Title

15 MW Grid Connected Renewable Energy Wind Turbine Project in Karnataka

MONITORING REPORT

Ver. 03 – 20 September 2010
Period is chosen from 1st April 2006 to 31st December 2009 (inc. both days)
Reference: VCS 2007.1 .AMS ID VERSION13.

Net Emission Reductions: **108886 tCO2e**

Registered Office

Mineral Enterprises Ltd
300/1-B, 16th Cross,
SadashivNagar
Bangalore 560080

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1 Introduction

The project involves generation of 15 MW of electricity from installation of Wind Electric Generators (WEGs) across the Chtiradurga wind Corridor of Chitrdurga district in the state of Karnataka The project will harness the wind resource for electricity generation and will displace the electricity generated from the grid which comprises mainly the thermal generated energy mix resources,

The project is a group of project owned by a single owner Ms Mineral Enterprises Ltd Bangalore, in the wind regime of Chitradurga corridor, involving 20 WEGs, of 600 & 800 KW rated machines. The generated electricity shall be fed into the regional grid through the locally available evacuation facility provided by the state utility KPTCL, to the Southern Grid.

The purpose of this document is to report the emission reductions generated by the 15 MW wind power to grid Project during the following period (including the start and end days) 1st April 2006 to 31st December 2009.

2 Deviation from the VCS-PD

The HTSC/RR number of the 600 kW x 5 wind mill (phase I) is wrongly mentioned as VVS 26 in the VCS-PD. This is identified during the verification and the same has been corrected to VVS 28 in this monitoring report.

3 Reference

The project activity refers the UNFCCC approved small scale methodology “Grid connected Renewable Electricity Generation - AMS I.D.”, Version 13, Scope 1 (14 December 2007)

Project Description: 15 MW Grid Connected Renewable Energy Wind Turbine Project in Karnataka, version 04, dated 10 November 2009

4 Monitoring Period

The Monitoring period is chosen from 1st April 2006 to 31st December 2009 (inclusive of both days)

5 Definitions in the Report

CEA	:	Central Electricity Authority, Government of India.
GHG	:	Greenhouse Gases
IPCC	:	Intergovernmental Panel on Climate Changes

KPTCL	:	Karnataka Power Transportation corporation ltd
BESCOM	:	Bangalore Electricity supply company Ltd
MESCOM	:	Mangalore Electricity supply company ltd
PPA	:	Power purchase agreements
VCU	:	Voluntary Carbon Units
VCS	:	Voluntary Carbon Services
WEG	:	Wind Energy Generators
WTG	:	Wind Energy Turbines
kW	:	Kilo Watt
kWh	:	Kilo watt hour
MW	:	Mega Watt
MWh	:	Megawatt hour
EIL	:	Enercon India Ltd

6 General Description of the Project

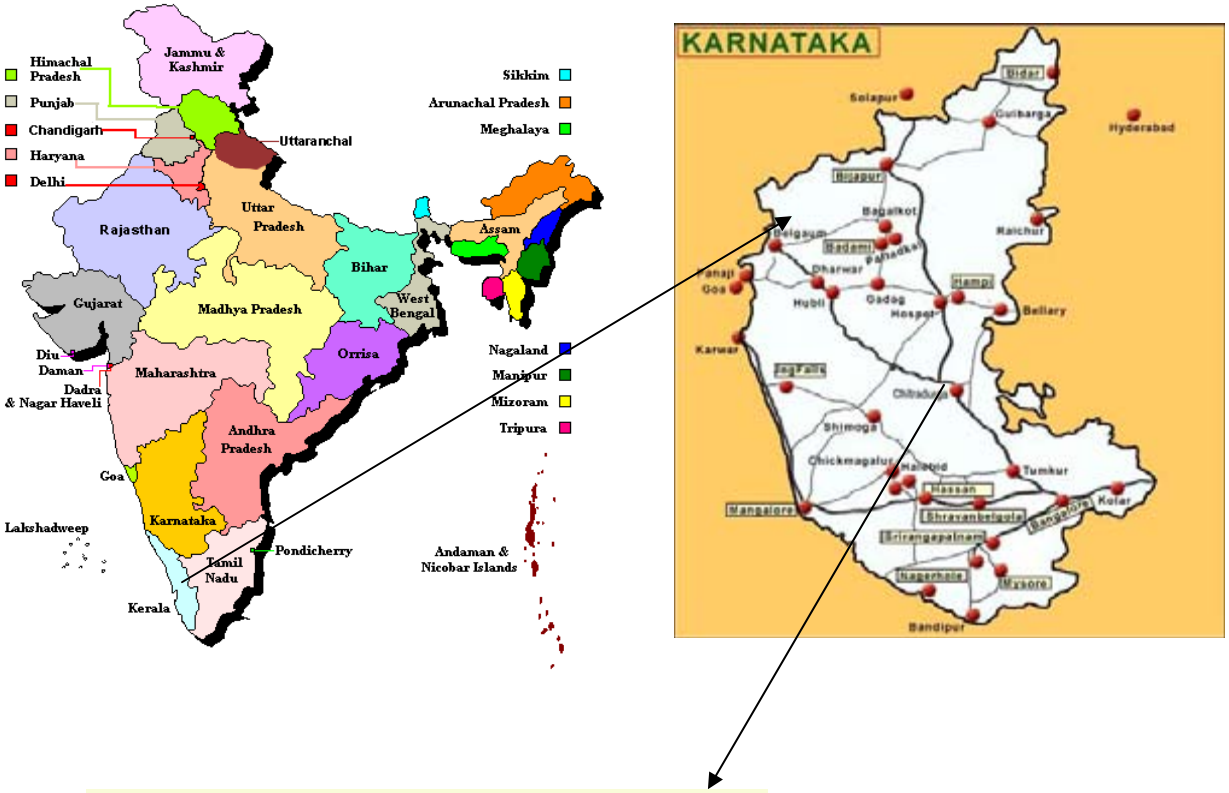
The proposed wind based power generation, is a small scale project activity with an installed capacity of15 MW (20 turbines consisting of 600kw x 5 Nos & 800kw x 15Nos) at Chtiradurga corridor, Chitradurga district Karnataka state, India.

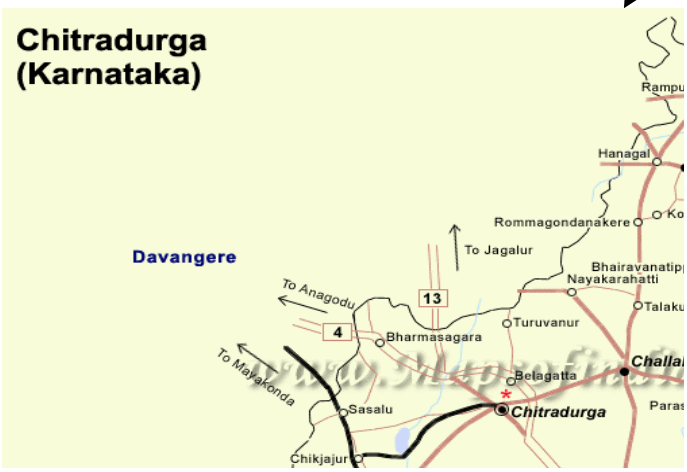
The technology envisaged for this project with wind turbines in two ratings of 600/800kw Wind Energy Generators (WEG) was developed by Ms. Enercon ltd. Installation of WEG's of 600 Kw x 5 & 800 Kw x 15Nos, was carried out in four different phases, commencing from 2004 , going on into 2005 & completed in 1st of April 2006 Details about commissioning of all WTGs have been given in below :

Project location

The Project activity is located in the Jogimatti Wind Zone at Chitradurga District in Karnataka, India. Chitradurga is approximately 200 km from Bangalore, the capital of Karnataka. It is located on the Bangalore–Mumbai highway, encompassing the sites of Vanivilasagar, Gim2 (West), Gim2 (Central) and MMCL. Specifically, they are located as detailed below in Hiriyur and Hosadurga talukas of Chitradurga district in Karnataka. The nearest railway station is at Chitradurga

The project is spread over the Talukas of Chitradurga wind corridor namely VVS, HDPura, & Kittadhall in the state of Karnataka. The longitude & latitude has been furnished is also furnished below





Identifications & Location of the Wind turbines:

Sl nos	Capacity KW	Date of com	HTSC/RRNo	Land Survey No	Village	Taluk	District	Longitude	latitude
1	600	30th Sept 2004	VVS28	101,4,1	Elladekere	vanivilassagar	Chitradurga	N13°51'21"	E76°29'33"
2	600	30th Sept 2004	VVS28	101,4,1	Elladekere	vanivilassagar	Chitradurga	N13°51'21"	E76°29'33"
3	600	30th Sept 2004	VVS28	101,4,1	Elladekere	vanivilassagar	Chitradurga	N13°51'21"	E76°29'33"
4	600	30th Sept 2004	VVS28	101,4,1	Elladekere	vanivilassagar	Chitradurga	N13°51'21"	E76°29'33"
5	600	30th Sept 2004	VVS28	101,4,1	Elladekere	vanivilassagar	Chitradurga	N13°51'21"	E76°29'33"
6	800	28thOct. 2005	MMCL05	14,21	Mathighatta &berebahalli	Holalkere	Chitradurga	N14° 05' 22"	E76° 01'25"
7	800	28thOct. 2005	MMCL05	14,21	Mathighatta &berebahalli	Holalkere	Chitradurga	N14° 05' 22"	E76° 01'25"
8	800	28thOct. 2005	MMCL05	14,21	Mathighatta &berebahalli	Holalkere	Chitradurga	N14° 05' 22"	E76° 01'25"
9	800	31st.Mar 2006	ELP39	142, 46	kitthadallhill	Hiriyur	Chitradurga	N13°56'46"	E76°25'10"
10	800	31st.Mar 2006	ELP39	142, 46	kitthadallhill	Hiriyur	Chitradurga	N13°56'46"	E76°25'10"
11	800	31st.Mar 2006	ELP39	142, 46	kitthadallhill	Hiriyur	Chitradurga	N13°56'46"	E76°25'10"
12	800	31st.Mar 2006	ELP39	142, 46	kitthadallhill	Hiriyur	Chitradurga	N13°56'46"	E76°25'10"
13	800	31st.Mar 2006	ELP39	142, 46	kitthadallhill	Hiriyur	Chitradurga	N13°56'46"	E76°25'10"
14	800	31st.Mar 2006	ELP39	142, 46	kitthadallhill	Hiriyur	Chitradurga	N13°56'46"	E76°25'10"
15	800	31st.Mar 2006	ELP39	142, 46	kitthadallhill	Hiriyur	Chitradurga	N13°56'46"	E76°25'10"
16	800	31st.Mar 2006	ELP20	46	kitthadallhill	Hiriyur	Chitradurga	N13°59'42"	E76°24'8"
17	800	31st.Mar 2006	ELP20	46	kitthadallhill	Hiriyur	Chitradurga	N13°59'42"	E76°24'8"
18	800	31st.Mar 2006	ELP20	46	kitthadallhill	Hiriyur	Chitradurga	N13°59'42"	E76°24'8"
19	800	31st.Mar 2006	ELP20	46	kitthadallhill	Hiriyur	Chitradurga	N13°59'42"	E76°24'8"
20	800	31st.Mar 2006	ELP20	46	kitthadallhill	Hiriyur	Chitradurga	N13°59'42"	E76°24'8"

Purpose of the project activity

The project activity involves the development and operation of wind based electricity generation facilities connected to the grid, with an aggregate installed capacity of 15MW located within the Enercon built wind turbine Wind Park.

The objective of the project activity is to construct, operate, maintain an aggregate wind power project, within the same wind park at Chitradurga in the Indian state of Karnataka for providing reliable, renewable power to the Karnataka Electrical Grid and reduce greenhouse gas emissions caused by reliance on fossil fuels. The project will lead to reduced greenhouse gas emissions because it will be displacing electricity from fossil fuel based electricity generating systems.

The electricity generated from this wind sites is supplied using internal electrical lines to a common local sub-station using local transmission lines.

The 15MW wind renewable energy electricity project activity is at Chitradurga corridor. The WEG are supplied installed, & maintained by Enercon, in the five different sites of same locations at Chitradurga wind corridor. The Enerocn maintained wind park comprises of 20 numbers of Enercon-make wind converters, with each machine having a capacity of 600KW to 800KW. Enercon (India) Ltd (EIL) is the turbine supplier and is also, the operations and maintenance contractor. The generated electricity is being supplied to southern grid under long-term power purchase agreement (PPA).The purpose of the project is to harness renewable resources in the region, and thereby displacing non renewable natural resources, thereby ultimately leading to sustainable economic and environmental development. The project activity includes development, design, engineering, procurement, finance, construction, operation and maintenance of wind energy based electric generating stations supplying electricity to the southern grid.

The project is promoted by Mineral Enterprises Limited, a company engaged in the mining industry in India, in the state of Karnataka, of which one mine is located in the same district as the project, i.e. in Chitradurga. The project began in May 2004 with the issue of the purchase order by the project promoter and implementation was completed by March, 2006 when the last WEG was installed.

7 Details of Major Equipment of the Project & Plant shut downs for the Reported Period.

The project proponent has selected the Enercon make gearless technology, which features a synchronous generator suitable for variable speed options .(Please refer Enercon manufacturers website www.enercon.de) .This enables power generation at very low speeds, which has the potential to improve power generation from any particular site, and therefore improve the potential of wind power in the country. Thus, in addition to being technologically superior, it also is resource efficient. For the proposed project, the project employs 600 kW (E-40) and 800 kW (E-48) turbines of Enercon make for power generation. Enercon has introduced synchronous generator (SG) in place of induction type generators usually used with gears; the generator is used with a high frequency inverter for operating even under variable wind speeds.

Details of Major Equipment of the Project

The operational specifications and rated outputs for models, E 40/E44 & E48.There are 600kw & 800KKw machines, of 5 numbers & 12 numbers, built in 4 phases, located at four different places in the same district of Chtradurga. The technology particulars are furnished here below:

Details of Major Equipment of the Project and Suppliers of a project

Phases	Capacity	WEG x Number of Machines	List of major equipments

Phase-1	3 MW	600kw x 5	• Wind energy converters- Enercon India make 600kw,400v, Synchronous generators-5Nos • Transformers of: 700KVA, 400V/33KV. 1.2.25/1010A-2nos • CTPT combined for 33kv metering, with electronic tri - vector meters 2units • .33KVOH line with rabbit conductors,
Phase-2	2.4MW	800KWX3	• Wind energy converters- Enercon India make 800kw,400v, Synchronous generators • 900 KVA, Transformers 400v/33kv 2Nos • CT 33KV • PT33KV/110V • Trivector meters 2nos • Group controlled SF_6 Circuit breakers 36kv. • 33KV OH line 550mtrswiht ACSR coyote conductor
Phase-3.1	5.6 MW	800Kw x 7 Nos	• Wind energy converters- Enercon India make 800kw,400v, Synchronous generators • 950 KVA, Transformers 400v/33kv 2Nos • CT 33KV • PT33KV/110V • Trivector meters 2nos • VCB breakers 36kv. • 33KV Intra form line 2200 mtrs with ACSR conductor
Phase 3.2	4 MW	800Kw x 5 Nos	• Wind energy converters- Enercon India make 800kw,400v, Synchronous generators • 950 KVA, Transformers 400v/33kv 2Nos • CT 33KV • PT33KV/110V • Trivector meters 2nos • VCB breakers 36kv. • 33KV Intra form line 2200 mtrs with ACSR conductor

Plant shut downs for the Reported Period.

Project performance: Ms. Enercon's technology has a built-in preventive maintenance, which has not lead to any major break downs of wind turbines from the date of Installation till date. The records & approach of their scheduled maintenance is furnished in the Annexure 1

Firstly, the project started operations in May 2006 with only one turbine operating; Turbines 2 and 3 became operational in July after which the project became fully operational. Project performance in the first few months of operation was therefore limited. Secondly, the project's capability to supply power has been curtailed due to the limited transmission capacity of the local grid. In recent years power generation capacity

in the local area has rapidly expanded but not all generated power can be transmitted by the grid. This affects the project's ability to supply power to the grid as the grid company occasionally requests the project to limit the generation load or halt power supply to the grid. During the monitoring period there have been no occurrences of emergencies.

8 Statement to what extent the Project has been implemented as Planned

The WEGs included in the project have already been commissioned and the monitoring equipments are installed to monitor the parameters as described in the Project Document (PD). The commissioning dates are presented in section 5 of this report.

9 Sustainability – Economic and Social Well Being

The project will result in sustainable development in the region as follows:

- The wind installations are carried out depending upon the wind potential of the site and thus may not be implemented close to load centers. This results in the scattered implementation of wind projects thereby resulting in strengthening of local feeders and rural grids which in turn increases the availability of electricity in the nearby villages / suburban areas.

- Implementation of the project will also contribute towards meeting the electricity deficit in the Karnataka state KPTCL/Southern regional grid

- Implementation of the project has helped in developing the local economy and will help in creating employment opportunities for the local skilled & semi skilled people.

- The project essentially uses the available wind potential at the site which is converted into electricity; the operation of this facility is in tandem with environment, as there are no emissions from the project.

10 Parameters being monitored according to Monitoring Plan

All the monitoring parameters are monitored as mentioned in the PDD

Data and parameters monitored / selecting relevant GHG sources

Data / Parameter:	EGy
Data unit:	KWh
Description:	Net Electricity supplied to the grid by the WEGs

Source of data to be used:	B-Form from BESCOM providing the monthly electricity generated from project activity and uploaded to Southern grid
Value of data applied for the purpose of calculating expected emission reductions	117475077.8
Description of measurement methods and procedures to be applied:	Net electricity supplied to grid will be calculated based on the measured values of “export” and “import” on the main meter, where joint reading is taken by project proponent representative and BESCOM officials. BESCOM will calculate the transmission loss. The net electricity supplied to grid will is calculated based on the formula Net electricity supplied to grid = export-115% of import-transmission loss All the details are provided in the B-Forms in the respective months. The maximum error is applied to find the electricity for the months the calibration validity is not there.
QA/QC procedures to be applied:	The net energy exported value shall be cross checked with the monthly invoice raised to BESCOM by Mineral Enterprise Limited. Calibration of the energy meters being used will be carried out annually as per the standard practice. But in actual the calibration was done in the mentioned frequency. Hence the maximum allowable error 0.2% applied for both export & import electricity to calculate the net electricity exported All the B-Forms and invoice certificates shall be archived for the entire crediting period plus two years. All these activities shall be carried out by trained personnel of Enercon Wind Technology that is an ISO 9001 certified company. Thus, all QA / QC procedures applicable shall be followed. The data records shall also be maintained as specified in the quality standard.
Any comment:	The accuracy class of the metering equipment shall be 0.2% (both main and check meters) as also mentioned in the Power Purchase Agreement.

Information Used for Emission Reduction Calculations

Sr. No.	Key information/data used for baseline	Source of data/information
1.	Net Electricity Exported to grid	B-Forms given by BESCOM/KPTCL
2.	Baseline Emission Factor	CEA Database version 04

11 Monitoring plan

The main objective of having a monitoring system is to have a constant check on the emission reductions. Energy delivered by the project as recorded in the Main Meter is the relevant data to monitor to keep a constant check on the emissions reductions achieved by the project.

Project proponents in co-ordination with BESCOM or its representative Energy Distribution Companies meter the delivered energy. The project activity is supplying electricity at 33 kV through double circuit overhead transmission (suspension type) conductors to Method 66/11KV substation (from Phase 1), Horakeredevarapura 66/11KV substation (from Phase 2) and Hiriyur 220/66/11KV substation (Phase 3.1). &phase 3.2

The general conditions set out for metering, recording, meter readings, meter inspections, Test & Checking and communication shall be as per the PPA (power purchase agreement) with BESCOM.

The project activity generates about 15MW equivalent of clean electricity, with efficient utilization of the available wind energy, with Enercon turbines, The project activity displaces energy (largely from fossil fuel based sources),and also delays any planned expansion ,of the grid generations by its equivalent size ,which contributes to sustainable development and conservation through use of wind ,a renewable resource ,of green energy of MU units, per Annum , is fed to the Southern grid. The project is promoted by Mineral Enterprises Limited, a company engaged in the mining industry in India, with at least 5 mines in the state of Karnataka, of which one is located in the same district as the project, i.e. Chitradurga. The project began in May 2004 with the issue of the purchase order by the project promoter and implementation was completed by March, 2006 when the last WEG was installed.

Mineral Enterprises Limited has entered into power generation and sale of power to the grid in the Indian state of Karnataka, through introduction and application of wind power technology. In the current global scenario, investment in renewable energy such as wind power is considered environmentally desirable and socially acceptable.

The project activity of MEL is solely owned by them through subleasing argument from Ms Enercon, who maintains the wind energy sites, as the wind turbines haven been manufactured by Ms Enercon using the technology of which the details have already been covered.

Methods of data transfer and archiving policy

The meters used for recording the electricity generation will be of integrator type. The electricity generated will be recorded on a daily basis. The data will be captured and stored electronically, wherever possible. As a separate measure, the same data will be entered in the log book on change of every shift. The monitoring data shall also be archived by Enercon (India) Limited as a backup arrangement for the entire crediting period plus two years.

Measuring instruments of all the parameters covered under the monitoring plan which are required to be monitored regularly will be calibrated as per maintenance schedule.

On the last day in the last week of every month, readings are taken from the Main meter at the MRS on the basis of which invoices are raised to the BESCOM. The annual emission reductions have been calculated based on these joint meter readings. A double check of the measurements can be done with the help of the sale receipts from the BESCOM.100% of the relevant data from the project is monitored i.e. all data related to the monthly electricitygeneration1 by the project is regularly observed and collected by the project proponent.

The data archived will be archived for 2 years after the end of the crediting period. The monitoring procedure, data transfer and archiving procedures is described in the paragraphs below:

The general conditions set out for metering, recording, meter readings, meter inspections, Test & Checking and communication are as per the PPA signed with BESCOM/ MESCOM/KERC/KPTCL, as the Enercon & MMCL ,are the contractors, who maintain the sites , However The paragraphs below present the procedure adopted by them.

Metering procedure adopted by ENERCON/BESCOM - WEG type: E40 /E48 for 600 KW/800KW as per PPA is furnished below:

Every WEG has one meter (of 0.2% accuracy class) attached to the respective WEG(s) which in turn is connected to the feeders. The feeders are connected to 66 KV substations. The group meters are tri-vector meters of 0.2% class accuracy and are used at arriving the daily/monthly generation by WEG or group of WEGs as the case may be.

Metering procedure adopted by ENERCON:

All the WEGs managed by Enercon Ltd. are connected to the respective feeders which are connected at the substation. Every WEG is connected to the feeder with a tri-vector meter of 0.2%class accuracy. The reading of individual WEG meter is used for arriving at the monthly generation of the respective WEG.

Meter Test checking for all the WEGs

The meter is tested for accuracy annually with reference to a portable standard meter which is of an accuracy class of 0.2%. The portable standard meter is owned by the KPTCL at its own cost and tested and certified from an accepted laboratory standard meter in accordance with electricity standards. The meters are deemed to be working satisfactorily if the errors are within specifications i.e. ± 0.2 %. The consumption registered by the meter will hold well for the purpose of billing as long as the error in the main meter is within the permissible limits. In case meter is not calibrated once in a year the error shall be applicable to the energy generation as per EB 52 Annex 60.

Meter Readings: The monthly meter reading will be taken during the last week of the month, and the last day of every month at the 33 kV end of the wind energy substation carrying main meters (tri-vectors) of 0.2s class accuracy. These main meters also account for the import of electricity from the grid. Meter readings are taken jointly at the appointed date and the readings are written in the B-Form and the same will be signed by the representatives of KPTCL/ENERCON /MEL, and the power producer. If power producer's representative is not available, then KPTCL shall provide the power producer with a signed copy of the meter reading of the main metering system or the backup metering system as the case may be. Such meter readings shall be treated as the accurate and final measurement of the energy supplied to MEL by the power producer for preceding month for the period of payment. Full details are available in the documents submitted during pre validation stage for all the four phases in the 3 books.

The lines from the Substation are further connected to 66kv receiving stations& is as furnished below which is connected to the respective grids, (for reference purpose only.) At the receiving end of the Substation, there are two tri-vector meters of 0.2% class accuracy, installed to check the transmission losses between the wind turbine plant Substation and Main receiving substations and can be used as a Check Meter in case of failure of Main Meters installed.. The total transmission losses are losses between the WEG meters and the meters installed at 33 kV end of the 33kv Substation. (This is available in the field report)

Phases	MW	Generation voltage	Survey Nos	Stepped upto kv	Substation voltage level	KVA of transformer	Connected to main receiving station & to grid
Phase1	3.0	400V	101,4,1	33 KV	66 KV	2x31.5 MVA	Mathod Sub Stn.
Phase2	2.4	400V	14,21	33 KV	66 KV	12.5 MVA	H.D. Pura
phase3.1 GIM 2 (Central)	5.6	400V		33 KV	66 KV	2 x40 MVA	220 KV SRS Sub Stn
phase3.2 GIM 2 (West)	4.0	400V	46	33KV	66 KV	2 x40 MVA	220 KV SRS Sub Stn.

QA/QC Measures in Monitoring

The following points summarize the QA/QC procedures that are being followed at the site. The electricity generated is metered with the help of electronic meters located at the Receiving station.

There are two electronic meters located at both the MRS (1&2):

1) Main meter and 2) Check meter. The check meter is used as back up for the meter reading in case of malfunctioning of the main meter.

Both the meters are calibrated periodically (but once in at least three years) by the BESCOM to ensure accuracy. All meters are of Accuracy class 0.2 %.

The meter reading/testing/calibration procedures are in accordance & are highlighted in the respective PPA, the details are furnished in the clause 6, in the documentation submitted to you before pre validation

The meters are calibrated in the following dates

	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			

Since the meters are not calibrated once in a year, as per EB 52 Annex 60 the maximum permissible error is applied to both the electricity export to grid and import from grid for the calculation of net electricity supplied to grid.

Monitoring roles and responsibilities:
The sole parameter for monitoring is the electricity supplied to the grid. The project proponent has entrusted the operations and maintenance of the project to Enercon India, since they themselves lack the technical expertise to do so. Enercon India, the technology supplier, is an ISO 9000 company and has elaborate Procedures and well trained staff to carry out the various functions to ensure that the project delivers energy as planned and that the data is duly recorded and communicated to the Project Proponent on a regular basis.

The project activity will be looked after by the manager responsible for operation of the wind energy generating machines at the project site. Daily operations of the wind energy generating machines will be carried out by the staff responsible for the operation of the WEGs.

The meters used for recording the electricity generation will be of integrator type. The electricity generated will be recorded on a daily basis. The data will be captured and stored electronically, wherever possible. As a separate measure, the same data will be entered in the log book on change of every shift. The monitoring data shall also be

archived by Enercon (India) Limited as a backup arrangement for the entire crediting period plus two years.

Measuring instruments of all the parameters covered under the monitoring plan which are required to be monitored regularly will be calibrated as per maintenance schedule.

Monitoring Methodology:
The monitoring of VERs generated by the project follows the same principals that have been adopted for the monitoring of emission reductions under the Clean Development Mechanism. The project design document which has been registered for the project activity applies the following simplified monitoring methodology (hereafter referred to as AMS-I.D):

12 GHG Calculations

The following formula is adopted for calculating emission reductions generated by the project:The emission reductions for a given year are baseline emissions minus the project emissions and leakage.

$$ER_y = BE_y - PE_y - L_y$$

Where

ER_y = Emission reductions in a given year
BE_y = Baseline emissions in a given year
PE_y = Project emissions in a given year
L_y = Leakage in a given year

Baseline Emissions
The baseline emissions are calculated as follows:

$$BE_y = EG_y \cdot EF_y$$

Where EG_y = Net electricity export to grid in a given year (GWh)
EF_y is = Emission factor for a given year (tCO_2/GWh)

As mentioned in the PD, the project has considered the ex-ante emission factor for the combined margin of the southern regional grid and the details are furnished below:

$W_{OM} = 0.75$
$W_{BM} = 0.25$

Baseline emission Factor (EF_{BL}) Or Combined margin is calculated as weighted average of simple Operating Margin and build Margin emission Factors. Therefore,
$EF_{BL} = (0.75 \text{ X } EF_{OM}) + (0.25 \text{ X } EF_{BM}) = 0.9269$ tCO2equivalent / MWh
The emission factor for simple operating margin (EF_{OM}) can be calculated as the average of ex ante data vintage on the basis of methodological tool (EB35, Annex-12) to calculate emission factor for an electricity system.

Thus the three years (2005-06; 2006-07; 2007-08) weighted average data of simple operating margin has been calculated and arrived as 0.9981 t CO2/MWh:

The Build Margin (EF_{BM}) for the year 2007-08, applicable for the project is 0.7133 tCO2/MWh from the CEA database

Using the values of emission factors for OM and emission factor for BM, provided in the official database and the weights provided above the value of the emission factor for the combined margin has been determined to be 0.9269 tCO2equivalent / MWh. Thus the emission factor considered is 0.9269 t CO2e/MWh, calculated by applying a weight of 75% to the Simple Operating Margin and 25% to the Build Margin for the Southern grid. In order to determine GHG mitigation in a conservative manner, no transmission and distribution losses have been considered. In order to determine the emission in a baseline scenario, the emission factor is multiplied by the net power generated by the wind energy generators. The project emission in the proposed CDM project has been taken as zero t CO2e/MWh, as wind is a zero GHG emitting renewable form of energy.

Project emissions (PEy):
The project emissions are considered zero.

Leakage
As specified in AMS ID Version 13 project participants do not need to consider these emission sources as leakage in applying this methodology. Hence the leakage emissions are considered zero. Using the above formulas, the Emission reductions from the project are shown below.

Period Generation (Mwh) Emission reductions Details of the generation from the project activity have been given in Annexure Details of monthly generation and emission reductions have been given in Annexure

The project category applicable to the proposed project is AMS ID. Accordingly, the energy baseline being considered is as directed in paragraph 9 of the AMS.I.D/Version 13, that provides that the applicable baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kg CO2e/kWh) calculated in a transparent and conservative manner as ,is explained above :

A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the 'Tool to calculate the emission factor for an electricity system'.
OR
(b) The weighted average emissions (in kg CO2e/kWh) of the current generation mix. The data of the year in which project generation occurs must be used.

The methodology also states that the calculations must be based on data from an official source (where available) and made publicly available.

EFy = Baseline Emissions Factor in tCO2/MWh (from the official database published by the CEA, Version 4.0, October 2008)

EGy = Net electricity supplied by the project activity to the grid in MWh
EGy = 15000 x 26.5% x 8760
= 34821000 KWh
= 34821 MWh
Thus, BEy = 34821 MWh x 0.9269 tCO2/MWh
= 32275 tCO2 estimated values as per final VCSPD

13 Net Emission Reductions

The energy exported by the project is recorded from main meter installed at the substation. The accuracy clause of both the meters is 0.2 %. As per validated PD the calibration of main & check meters needs to be done once in a year. But the meters are not calibration in the mentioned frequency. The calibration is not in the purview of PP's hand. As mentioned in the PDD the calibration will be done by KPTCL depends on the availability of KPTCL staff.

Since the calibration is not done once in a year, the energy exported to grid and imported from grid are adjusted to maximum allowable error of 0.2% for the months where the calibration validity is not there. As per EB 52 Annex 60 guidance, the export energy readings are reduced 0.2% and the import energy readings are increased 0.2%

So the net electricity exported to grid are calculated as follows

Net electricity exported = Adjusted export – 115% Adjusted import – transmission loss

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

The net electricity exported to grid in the reported monitoring period is 117475.1 MWh

The emission reduction is calculated by multiplying the net electricity exported by grid emission factor which was fixed as 0.9269tCO_2/MWh in the validated PD. The total emission reduction achieved in the reported mentoring period is 108886 tCO_2

Energy data and emission reduction data for each month in the monitoring period is mentioned in the emission reduction excel sheet. The summary of Net electricity exported and emission reduction are mentioned below.

Year	Net electricity exported in kWh				Total net electricity exported in MWh	Emission factor (tCO2/MWh)	Emission reduction (tCO2)
	MMCL05	ELP39	VVS28	ELP20			
2006	5970691	8707256	5533396	7415369	27626.7	0.9269	25607
2007	6241665	9698186	5845524	8559173	30344.5	0.9269	28126
2008	6210705	9827221	5710419	8323572	30071.9	0.9269	27873

2009	5911186	9752205	5777046	7991465	29431.9	0.9269	27280
Total	**24334247**	**37984868**	**22866384**	**32289579**	**117475.1**		**108886**

14 Contact information of Project Participant as per VCS PD

Contact information on participants in the project activity Organization:	**Mineral Enterprises Ltd.**
Street/P.O.Box:	**#300/1-B, 16th Cross, Sadashivanagar,**
Building:	
City:	**Bangalore**
State/Region:	**Karnataka**
Postfix/ZIP:	**560 080**
Country:	**India**
Telephone:	**+91-80-23612569, 23613182, 23619939**
FAX:	**+91-080-23612737**
E-Mail:	**minent@blr.vsnl.net.in**
URL:	**www.mineralenterprise.com**
Represented by:	**Mr. Basant Poddar**
Title:	**Managing Director**
Salutation:	**Mr.**
Last Name:	**Poddar**
Middle Name:	**---**
First Name:	**Basant**
Department:	**Mr N.B Sanjay, General Manager, (Environment), MEL)**

Prepared by

Consulting Engineers:
Prabhakar & Vijaya prabhakar
Vijayaillu,
6th Main l07,8th cross, Malleshwaram, Bangalore 560003
Ph:91-080-41281943

Annexure 1- Letter from Ms Enercon India Ltd informing no break downs.

ENERCON
INDIA

ISO 9001 : 2000

EIL/MEL/ 003
21st January 2010

To,
Mr. Raghavan
Mineral Enterprises Ltd.,
300/1B, 16th Cross,
Sadashivnagar,
Bangalore – 560 080
Ph: 080- 2361 2569

Dear Mr Raghavan,

Sub: - **Maintenance for your WEGs in Karnataka**

This is to inform you that there is no **major breakdown occurred so far** in your machines which are installed at Karnataka (sites-VVS, GIM-2 West, GIM-2 Central and HD Pura)

Preventive maintenance practices which are being followed at EIL is annexured herewith for your reference.

Kindly acknowledge the receipt of the above document.

Thanking you.

Yours faithfully
For **ENERCON (INDIA) LTD**

Narendra Somoshi
Deputy General Manager -Service

ENERCON (INDIA) LIMITED
✓ **Corporate Office :** Enercon Tower, A-9, Veera Industrial Estate, Veera Desai Road, Andheri (West), Mumbai - 400 053.
Phone : 91-22-66924848 **Fax :** 91-22-67040473
Regd. Office & Plant : Plot No. 33, Daman Patalia Road, Bhimpore, Daman - 396 210. India.
Phone : 0260 / 2220624 + 2220628 Fax : 0260-2221508

Annexure 2- Letter from Enercon –Quarterly calibration of energy meters of various wind projects in Chitradurga district / Reports of calibration/Methods

Kind Attn – Mr. Ashish

ENERCON

No.: EIL/CTA/ASI/2009-71

Date: 20th October 2009

To

The Executive Engineer (Ele),
NCE Division,
BESCOM,
Chitradurga – 577501.

Dear Sir,

Sub: Quarterly Calibration of energy meters of various wind power projects in Chitradurga Dist. maintained by us.

Dear Sir,

As you are aware, the calibration of main and check meters of various wind power projects are being done once in a year. However, as per the PPA signed with KPTCL / BESCOM, it is required to calibrate both main and check meters of the wind power projects every quarter.

In view of the above, we request you to kindly arrange to calibrate both main and check meters of the various wind power projects as per Annexure.

Kindly do needful at the earliest.

Thanking you,

Yours faithfully,
For **Enercon (India) Ltd,**

(Srikantha KS)
ASI, Chitradurga.

Encl: As above.

Received
Executive Engineer
22/10/09
ರವಾನೆ ಸಂಖ್ಯೆ
ಬೆಸ್ಕಾಂ, ಚಿತ್ರದುರ್ಗ ವಲಯ,
ಚಿತ್ರದುರ್ಗ

ENERCON (INDIA) LIMITED
Chitradurga Office: Ganesh Towers, Turuvanur Road, Chitradurga – 577501
Ph 08194 231628, Fax 08194 231629
Bangalore Office: 3rd Floor, Casa Birgitta, No 10, Brunton Road, Bangalore – 560025
Ph 080 40428000, Fax 080 40428280
Corporate Office: Enercon Tower, A/9, Veera Industrial Estate, Veera Desai Road, Andheri (W), Mumbai – 400053
Ph 022 66924848 Fax 022 67040463 Website www.enerconindia.net