

MONITORING REPORT FORM (CDM-MR) *
Version 01 - in effect as of: 28/09/2010

CONTENTS

- A. General description of the project activity
 - A.1. Brief description of the project activity
 - A.2. Project participants
 - A.3. Location of the project activity
 - A.4. Technical description of the project
 - A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity
 - A.6. Registration date of the project activity
 - A.7. Crediting period of the project activity and related information
 - A.8. Name of responsible person(s)/entity(ies)
- B. Implementation of the project activity
 - B.1. Implementation status of the project activity
 - B.2. Revision of the monitoring plan
 - B.3. Request for deviation applied to this monitoring period
 - B.4. Notification or request of approval of changes
- C. Description of the monitoring system
- D. Data and parameters monitored
 - D.1. Data and parameters used to calculate baseline emissions
 - D.2. Data and parameters used to calculate project emissions
 - D.3. Data and parameters used to calculate leakage emissions
 - D.4. Other relevant data and parameters
- E. Emission reductions calculation
 - E.1. Baseline emissions calculation
 - E.2. Project emissions calculation
 - E.3. Leakage calculation
 - E.4. Emission reductions calculation
 - E.5. Comparison of actual emission reductions with estimates in the registered CDM-PDD
 - E.6. Remarks on difference from estimated value

* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).

MONITORING REPORT

Version 01.0 09/10/2011

Title: GEI WIND POWER PROJECT IN KARNATAKA, INDIA

UNFCCC Reference No: 4144

Monitoring Period Number: 01

and

Monitoring Period: From 01/04/2011 to 30/09/2011 (Including first and last day)

SECTION A. General description of the project activity

A.1. Brief description of the project activity: >>

>>

1. Purpose of the project activity and the measures taken to reduce greenhouse gas emissions:

The project activity is the successful installation and generation of 31.2 MW through efficient utilization of renewable energy source viz., wind energy at Harthi, Kurtakoti and Malasamudra villages of Gadag district in Karnataka in order to generate electricity to be fed to Southern grid.

The purpose of the project activity is to utilize renewable wind energy for generation of electricity. The project activity replaces anthropogenic emissions of greenhouse gases (GHG's) into the atmosphere, by displacing the equivalent amount of electricity generation through the operation of existing fuel mix in the grid comprising mainly fossil fuel based power plants and future capacity expansions connected to the grid.

In the absence of the project activity the equivalent amount of electricity would have been generated from the connected/ new power plants in the Southern grid, which are/ will be predominantly based on fossil fuels. Whereas the electricity generation from operation of WECs is emission free. As per the applicable methodology the baseline scenario for the project activity is the grid based electricity system, which is also the pre-project scenario.

39 numbers of Wind Energy Generators (WEGs) are installed for power generation which are E-53 of Enercon make having installed capacity of 800 kW.

2. Brief description of the installed technology and equipments:

The Project activity involves 39 WECs of Enercon make (800 kW E-53) with internal electrical lines connecting the Project with local evacuation facility. The WECs generates 3-phase power at 400V, which is stepped up to 33 KV at the Project site and further stepped up to 220 KV at the Receiving sub station at Nagavi village, Gadag in the close vicinity of the existing 220 KV DC line between Hubli and Lingapur by line-in – line-out (LILO) of both 220 KV circuits, for the purpose of interconnection with the KPTCL/HESCOM grid at the sub-station of the KPTCL/HESCOM. The Project can operate in the frequency range of 47.5–51.5 Hz and in the voltage range of 400 V \pm 12.5%. The life time of the WEC is 20 years as provided by the equipment supplier.

The Project can operate in the frequency range of 47.5–51.5 Hz and in the voltage range of 400 V \pm 12.5%. The life time of the WEC is 20 years as provided by the equipment supplier. The other salient features of the state-of-art-technology are:

E-53 Specifications

Turbine model	Enercon E- 53
Rated power	800 KW
Rotor diameter	52.9 m
Hub height	75 m (Concrete)
Turbine Type	Direct driven, horizontal axis wind turbine with variable rotor speed
Power regulation	Independent pitch system for each blade.
Cut in wind speed	2.5 m/s
Rated wind speed	12 m/s
Cut out Wind speed	28-34 m/s
Extreme Wind Speed	59.5 m/s
Rated rotational speed	29 rpm
Operating range rot. speed	12-29 rpm
Orientation	Upwind
No of Blades	3
Blade Material	Fibre Glass Epoxy reinforced.
Gear box type	Gear less
Generator type	Synchronous generator
Braking	Aerodynamic
Output Voltage	400 V
Yaw System	Active yawing with 4 electric yaw drives with brake motor.
Tower	74 m (Concrete)

3. Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods, etc.).

The commissioning dates of all the WTGs installed in the project activity have been provided in the table below:

Sl. No.	Location No.	No. of WTGs	Commissioning Date	Village
1	170a	4	17.12.2007.	Harthi
2	170			
3	171			
4	236			
5	229	6	17.03.2008.	Malasamudra
6	181			
7	180			
8	163			Kurthkoti
9	226			Malasamudra
10	230			
11	173	8	25.06.2008.	Harthi
12	231			Malasamudra
13	174			Harthi
14	233			
15	232			
16	234			
17	169A			

18	237			
19	168	10	07.07.2008.	Kurthkoti
20	169			Harthi
21	235			
22	136			
23	137			
24	138			
25	139			
26	140			
27	141			
28	179			Malasamudra
29	228	4	11.09.2008.	Malasamudra
30	172			Harthi
31	227			Malasamudra
32	239			Harthi
33	167	4	29.09.2008.	Kurthkoti
34	176			Harthi
35	178			Kurthkoti

36	164			Kurthkoti
37	165	3	10.10.2008.	Kurthkoti
38	166			Kurthkoti
39	177			Malasamudra
Total		39		

4. Total emission reductions achieved in this monitoring period:

Generation (April 2011 to September 2011) kWh	Baseline (tCO₂/MWh)	Emission Reduction (tCO₂)
37,984,218	0.92694	35,209

A.2. Project Participants

>>

Generacion Eolica India Limited (Henceforth “GEI”)

A.3. Location of the project activity:

>>

The Project is located at Harthi, Kurtakoti & Malasamudra villages in Gadag district of Karnataka state in India. The GPS coordinates are provided in the following table:

Sl. No.	Location No.	No. of WTGs	Village	Longitude	Latitude
1	170a	4	Harthi	15°20’53”	75°34’29.2”
2	170			15°20’59”	75°34’27.5”
3	171			15°21’5.8”	75°34’26.1”
4	236			15°21’14.3”	75°34’38.8”
5	229	6	Malasamudra	15°21’59.9”	75°34’23”

6	181			15°22'16.6"	75°33'57.8"
7	180			15°22'10.4"	75°34'0.9"
8	163		Kurthkoti	15°22'8.3"	75°33'44.8"
9	226		Malasamudra	15°22'19.2"	75°34'13.5"
10	230			15°21'52.7"	75°34'23.9"
11	173	8	Harthi	15°21'19.4"	75°34'19.9"
12	231		Malasamudra	15°21'46.8"	75°34'27.4"
13	174		Harthi	15°21'31.5"	75°34'15.5"
14	233			15°21'33.3"	75°34'30.6"
15	232			15°21'39.6"	75°34'28.6"
16	234			15°21'27.8"	75°34'33.5"
17	169A			15°21'20"	75°34'3.7"
18	237			15°21'8.1"	75°34'41.3"
19	168	10	Kurthkoti	15°21'35.7"	75°33'56.8"
20	169		Harthi	15°21'29.5'	75°34'1.5"
21	235			15°21'21.3"	75°34'39.2"

22	136			15°20'26.5"	75°34'5.7"
23	137			15°20'32.6"	75°34'4.6"
24	138			15°20'39.9"	75°34'4.9"
25	139			15°20'44.8"	75°33'57.3"
26	140			15°20'50.9"	75°33'57.3"
27	141			15°20'59.2"	75°33'56.9"
28	179	4	Malasamudra	15°22'3.6"	75°34'2.6"
29	228		Malasamudra	15°22'6.2"	75°34'18.1"
30	172		Harthi	15°21'11"	75°34'22.3"
31	227		Malasamudra	15°22'15.2"	75°34'25.2"
32	239	4	Harthi	15°20'52.8"	75°34'41.2"
33	167		Kurthkoti	15°21'42.8"	75°33'54.3"
34	176		Harthi	15°21'44.5"	75°34'9.5"

35	178		Kurthkoti	15°21'58.1"	75°34'5.6"
36	164		Kurthkoti	15°22'2.8"	75°33'48.1"
37	165	3	Kurthkoti	15°21'55.3"	75°33'50.5"
38	166		Kurthkoti	15°21'49.3"	75°33'51.3"
39	177		Malasamudra	15°21'51.4"	75°34'8.1"
Total		39			

A.4. Technical description of the project

>>

The Project activity involves 39 WECs of Enercon make (800 kW E-53) with internal electrical lines connecting the Project with local evacuation facility. The WECs generates 3-phase power at 400V, which is stepped up to 33 KV at the Project site and further stepped up to 220 KV at the Receiving sub station at Nagavi village, Gadag in the close vicinity of the existing 220 KV DC line between Hubli and Lingapur by line in line out (LILO) of both 220 KV circuits, for the purpose of interconnection with the KPTCL/HESCOM grid at the sub-station of the KPTCL/HESCOM.

The Project can operate in the frequency range of 47.5-51.5 Hz and in the voltage range of 400 V \pm 12.5%. The life time of the WEC is 20 years as provided by the equipment supplier. The other salient features of the state-of-art-technology are:

- Gearless Construction - Rotor & Generator Mounted on same shaft eliminating th Gearbox.
- Variable speed function – has the speed range of 18 to 33 RPM thereby ensuring o timum
- efficiency at all times.
- Variable Pitch functions ensuring maximum energy capture.
- Near Unity Power Factor at all times.
- Minimum drawl (less than 1% of kWh generated) of Reactive Power from the grid.
- No voltage peaks at any time.
- Operating range of the WEC with voltage fluctuation of -20 to +20%.
- Less Wear & Tear since the system eliminates mechanical brake, which are not needed due to low
- speed generator which runs at maximum speed of 33 rpm uses Air Brakes.
- Three Independent Braking Systems.
- Generator achieving rated output at only 33 rpm.
- Incorporates lightning protection system, which includes blades.
- Starts Generation of power at wind speed of 3 m/s.

Enercon (India) Limited has secured and facilitated the technology transfer for wind based renewable energy generation from Enercon GmbH, has established a manufacturing plant at Daman in India, where along with other components the "Synchronous Generators" using "Vacuum Impregnation" technology are manufactured.

A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity:

>>

Title: Consolidated baseline and monitoring methodology for "Grid -connected electricity generation renewable sources" Reference: Approved consolidated baseline methodology ACM0002 (Version 11, EB 52)

ACM0002 draws upon the following tools which have been used for ex-ante Emission Reduction calculation:

- Tool to calculate the emission factor for an electricity system - Version 02, EB 50
- Tool for the demonstration and assessment of additionality - Version 05.2, EB 39

Further information with regards to the methodology / tools can be obtained at <http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html>

A.6. Registration date of the project activity:

>>

09.03.2011.

A.7. Crediting period of the project activity and related information (start date and choice of crediting period):

>>

Start date of the project activity:

24/08/2006 being the date of placement of purchase order for the WTGs.

Crediting Period: 10 years and 0 months
(From 2011 to 2021)

The billing date being the 10th day of every month, no apportioning has been done for Emission Reduction calculation.

A.8. Name of responsible person(s)/entity(ies):

>>

Organization:	Enercon (India) Limited
Street/P.O.Box:	Veera Desai Road
Building:	Enercon Tower
City:	Mumbai
State/Region:	Maharashtra
Postcode/ZIP:	400 053
Country:	India
Telephone:	+91 22 66924848
FAX:	+91 22 67040473
E-Mail:	Cdm.corporate@enerconindia.net

URL:	www.enerconindia.net
Represented by:	Mr Yogesh Mehra
Title:	Managing Director
Salutation:	
Last name:	
Middle name:	
First name:	
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal e-mail:	

SECTION B. Implementation of the project activity**B.1. Implementation status of the project activity**

>>

The first WTG under this project activity was commissioned on 17th December, 2007 and the last WTG was commissioned on 10th October, 2008. All 39 WTGs are Enercon make (E-53) having a capacity of 800kW each. The commissioning dates for the WTGs are as below:

Sl. No.	Commissioning Date	Location No. Of WTGs
1	17.12.2007.	170a
2		170
3		171
4		236
5	17.03.2008.	229
6		181
7		180
8		163
9		226
10		230
11	25.06.2008.	173
12		231
13		174
14		233
15		232
16		234
17		169A
18		237
19	07.07.2008.	168
20		169
21		235

22		136
23		137
24		138
25		139
26		140
27		141
28		179
29	11.09.2008.	228
30		172
31		227
32		239
33	29.09.2008.	167
34		176
35		178
36		164
37	10.10.2008.	165
38		166
39		177

Enercon operation and maintenance activities are ISO 9001:2000 certified and all the events are recorded at the project site. Referring to the data available, it can be inferred that there have not been any major special event for any machines that are included in the project activity. As a part of regular maintenance, the machines are stopped for mechanical and electrical maintenance for 16 to 18 hours annually and for visual inspection for 6 to 7 hours quarterly.

B.2. Revision of the monitoring plan

>>

Not applicable.

B.3. Request for deviation applied to this monitoring period

>>

Not applicable.

B.4. Notification or request of approval of changes

>>

Not applicable.

SECTION C. Description of the monitoring system

>>

The reading will be taken by the representatives of Enercon and the State utility at the meter(s) for the project activity connecting 39 turbines at the project site and feeding the pooling substation. This reading is recorded in the form of JMR (Form B) and is signed by the representatives of Enercon and State Utility. The electricity export and import will be metered at this metering point. Transmission loss between metering point feeding the pooling substation and the metering point at the EB Substation is applied to the meter reading taken at the feeder connecting 39 turbines of the project activity and feeding the pooling substation.

Transmission loss given in the JMR will be directly applied to the meter readings taken at the metering point of the project activity and feeding to pooling substation of Enercon. Net Electricity exported to the grid is calculated by applying transmission loss to the meter reading taken at the metering point of the project activity connecting 39 turbines and feeding to pooling substation of Enercon.

The electricity supplied to the grid is apportioned based on transmission Loss. The Joint meter reading contains the following data:-

1. Electricity Export
2. Electricity Import
3. Transmission Loss (Between the metering point feeding the pooling substation and the EB substation)
4. Net Electricity supplied to the Grid [Electricity Export-Electricity Import-Transmission Loss]

Joint Meter reading is signed by the representatives of Enercon and the state utility. The meter readings (both export and import), transmission loss and net electricity exported to the grid are noted in the JMR. Hence all these values will be reproduced from the JMR at the time of verification. Please refer Annex 4 for details on calibration and QA/QC procedures.

Transmission loss for export is certified by the state utility in JMR:

$$L = \sum G_{pe} - N$$

$\sum G_{pe}$ = Summation of electricity export data measured at all the feeders connected to pooling substation

N = Electricity export data measured at bulk meters at Enercon Substation

L = Total transmission loss

$$L_i = G_p * (L / \sum_j G_j)$$

The Project is operated and managed by GEL. The operational and maintenance contract for the project is with Enerconis an ISO 9001:2000 certified Quality Management system from Germanischer Lloyd. Enercon India Limited follows the documentation practices to ensure the reliability and availability of the data for all the activities as required from the identification of the site, wind resource assessment, logistics, finance, construction, commissioning and operation of the wind power project.

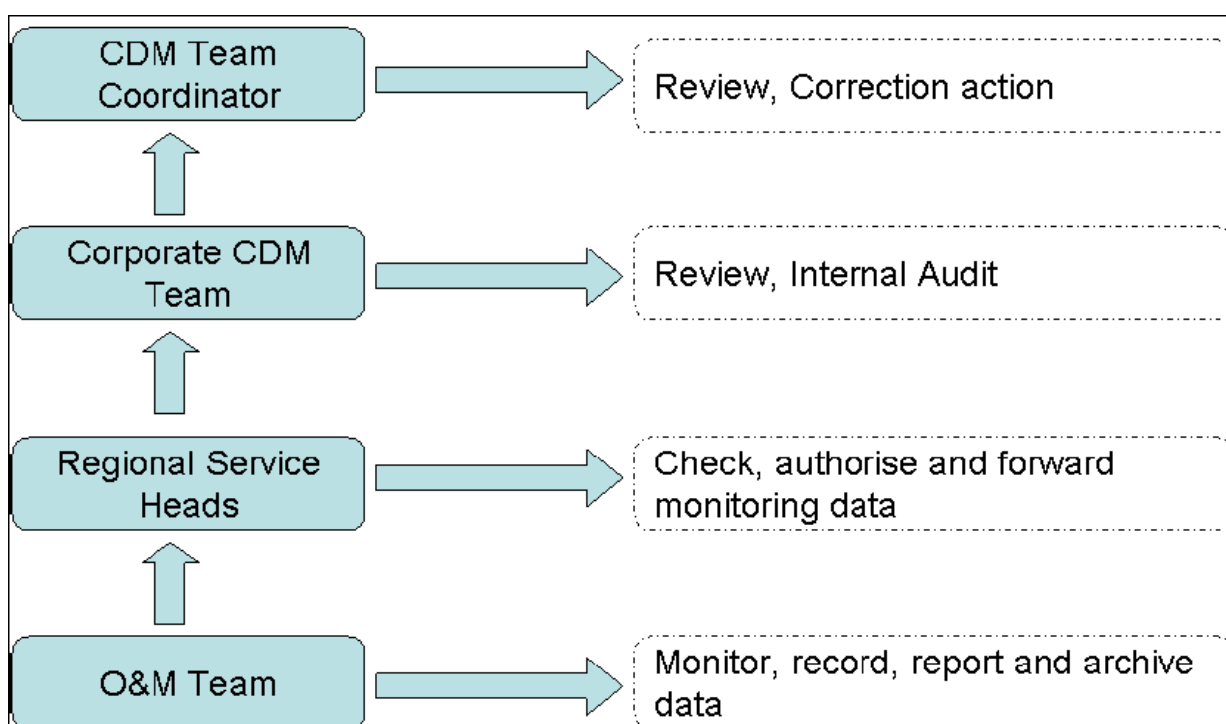
The accuracy of monitoring parameter is ensured by adhering to the calibration and testing procedure. All the meters will be tested for accuracy once every year. The project will adhere to all the mandatory regulatory and statutory requirements at the state as well as national level. Enercon is Operation and Maintenance contractor for the project activity and provides the daily generation report to the project proponent. The project proponent also maintains the records of daily generation report and joint meter report.

Training and maintenance requirements:

Training on the machine is an essential pre-requisite, to ensure necessary safety of man and machine. Further, in order to maximize the output from the Wind Energy Converters (WECs), it is extremely essential, that the engineers and technicians understand the machines and keep them in good health. In order to ensure, that Enercon's service staff is deft at handling technical snags on top of the turbine, the necessity of ensuring that they are capable of climbing the tower with absolute ease and comfort has been established. The Enercon Training Academy provides need-based training to meet the training requirements of Enercon projects. The needs are identified by Enercon based upon its experience on different wind farm sites, Enercon's service department identifies the service needs and professionals are trained accordingly in the training academy.

The training is contemporary, which results in imparting focused knowledge leading to value addition to the attitude and skills of all trainees. This ultimately leads to creativity in problem solving.

The operational and management structure implemented is as follows:



Metering: The electricity generated by the project is metered by the Parties (KPTCL/HESCOM, the Project Participant and Enercon) at the high voltage side of the step up transformer installed at the Project Site.

Metering Equipment: Metering system for the project activity consists of main and one check meter. Both the meters are **two-way trivector meters of accuracy class 0.2s capable of recording import and export of electricity**. The metering equipment is calibrated annually.

Meter Readings: The Net electricity supplied to the grid is recorded by taking a monthly Joint Meter Reading (JMR) in the presence of Parties (Officials from off-taking Utility (HESCOM) and Enercon). The Joint meter reading contains the value of energy imported and exported and the net export to the grid during the recording period. This Joint meter reading is certified by the Executive engineer of the off-taking utility and by Enercon Officials. These certified readings are then used by the off-taking Utility (HESCOM) to prepare the tariff invoices. Thus the net electricity supplied to the grid as mentioned in the JMR, can be cross-checked with the value mentioned in the invoices.

Inspection of Energy Meters: All main and check energy meters (export and import) and all associated instruments, transformers installed at the Project are of 0.2s accuracy class. Each meter is jointly inspected and sealed on behalf of the Parties and is not to be interfered with by either Party except in the presence of the other Party or its accredited representatives.

Meter Test Checking: There is a separate check and main meter. The Main and Check Meters are close to each other and will be tested for accuracy with a standard meter by the KPTCL's testing Division. The KPTCL will carry out the calibration, periodical testing, sealing and maintenance of meters. The KPTCL will provide a copy of the test reports.

If during the meter test checking,

- ✓ the main meter is found to be within the permissible limit of error and the corresponding check meter is beyond the permissible limits, then the meter reading will be as per the main meter as usual. The check meter shall, however, be calibrated immediately.
- ✓ the main meter is found to be beyond permissible limits of error, but the corresponding check meter is found to be within permissible limit of error, then the meter reading for the month up to the date and time of such test shall be as per the check meter. The main meter shall be calibrated immediately and meter reading for the period thereafter till the next monthly meter reading shall be as per the calibrated main meter.
- ✓ both the main meters and the corresponding check meters are found to be beyond the permissible limits of error, both the meters shall be immediately calibrated and the correction will be applied to the reading registered by the main meter to arrive the correct reading of energy supplied to the grid for the period up to the last test.

Moreover,

- If during any of the monthly meter readings, the variation between the main meter and the check meter is more than the permissible limit for meters of 0.2s accuracy class, all the meters shall be re-tested and calibrated immediately and the correction will be applied to the reading registered by the main meter to arrive the correct reading of energy supplied to the grid for the period up to last test.
- In case of the failures such as burning of the meter and the erratic display of the metered parameters and when the error found in testing the meters is beyond the permissible limit of error, the meter shall be calibrated immediately and the correction will be applied to the reading registered by the main meter to arrive the correct reading of energy supplied to the grid for the period up to last test.

The daily records for parameters such as power generation, frequency and voltage of the individual machines are noted by the SCADA system. These records are maintained by Enercon India Limited (the O&M contractor) and the PP.

Calculation of Data to be monitored:

$$EGy = Gp - Li$$

EGy = Net Electricity supplied to grid by the project activity

Gp = Generation of electricity by the project activity recorded at the feeder connected to 39 turbines of the project activity [export (Gpe) – 115%*Import (Gpi)]

L_i = Transmission loss

Transmission loss is certified by the state utility in JMR:

$$L = \sum_j G_j - N$$

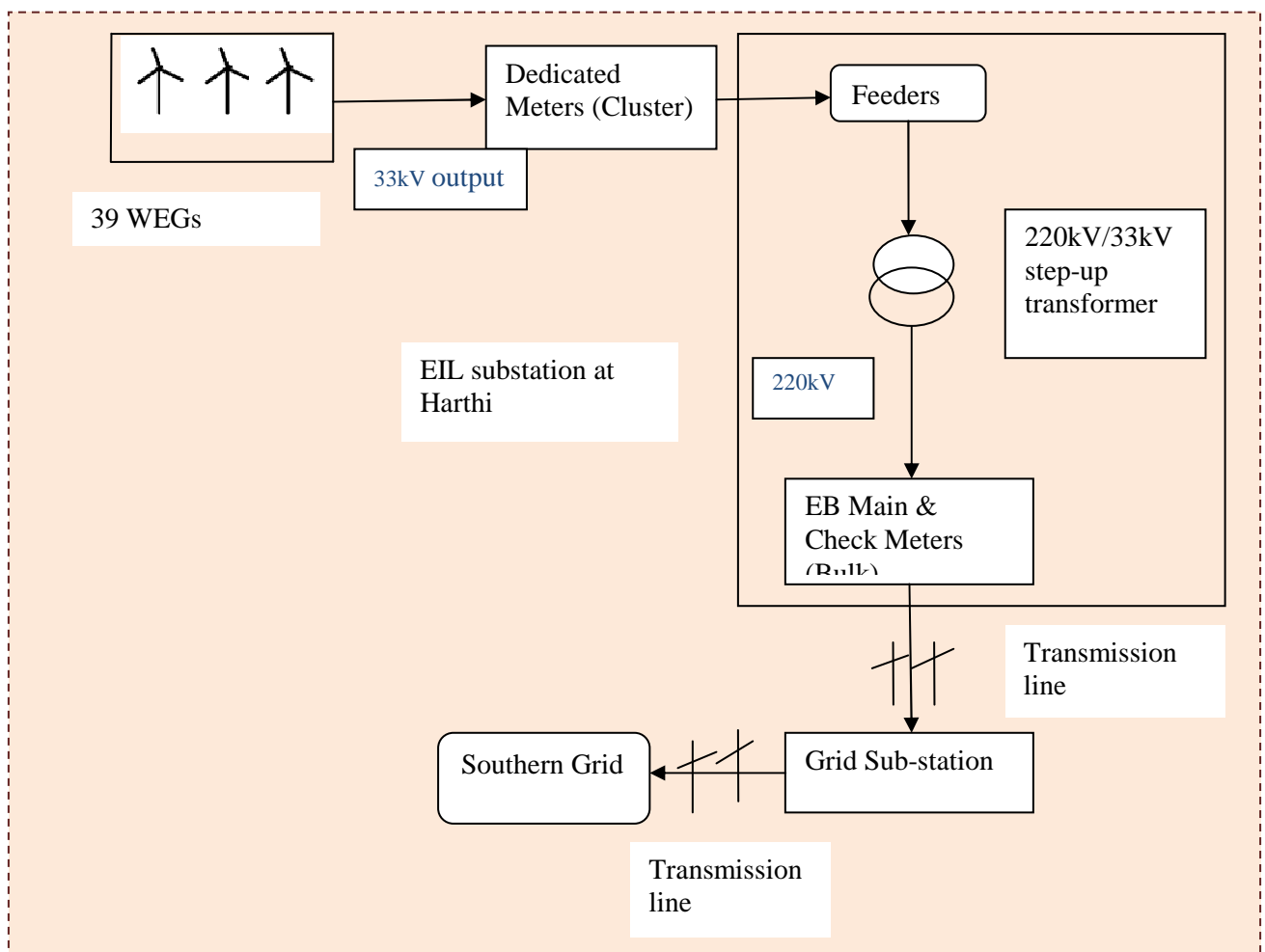
$\sum_j G_j$ = Summation of electricity generation data measured at all the feeders connected to pooling substation (Export)

N = Electricity generation data measured at Substation from the feeders emanating from the pooling substation (Export)

L = Total transmission loss

$$L_i = G_p * (L / \sum_j G_j)$$

The line diagram of the metering system for the project activity is as follows:



SECTION D. Data and parameters

D.1. Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors

(Copy this table for each data and parameter. To report multiple values, a table may be used)

Data / Parameter:	$EF_{grid,OM,y}$
Data unit:	tCO ₂ e/MWh
Description:	Operating Margin Emission Factor of Southern Regional Electricity Grid
Source of data used:	<p>“CO₂ Baseline Database for Indian Power Sector” Version 04 published by the Central Electricity Authority, Ministry of Power, Government of India.</p> <p>The “CO₂ Baseline Database for Indian Power Sector” is available at www.cea.nic.in</p>
Value(s) :	0.998157
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission
Additional comment:	The value is calculated on ex-ante basis and it will remain same throughout the crediting period.

Data / Parameter:	$EF_{grid,BM,y}$
Data unit:	tCO ₂ e/MWh
Description:	Build Margin Emission Factor of Southern Regional Electricity Grid
Source of data used:	<p>“CO₂ Baseline Database for Indian Power Sector” Version 04 published by the Central Electricity Authority, Ministry of Power, Government of India.</p> <p>The “CO₂ Baseline Database for Indian Power Sector” is available at www.cea.nic.in</p>

Value(s) :	0.71332
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission
Additional comment:	The value is calculated on ex-ante basis and it will remain same throughout the crediting period.

Data / Parameter:	$EF_{grid,CM,y}$
Data unit:	tCO ₂ e/MWh
Description:	Combined Margin Emission Factor of Southern Regional Electricity Grid
Source of data used:	“CO ₂ Baseline Database for Indian Power Sector” Version 04 published by the Central Electricity Authority, Ministry of Power, Government of India. The “CO ₂ Baseline Database for Indian Power Sector” is available at www.cea.nic.in
Value(s) :	0.92694
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission
Additional comment:	The value is calculated on ex-ante basis and it will remain same throughout the crediting period.

D.2. Data and parameters monitored	
<i>(Copy this table for each data and parameter. To report multiple values, a table may be used)</i>	
Data / Parameter:	EGy
Data unit:	MWh (Mega-watt hour)
Description:	Net electricity supplied to the grid by the Project activity
Measured /Calculated /Default:	Measured
Source of data:	Electricity supplied to the grid as per the tariff invoices (B-form) raised on KPTCL/HESCOM.
Value(s) of monitored parameter:	39,552
Indicate what the data are used for (Baseline/ Project/ Leakage emission)	Baseline emission calculation

calculations)	
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Energy meters are L&T make 0.2s accuracy class. The meters are calibrated once in a year. The last calibration was done on 29th June, 2011. Serial number of the cluster meter is 05389382.
Measuring/ Reading/ Recording frequency:	On monthly basis.
Calculation method (if applicable):	<p>The net supplied electricity is calculated after deducting the net import and transmission loss from the gross generation.</p> <p>Net electricity supplied to the grid = Gross electricity generated – Import – Transmission loss</p> <p>The same is reflected in the B-form released by KPTCL/HESCOM. The billing date is 1st day of every month.</p>
QA/QC procedures applied:	QA/QC procedures is implemented by KPTCL/HESCOM pursuant to the provisions of the power purchase agreement.

Data / Parameter:	Gpe
Data unit:	MWh (Mega-watt hour)
Description:	Electricity Export recorded at the meter(s) connected 39 machines of the project activity.
Measured /Calculated /Default:	Measured
Source of data:	Dedicated cluster meter reading and JMR
Value(s) of monitored parameter:	40,878
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculation
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Energy meters are L&T make 0.2s accuracy class. The meters are calibrated once in a year. The last calibration was done on 29th June, 2011. Serial number of the cluster meter is 05389382.
Measuring/ Reading/ Recording frequency:	On monthly basis. Electricity export to the grid is recorded by the meter(s) connected to the 39 machines of the project activity feeding the pooling substation of Enercon at Harthi.
Calculation method (if applicable):	-
QA/QC procedures applied:	QA/QC procedures is implemented by KPTCL/HESCOM pursuant to the provisions of the power purchase agreement.

Data / Parameter:	Gpi
Data unit:	MWh (Mega-watt hour)
Description:	Electricity Import recorded at the meter(s) connected 39 machines of the project activity.
Measured /Calculated /Default:	Measured
Source of data:	Electricity import from the grid as per the joint meter

	report.
Value(s) of monitored parameter:	15.70
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculation
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Energy meters are L&T make 0.2s accuracy class. The meters are calibrated once in a year. The last calibration was done on 29th June, 2011. Serial number of the cluster meter is 05389382.
Measuring/ Reading/ Recording frequency:	On monthly basis.
Calculation method (if applicable):	-
QA/QC procedures applied:	QA/QC procedures is implemented by KPTCL/HESCOM pursuant to the provisions of the power purchase agreement.

Data / Parameter:	Li
Data unit:	MWh (Mega-watt hour)
Description:	Transmission loss between the metering point for the project activity feeding the pooling substation of Enercon and the metering point at EB Substation.
Measured /Calculated /Default:	Measured and then apportioned for each customer
Source of data:	Calculated from the difference between the bulk meter reading and individual cluster meter reading. The total loss is then distributed between each customer by apportioning the loss.
Value(s) of monitored parameter:	229
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculation
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Energy meters are L&T make 0.2s accuracy class. The meters are calibrated once in a year. The last calibration was done on 29 th June, 2011. Serial number of the cluster meter is 05389382.
Measuring/ Reading/ Recording frequency:	On monthly basis.
Calculation method (if applicable):	-
QA/QC procedures applied:	QA/QC procedures is implemented by KPTCL/HESCOM pursuant to the provisions of the power purchase agreement.

SECTION E. Emission reductions calculation

E.1. Baseline emissions calculation

>>

As described in the registered PDD, the baseline emission $BE_y = EG_y * EF_y$

Where,

BE_y = baseline emissions in year y, tCO₂e

EG_y = net electricity supplied to the grid in year y and applied directly from the invoice.

EF_y = CO₂ emission factor of the grid (0.92694 tCO₂e/ MWh; fixed ex-ante).

Therefore, Baseline Emission for the monitoring period 01/04/2011 to 30/09/2011 is

$$BE_y = EG_y * EF_y$$

$$= 37,984 \text{ (MWh)} * 0.92694 \text{ (tCO}_2\text{/MWh)}$$

$$= 35,209 \text{ tCO}_2$$

E.2. Project emissions calculation

>>

The project activity uses wind power to generate electricity and hence the emissions from the project activity have been taken as zero.

Therefore,

$$PE_y = 0$$

E.3. Leakage calculation

>>

No leakage has been considered from the project activity as per the approved methodology ACM0002.

Therefore,

$$Ly = 0$$

E.4. Emission reductions calculation / table

>>

Project Title	Name of Site	Name of State	Generation (April 2011 to September 2011)kWh	Baseline (tCO₂/MWh)	Emission Reduction (CO₂)
GEI Wind Power Project in Karnataka, India	Gadag	Karnataka	37,984,218	0.92694	35,209

E.5. Comparison of actual emission reductions with estimates in the CDM-PDD

>>

This section shall include a comparison of actual values of the emission reductions achieved during the monitoring period with the estimations in the registered CDM-PDD.

Item	Values applied in ex-ante calculation of the registered CDM-PDD	Actual values reached during the monitoring period (April 2011 – September 2011)
Emission reductions (tCO ₂ e)	32,048 for six months with an annual estimation of emission reduction of 64,095	35,209 which is 9% greater than the estimated value.

E.6. Remarks on difference from estimated value in the PDD

>>

The actual generation during the monitoring period is higher than it was assumed in the registered PDD because

- Higher wind speed in the region during the current monitoring period
- There was almost no lull-time during the monitoring period

The assumed and actual PLF values are shown below:

Year	Generation @ Full Capacity (kWh)	Actual Generation (kWh)	Estimated PLF	Actual PLF
April 2011-September 2011	136,656,000	37,984,218	25.3%	27.80%

The actual PLF is only 2.3% higher than the estimated PLF in the registered PDD which is, within the sensitivity range that is stipulated in the PDD as well.

History of the document

Version	Date	Nature of revision
01	EB 54, Annex 34 28 May 2010	Initial adoption.
Decision Class: Regulatory Document Type: Guideline, Form Business Function: Issuance		