activity are calculated considering the adjusted net electricity supplied to the grid by the project during the monitoring period.
DOE Assessment #1	It was noted that the calibration reports for the meters (both main meter and check meter) at the project site were not available for the years 2005 and 2006 and the delayed calibration of meters were then carried out on 1st March 2007. Hence the maximum permissible error factor of 0.2% has been applied for the 'Electricity Export', 'Electricity Import' and transmission loss values during the period from 1st April 2006 (starting date of the 1st monitoring period) to 28th February 2007 (the day before the meters were calibrated). The calibration reports dated 2007-03-01 were checked and found that the meters were within the permissible limit of +/-0.2% accuracy level. Hence the applied error factor of 0.2% as the maximum permissible error factor is acceptable and found to be OK. Thus the electricity exported values are reduced by 0.2 % and electricity imported values are increased by 0.2 % for the period 2006-04-01 to 2007-02-28. The transmission loss values are also are increased by 0.2 % for the period 2006-04-01 to 2007-02-28. The validation team checked the emission reduction calculations/XLS 4/ which are adjusted by 0.2% by applying the maximum permissible error factor (0.2%) for all the measured values and found to be in line with Annex 60 of EB 52. Thus the total emission reduction value of 60,149 tCO2e after adjustments due to delayed calibration is verified to be conservative and OK. CAR 3.4-1 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:	**3.4-2**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	1. The total Emission Reductions (actual) mentioned in the MR need to be compared with the annual Emission Reductions mentioned in the registered PD. 2. The average PLF for the net energy generated during the monitoring period is missing in the MR.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	1. The actual emission reductions, mentioned in the MR, from the project activity for the period from 01 April 2006 to 31 March 2009 (i.e. 3 years) are 60,191 tCO2 (i.e. 20,064 tCO2 annually) and the annual emission reductions, mentioned in the registered PD, are 17,068 tCO2. The same has been compared in the MR. The plant load factor for wind power projects is driven by the wind density and wind speed which in turn are influenced by changes in the wind stress associated with seasonal variations in weather. Wind patterns for any wind farm site vary from year to year and consequently the ensuing electricity generation also varies. Any variation in PLF is beyond the control of project proponent and could not have been envisaged beforehand. 2. The average net PLF of 29.59% is archived by the project activity during the monitoring period from 01 April 2006 to 31 March 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.*	1. The comparison of actual emission reductions and the estimated emission reductions have been provided in the MR which was verified to be OK.. The increase in the VERs is due to the increase in the average PLF in the region during the monitoring period. The higher electricity generation leading to higher PLF (29.59%) when compared to the estimated one (26.5%) is acceptable as the wind speed and the wind density are influenced by the seasonal variations in weather and also by the variation in wind pattern which is beyond the control of PP. Hence increase in PLF is found to be		

	reasonable and acceptable based on site specific wind generation scenario. It was also verified even with the PLF of 29.59 %, the project IRR does not cross the benchmark 0f 10.75%, hence proving that the project additionality is not affected by the increase in PLF. Thus the increase in emission reduction because of increase in generation as compared to the estimated ones due to variation in wind pattern and high wind availability is acceptable. 2. The average PLF has been mentioned in the MR which is verified to be OK. CL 3.4-1 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

A revised ER calculation sheet/XLS2/ was prepared by the PP which was verified by the verification team. Thus it is confirmed that the ER calculation is correct and conservative. The supporting documents share certificates, JMRs and calibration reports/CAL07, CAL08, CAL- BM/ were verified and found to be OK.

☒ CAR 3.4-1 and CL 3.4-2 were closed successfully.

3.5 Quality of evidence to determine emission reductions

Description

Proper data management including data acquisition, aggregation and 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 /PD/. No significant lack of evidence and missing data were detected during on-site verification.

The net electricity supplied to the grid is taken from the share certificates/SC/ given by KPTCL/ BESCOM for the payments made for the electricity to be billed, which form

the basis for emission reduction calculations. The amount of electricity supplied to the grid by the project activity is continuously metered by the tri-vector meters of 0.2s which measure both import and export. The readings are recorded by the KPTCL/BESCOM, and hence are authentic. The meters are calibrated by KPTCL/ BESCOM and calibration reports were verified and found to be OK.

Related Findings

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

☒ The following finding(s) have been addressed:

Finding:	**3.5-1**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	1. The calibration details along with the date of recent calibration report have not been included in the MR. 2. The calibration reports available during the entire monitoring period need to be submitted.		

Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	1. The calibration details of the four numbers of main and check meters associated to the project activity have been included under Section D of revised MR. The dates of applicable calibration reports are 01.03.2007, 04.01.2008 and 02.07.2008. 2.The calibration reports for the meters at the project site dated 01.03.2007 and 04.01.2008 and for the meters at substation dated 02.07.2008 applicable for the monitoring period (i.e. from 01 April 2006 to 31 March 2009) are provided to DoE for verification. The calibration reports for the year 2005 and 2006 are not available.Hence, the emission reductions are adjusted by 0.2% to ensure the conservativeness of emission reductions. This is applied as the calibration of energy meters has been delayed and not conducted at the frequency (i.e. annually) specified in the monitoring plan. The expoted electricity has been reduced by 0.2 % and the imported electricity has been increased by 0.2 % during the period 1st April 2006 to 28th February 2007. The transmission loss values are also increased by 0.2% during the period 1st April 2006 to 28th February 2007. The error is applied during the period between the scheduled date of calibration and the actual date of calibration.The adjustment, in the measured values, due to delayed calibration is in line with Annex 60 of EB 52.

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.*	1. Calibration details have been included in section D of MR which were cross checked with calibration reports /CAL 07/, /CAL 08/, /CAL-BM/ and found to have applied correctly. 2. The calibration reports available during the period 2007, 2008 /CAL 07/, /CAL 08/, /CAL -BM/ have been submitted which were checked to be OK. As there was no calibration report during the year 2005-2006 and the meters were subjected to delayed calibration, the error factor has been considered in emission reduction calculation /XLS4/. The maximum permissible error factor of 0.2% has been applied for the 'Electricity Export', 'Electricity Import' and transmission loss values during the period from 1st April 2006 (starting date of the 1st monitoring period) to 28th February 2007 (the day before the meters were calibrated). The calibration reports dated 2007-03-01 were checked and found that the meters were within the permissible limit of +/-0.2% accuracy level. Hence the applied error factor of 0.2% as the maximum permissible error factor is acceptable and found to be OK. Thus the electricity exported values are reduced by 0.2 % and electricity imported values are increased by 0.2 % for the period 2006-04-01 to 2007-02-28. The transmission loss values are also are increased by 0.2 % for the period 2006-04-01 to 2007-02-28. The validation team checked the emission reduction calculations /XLS4/ which are adjusted by 0.2% by applying the maximum permissible error factor (0.2%) for all the measured values and found to be in line with Annex 60 of EB 52. CAR 3.5-1 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

The significant documentary evidence in support of the net electricity supplied to the grid is the share certificates verified and crosschecked with the invoices released to

the BESCOM. The annual calibration reports were verified by the verification team and found to be OK. The ERs thus reported are conservative and accurate. It is evident from the monitoring data that the monitoring system ensures continuous operation, no major break down has been found to occur during the monitoring period. As Vestas wind Technology is an ISO 9001 certified company, QMS procedures are already in place. All internal data are subjected to QA/QC measures. All monitored data are archived in Electronic form. These were verified during the site visit and found that proper procedures were adopted for data handling.

Supporting documents such as share certificates, JMRs and calibration reports and invoices were verified and found to be OK.

3.6 Management and operational system

Description

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. The monitoring personnel at site are well trained and follow reproducible routines as was evident during the site visit. Training records/TRNG/ were verified and found to be OK. Representatives from the O&M 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. A combination of competent personnel and on –the –job training is the procedure practiced for all monitoring personnel. This ensures that competent people carry out tasks with sufficient accuracy. All necessary monitored and measured raw data were checked during on-site verification.

Related Findings

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

☒ The following finding(s) have been addressed:

Finding:	**3.6-1**		
Classification	☒ CAR	☐ CL	☐ FAR

Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The MR does not include the details regarding QA /QC like organisational structure, competencies, non-conformance handling, internal audits and management review.
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The details regarding QA/QC as detailed in the registered PD are also included under Section D and E of the revised 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.*	The required QA /QC details have been correctly included in the MR which was verified to be in line with the registered PD and on-site conditions. CAR 3.6-1 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

As Vestas wind technology is an ISO 9001 certified company with a pre-defined QMS in place, the management and operation of equipment, handling and storage and data, and training of monitoring personnel. This was verified during the site visit and supporting documents on training conducted for monitoring personnel.

☒ CAR 3.6-1 was closed during the course of the verification.

4 VERIFICATION STATEMENT

MSPL Limited has commissioned the TÜV NORD JI / CDM Certification Program to carry out the verification of the Project "8.35 MW wind power project at Guddarangavana Halli, District Chitradurga, State Karnataka in India" with regard to the requirements of VCS 2007.1 Standard.

The project activity comprises of installation and operation of eight numbers of 950 kW Wind Electricity Generators (WEGs) and one number of 750 kW WEG having a combined wind power generation capacity of 8.35 MW. The WEGs supplied by Vestas Wind Technology (Formerly NEG Micon). The project supplies electricity to the Southern grid of India, thereby replacing use of fossil fuels, and contributing to GHG reductions.

Reporting period: From 01-04-2006 to 31-03-2009

In the course of the verification 6 Corrective Action Requests (CARs), 3 Clarification Requests (CLs) were successfully closed. No Forward Action Request (FAR) was raised.

The verification is based on the draft monitoring report, revised monitoring report, and 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 ,i.e., AMS I.D Ver 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:

	April-06 to Dec-06	**Jan-07 to Dec-07**	**Jan-08 to Dec-08**	**Jan-09 to Mar-09**	**Total**
Project emissions (t CO2e)	0	0	0	0	0
Baseline emissions (t CO2e)	18,377	19,917	18,727	3,128	60,149
Emission reductions (t CO2e)	18,377	19,917	18,727	3,128	**60,149**

Bangalore, 2011-08-25

Ma Paa Puratchikkanal

TÜV NORD JI/CDM Certification Program

Verification Team Leader

Essen, 2011-08-25

Stefan Winter

TÜV NORD JI/CDM Certification Program

Final Approval

5 REFERENCES

Table 5-1: Documents provided by the project participant

Reference	Document
/CAL07/	Calibration report (DVG/RT/WF-62/591-95) issued by KPTCL for 0.2S tri-vector meters 02260379 (M) and 02307545(C) of MSPL Limited for 1 x 0.95 MW WTG dated 2007-03-01. Calibration was performed on 2007-02-25. Calibration report (DVG/RT/WF-78/596-600) issued by KPTCL for 0.2S tri-vector meters 02312419 (M) and 02312420 (C) of MSPL Limited for 5 x 0.95 MW of WTGs dated 2007-03-01. Calibration was performed on 2007-02-25. Calibration report (DVG/RT/WF-77/601-05) issued by KPTCL for 0.2S tri-vector meters 02312418 (M) and 02312417 (C) of RMML Limited for 2 x 0.95 MW of WTGs dated 2007-03-01. Calibration was performed on 2007-02-25. Calibration report (DVG/RT/WF-110/606-10) issued by KPTCL for 0.2S tri-vector meters 04186295 (M) and 04186298 (C) of RMML Limited for 1 x 0.75 MW of WTGs dated 2007-03-01. Calibration was performed on 2007-02-25.
/CAL08/	Calibration report issued by KPTCL for 0.2S tri-vector meters 02260379 (M) and 02307545(C) of MSPL Limited for 1 x 0.95 MW WTG. Calibration was performed on 2008-01-04 and on 2008-07-02. Calibration report issued by KPTCL for 0.2S tri-vector meters 02312419 (M) and 02312420 (C) of MSPL Limited for 5 x 0.95 MW of WTGs. Calibration was performed on 2008-01-04 and on 2008-07-02. Calibration report issued by KPTCL for 0.2S tri-vector meters 02312418 (M) and 02312417 (C) of RMML Limited for 2 x 0.95 MW of WTGs. Calibration was performed on 2008-01-04 and on 2008-07-02. Calibration report issued by KPTCL for 0.2S tri-vector meters meters 04186295 (M) and 04186298 (C) of RMML Limited for 1 x 0.75 MW of WTGs. Calibration was performed on 2008-01-04 and on 2008-07-02.
/CAL- BM/	Calibration report issued by BESCOM for 66kV bulk meters of 0.2S tri-vector meters 02307391 (M) and 02374009 (C) for Line #1 and the meters 02307393 (M) and 02307394 (C) for Line #2. Calibration was performed on 07-01-2008 and 2008-07-02.

Reference	Document
/CR/	Commissioning certificates dated 21.03.2003 for 1 number of 950 KW WTG of MSPL Limited from KPTCL. Commissioning certificate dated 30.09.2003 of 5x950 KW (4.75 MW) WTGs of MSPL Limited from KPTCL. Commissioning certificate dated 30.09.2003 of 2x950 KW (1.9 MW) WTGs of RMML Limited from KPTCL. Commissioning certificate dated 19.05.2004 of 1x750 KW (0.75 MW) WTG of RMML Limited from KPTCL.
/ELEC/	Electrical Inspectorate letter from Government of Karnataka for the approval of 1 x 950 KW WTG for MSPL Limited dated 14.05.2003. Electrical Inspectorate letter from Government of Karnataka for the approval of 5 x 950 KW WTGs for MSPL Limited dated 24.09.2003. Electrical Inspectorate letter from Government of Karnataka for the approval of 2x 950 KW WTGs for Ramgad Minerals and Mining Private Limited dated 24.09.2003. Electrical Inspectorate letter from Government of Karnataka for the approval of 1x 750 KW WTGs for Ramgad Minerals and Mining Private Limited dated 30.03.2004.
/INV/	Invoices raised to BESCOM by MSPL Limited for the wind electricity charges for the period April 2006 to March 2009 for 1 x 950 KW WTG and 5 x 950 KW WTGs. Invoices raised to BESCOM by Ramgad Minerals and Mining Private Limited for the wind electricity charges for the period April 2006 to March 2009 for 2x 950 KW WTG and 1x 750 KW WTGs.
/JMR/	Joint meter readings of the net electricity exported at 33 kV metering point measured of MSPL Limited for 1 x 0.95 MW WTG at G.R. Halli, Chitradurga issued by KPTCL, from April 2006 to March 2009 for the duration of the monitoring period 2006-04-01 to 2009-03-31. Joint meter readings of the net electricity exported at 33 kV metering point measured of MSPL Limited for 5 x 0.95 MW WTG at G.R. Halli, Chitradurga issued by KPTCL, from April 2006 to March 2009 for the duration of the monitoring period 2006-04-01 to 2009-03-31.

Reference	Document
	Joint meter readings of the net electricity exported at 33 kV metering point measured of Ramgad Minerals and Mining Private Limited for 2 x 0.95 MW WTG at G.R. Halli, Chitradurga issued by KPTCL, from April 2006 to March 2009 for the duration of the monitoring period 2006-04-01 to 2009-03-31. Joint meter readings of the net electricity exported at 33 kV metering point measured of Ramgad Minerals and Mining Private Limited for 1 x 0.75 MW WTG at Gonur, Chitradurga issued by KPTCL, from April 2006 to March 2009 for the duration of the monitoring period 2006-04-01 to 2009-03-31.
/MR1/ **/MR2/** **/MR3/** **/MR4/**	1. Monitoring Report "8.35 MW wind power project at Guddarangavana Halli, District Chitradurga, State Karnataka in India" for the period 2006-04-01 to 2009-03-31, version 1.0 dated 2010-02-27. 2. Monitoring Report "8.35 MW wind power project at Guddarangavana Halli, District Chitradurga, State Karnataka in India" for the period 2006-04-01 to 2009-03-31, version 2.0 dated 2010-09-01. 3. Monitoring Report "8.35 MW wind power project at Guddarangavana Halli, District Chitradurga, State Karnataka in India" for the period 2006-04-01 to 2009-03-31, version 3.0 dated 2011-05-23. 4. Monitoring Report "8.35 MW wind power project at Guddarangavana Halli, District Chitradurga, State Karnataka in India" for the period 2006-04-01 to 2009-03-31, version 4.0 dated 2011-08-21
/O&M/	Operation and Maintenance contract between NEG Micon Private Limited and MSPL Limited for 1 x 950 KW WTG dated 20053-03-04. Operation and Maintenance contract between NEG Micon Private Limited and MSPL Limited for 5 x 950 KW WTGs dated 2003-07-29. Operation and Maintenance contract between NEG Micon Private Limited and Ramgad Minerals and Mining Private Limited for 1 x 750 KW WTGs dated 2003-12-30. Operation and Maintenance contract between NEG Micon Private Limited and Ramgad Minerals and Mining Private Limited for 2 x 950 KW WTGs dated 2003-07-229.
/ORG/	Organization structure of Vestas wid technology (formerly known as NEG Micon Private Limited), in charge of the monitoring and maintenance operations.

Reference	Document
/PPA/	Power Purchase Agreements between KPTCL and MSPL Limited for 4.75 MW WTGs dated 11.02.2004 Power Purchase Agreement between KPTCL and MSPL Limited for 0.95 MW WTG dated 7.08.2003 Power Purchase Agreement between KPTCL and Ramgad Minerals and Mining Private Limited for 1.9 MW WTGs dated 11.02.2004 Power Purchase Agreement between KPTCL and Ramgad Minerals and Mining Private Limited for 0.75 MW WTG dated 05.03.2005
/SC/	Share certificates given by State Power Procurement Co-ordination centre towards power purchased from MSPL Limited, stating the net electricity supplied to the grid from 0.95 MW WTG and net amount payable during April 2006 to March 2009. Share certificates given by State Power Procurement Co-ordination centre towards power purchased from MSPL Limited, stating the net electricity supplied to the grid from 5 x 0.95 MW WTGs and net amount payable during April 2006 to March 2009. Share certificates given by State Power Procurement Co-ordination centre towards power purchased from Ramgad Minerals and Mining Private Limited, stating the net electricity supplied to the grid from 2 x 0.95 MW WTGs and net amount payable during April 2006 to March 2009. Share certificates given by State Power Procurement Co-ordination centre towards power purchased from Ramgad Minerals and Mining Private Limited, stating the net electricity supplied to the grid from 1 x 0.75 MW WTG and net amount payable during April 2006 to March 2009.
/TD/	Technical specification of the WTGs for 950 KW and 750 KW
/TRNG/	Training records for monitoring personnel in the inspection and working of electrical equipment, and safety conducted by Vestas wid technology (formerly known as NEG Micon Private Limited).
/XLS 1/ **/XLS 2/**	Emission calculation sheet provided by the project participant w.r.t /MR1/ Emission calculation sheet provided by the project participant w.r.t /MR2/

Reference	Document
/XLS 3/	Emission calculation sheet provided by the project participant w.r.t /MR3/
/XLS 4/	Emission calculation sheet provided by the project participant w.r.t /MR4/

Table 5-2: Background investigation and assessment documents

Reference	Document
/AMS I.D/	Approved CDM Methodology AMS I.D, version 13: "Grid connected electricity generation"
/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/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
/VCS-PD/	Registered VCS PD of "8.35 MW wind power project at Guddarangavana Halli, District Chitradurga, State Karnataka in India" dated 2009-11-10
/FValR/	Final Validation report of project "8.35 MW wind power project at Guddarangavana Halli, District Chitradurga, State Karnataka in India" , dated 2009-11-12
/VVM/	Validation and Verification Manual (Version 1.2, EB 55)

Table 5-3: Websites used

Reference	Link	Organisation
/vcs/	www.v-c-s.org	VCSA
/cea/	http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm	Central Electricity Authority
/unfccc/	http://cdm.unfccc.int	UNFCCC
/kerc/	http://www.kerc.org/order2005/Order%20on%20NCE%20Tariff%20(FINAL).doc	Karnataka Electricity Regulatory Commission

Table 5-4: List of interviewed persons

Reference	MoI[1]		Name	Organisation / Function
/IM01/	V	☒ Mr. ☐ Ms	Ajeet Kumar	General Manager, MSPL Limited
/IM02/	V	☒ Mr. ☐ Ms.	Vivek Adhia	Consultant
/IM02/	V	☒ Mr. ☐ Ms.	Brij Mohan	Consultant

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