Monitoring report form (Version 03.0)

Monitoring report

Title of the project activity	2.5 MW BEL grid -connected wind power project at Davangere district, Karnataka, India
Reference number of the project activity	Project Reference No: 1216
Version number of the monitoring report	Version 1.1
Completion date of the monitoring report	06/12/2012
Registration date of the project activity	05/11/2007
Monitoring period number and duration of this monitoring period	Second monitoring period which starts from 01/04/2009 to 31/03/2012(Both days included)
Project participant(s)	M/s. Bharat Electronics Limited., Jalahalli, Bangalore, Karnataka, India
Host Party(ies)	India (Host)
Sectoral scope(s) and applied methodology(ies)	Sectoral Scope: 01 'Energy industries (renewable - / non-renewable sources)' Methodology: "Grid Connected Renewable Electricity Generation", AMS ID Version 10.
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	16081.20 tCO2e (From 01/04/2009 to 31/03/2012) 5360.40 tCO2e (Emission reduction estimated for 12 months period)
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	11,011 tCO2 equivalent

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

>> The project activity consists of the implementation of 2.5MW Wind Energy Power Plant near Basavapatna Village of Davanagere District, Karnataka, India. The Wind farm is composed of:

> Five numbers of Wind Electric Generators (WEG) of 0.5MW, 690 V

> An electrical transformer substation, 690V/33000V for each WEG.

> A common Metering station with main and check meters.

> The geographical location of wind farm site are $14^0$13'N latitude and $75^0$47'E longitude.

The project proponent M/s. Bharat Electronics Limited (BEL), a leading electronics company in India, installed the plant for producing electricity from the renewable source, namely Wind Energy. This renewable energy will be used to meet its power requirement partially displacing fossil fuel based electrical energy supplied by the electricity supply company and thereby reduce GHG emissions. The energy generated is injected to 66,000volts, grid of the Karnataka Power Transmission Corporation Limited for wheeling to BEL.

The expected operational lifetime of the project is 25 years. The total emission reductions achieved under this monitoring period (01 April 2009 to 31 March 2012) is 11,011 tCO2e.

A.2. Location of project activity

>> The project area extends between latitude are $14^0$13'N latitude and $75^0$47'E longitude.

The Project is connected to the KPTCL 66/33 kV substation at Basavapatna village. The project activity is located at Kothihillu site, near Basavapatna village, Chennagiri taluk in Davangere district in the state of Karnataka, India.

The following are the unique identification numbers and location of the five wind mills:

Sl.No.	Location	Machine(windmill) Identification No.
1	31	589
2	32	587
3	33	588
4	34	590
5	35	584

The geographical location of the project activity is given in maps below.

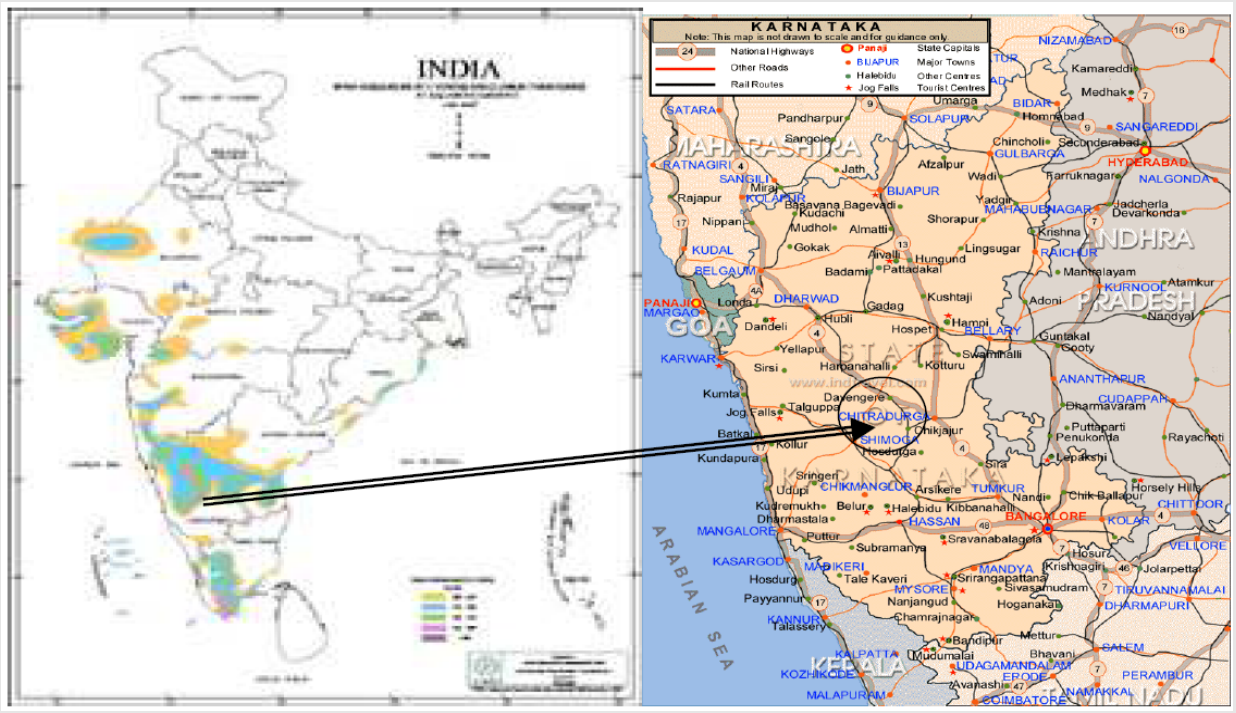


Figure 1: Maps showing the location of the project activity in the state of Karnataka, India

A.3. Parties and project participant(s)

Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
India (Host)	M/s. Bharat Electronics Limited – Public Entity	No

A.4. Reference of applied methodology

>> Methodology: "Grid Connected Renewable Electricity Generation", AMS ID Version 10[1].

Tools referenced in this methodology:

"Tool to calculate the emission factor of an electricity system[2]"

"Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion[3]"

A.5. Crediting period of project activity

>> The duration of the crediting period is from 05 November 2007 to 04 November 2017 (10 years Fixed).

[1] http://cdm.unfccc.int/methodologies/SSCmethodologies/approved
[2] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.pdf
[3] http://cdm.unfccc.int/Reference/tools/ls/meth_tool03_v02.pdf

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

>> The project activity involves setting up of 5 numbers of wind turbines of capacity 0.5 MW each (of Vestas RRB make) totaling to 2.5 MW in the state of Karnataka. All the machines under the project activity were connected to the grid and commissioned on 30th September 2006. The commissioning date for all the machines included in the project activity is given in the table below.

Unique Identification Number	Loc. No.	Date of Commissioning
589	31	30/09/2006
587	32	30/09/2006
588	33	30/09/2006
590	34	30/09/2006
584	35	30/09/2006

Technology

Salient features of the technology are as follows:

- The turbine is a pitch controlled upwind turbine with active yaw and a rotor with three blades. Pitch control means that blades can pivot on their own longitudinal axis. The pitch control is used for speed control, optimization of power production and to start and stop the turbine.
- The pitch control is performed by activating a hydraulic/mechanical system. The hydraulic system is also used for the disc brake system.
- Yawing is done by two electrical yaw gear motors, which mesh with a toothed wheel mounted on top of the tower. The bearing system is a slide system with built-in-friction.
- The blades are made from glass fibre. The shells are made in a light sandwich construction and mounted on a supporting closed beam of prepeg. Through a bonded aluminium root-insert the blades are bolted to the blade bearing. The blade bearing is bolted to the blade hub.
- The mechanical power from the rotor is transmitted through the main shaft to the gearbox. The gearbox is a combination of planet and helical gears.
- From the gearbox the power is transmitted through a cardan shaft to the generator. For 0.5MW, the generator is designed with constant slip of 2-3% depending on the type of generator.
- All functions of the turbine are monitored and controlled by a microprocessor based control unit, called the MP-controller (Multi Processor controller).
- The 'Emergency Stop Button' activates both the aerodynamics brake and the hydraulic disc brake, which is placed at the high speed shaft of the gearbox.
- The nacelle/hub is fully enclosed in a glass fibre reinforced polyester cover. The nacelle can be opened at the reverse and with the crane it is possible to bring up tools, spare parts etc.

Further, the project activity includes construction of a 66kV double-circuit line with Coyote conductor for a distance of 17 km from the project site to the existing 220/66 kV sub-station located at Honnali. Terminal bays have been provided for each circuit lines at the ends.

The power curve (i.e. wind velocity v/s effective power generation) for a 0.5 MW wind turbo-generator is shown in Figure 2 below.

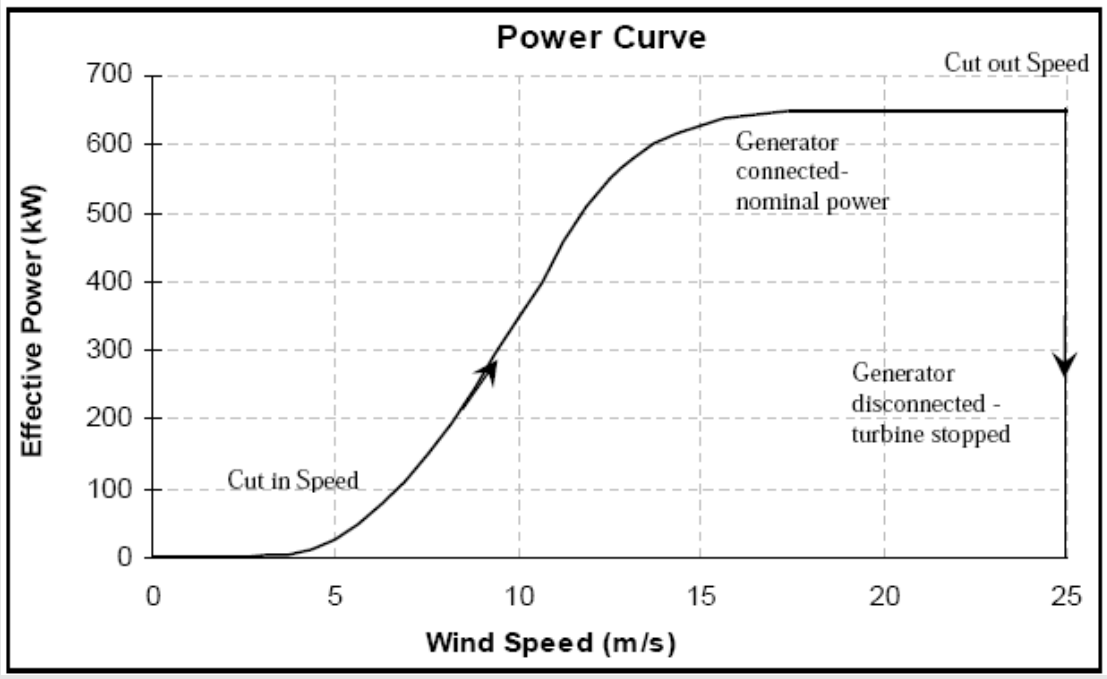


Figure 2: Power curve of the 0.5 MW wind turbo-generator (Source: Vestas RRB)

Overall Data:

1. Cut in wind speed	: 4 m/s
2. Cut out wind speed	: 25 m/s
3. Hub height	: 50 m
4. Nacelle tilt angle	: 5^{O}
5. Regulation	: Pitch

Generator

1. Rated power output	: 0.5 MW electrical
2. Type	: Asynchronous
3. Voltage	: 690 V
4. Revolutions	: 1526 rpm
5. Frequency	: 50 Hz

Rotor

1. No of blades	: 3
2. Diameter	: 47 m
3. Swept area	: 1735 m^2

Controls : Microprocessor based

Since the time when the project started its operation/commissioned, there were no major breakdown or plant outage or exchange of equipments has taken place.

No adverse situation has arisen during the monitoring period of the project which may eventually impact the applicability of the methodology.

The PP (BEL) is an ISO certified and all the events are recorded in the log book available at the project site. Referring to the data available, it can be inferred that there have not been any major special events for any of the machines that are included in the project activity.

B.2. Post registration changes

B.2.1. Temporary deviations from registered monitoring plan or applied methodology

>> None

B.2.2. Corrections

>> None

B.2.3. Permanent changes from registered monitoring plan or applied methodology

>> None

B.2.4. Changes to project design of registered project activity

>> None

B.2.5. Changes to start date of crediting period

>> None

B.2.6. Types of changes specific to afforestation or reforestation project activity

>> Not Applicable

SECTION C. Description of monitoring system

>> Approved monitoring methodology AMS ID Version 10 Sectoral Scope: 1, "Grid connected renewable electricity generation", by CDM - Meth Panel is proposed to be used to monitor the emission reductions.

This approved monitoring methodology requires monitoring of the following:

- Net electricity generation from the project activity; and
- Operating margin emission factor and build margin emission factor of the grid, where ex ante determination of grid emission factor has been chosen.

Since the baseline methodology is based on ex ante determination of the baseline, the monitoring of operating margin emission factor and build margin emission factor is not required. There is one main and check meter dedicated to project activity at 33kV metering point for the project activity. In addition to this there is one main and check meters (bulk meters) at 66 kV metering point at the RRB substation and are connected to the machines of the project activity and the machines commissioned by the other project developers. Therefore in order to determine the electricity supplied to the grid by the project at 66 kV at the RRB Basavapatna substation, the state utility applies the transmission loss to the meter reading recorded at the 33 kV metering point. The transmission loss calculated by the state utility is endorsed / confirmed jointly by the representatives of BEL and the state utility. The transmission loss applied to the project activity by the state utility is reflected in the JMR (Form B) recorded at 33kV metering point. Electricity supplied to the grid is calculated by applying transmission loss to the meter readings taken at 33 kV metering location of the project activity.

The procedure for calculation of transmission loss as given in the JMR is set-out below:

$$Z = \frac{(X1+X2+X3...+Xn)-Y}{(X1+X2+X3...+Xn)} \times 100$$

Z = Percentage transmission loss for export incurred in transmission line between the meter located at 33 kV metering point and the meters located at 66kV metering point (two bulk meters) high voltage side of receiving sub-station.

Xi = Energy Export Reading of energy meter installed at 33kV metering point.

Here Xi represents X1, X2, X3,...Xn which are the meters that are installed at 33kV metering point and are connected to the receiving substation by internally connected lines to the receiving station.

Y = Energy Export Readings at bulk meters (two in number) installed at high voltage side of transformer of the receiving station at 66 kV.

The Export Reading Xi is adjusted for transmission loss that is determined by the state utility and is applied directly to the JMR (Form B) taken at 33 kV metering point. This can be checked from the JMR signed jointly by the representatives of PP and the state utility.

Transmission Loss in Export (TE) = Transmission Loss (Z) * Energy Export at 33kV metering point (EGExport)

Empirical Formula for Energy Export after adjustment of transmission loss
(Equation 1)

Net Energy Export after adjustment of transmission loss = EGexport – Transmission Loss (TE)

The transmission loss in export is generally less than 5%. However in case of Energy Import, the state utility conservatively applies adjustment of 15% to the import values noted at 33 kV metering point.

Transmission Loss in Import (TI) = 15% * Energy Import at 33kV metering point (EGImport)

Empirical Formula for Energy Import after adjustment of transmission loss
(Equation 2)

Net Energy Import after adjustment of transmission loss = EGimport +15%*EGimport

= 115%* EGimport

Therefore Energy Supplied to Grid after adjustment of transmission loss is difference of equation 1 and 2 as given in the JMR (Form B) signed jointly by representatives of PP and the state utility.

EGy = EGexport – 115%*EGimport – Transmission Loss (TE)

The Joint meter reading noted at 33 KV metering location contains the following data:-

1. Electricity Export (EGexport)
2. Electricity Import (EGimport)
3. Transmission Loss (TE) between 33 kV metering point and 66kV metering point (two bulk meters) at RRB pooling substation

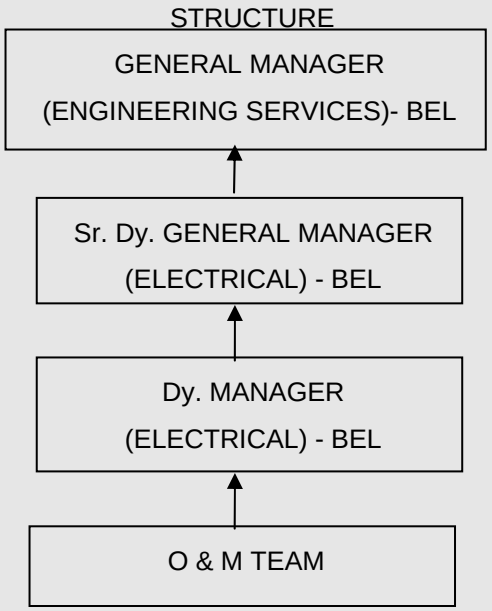
Electricity supplied to the Grid [EGexport-115%*EGimport-TE]

JMR is signed by the representatives of PP and the state utility. The meter readings (both export and import), transmission loss and electricity supplied to the grid are recorded in the JMR (33 KV metering Point). Hence all these values will be reproduced from the JMR for calculation of emission reductions.

In addition to the JMR (Form B) at 33kV metering location for the project activity, the following documents will also be provided to the DoE for verification:

1. JMR (Form B) at PP 66kV metering point (two bulk meters) at RRB substation.
2. Transmission loss calculation endorsed / confirmed jointly by the representatives of PP and the state utility.

The Project is operated and managed by BEL (PP). The operational and management structure implemented by BEL is as follows:



Monitoring Information:

For the purpose of monitoring, the project proponent has entered into an operation and maintenance Agreement with the supplier of machines M/s Vestas RRB India Ltd. for a period of twenty years from the date of commissioning.

The contractor shall draw the preventive maintenance schedules and attend to the breakdowns keeping in view that machine availability would be minimum 95%.

THE DETAILS ARE AS BELOW.

Metering: Electricity supplied to the grid is metered jointly by state utility and PP through one main and one check meter at 33 kV metering point connecting exclusively the machines of project activity.

In addition to this, there is one main and check meters (Bulk meters) at 66 kV metering point at RRB substation covering machines of the project activity and machines of other project developers. The schematic diagram indicating location of meters at 33 kV and 66kV metering points for the project activity is attached as Appendix 1.

Metering Equipment: Metering system for the project activity consists of one main and one check meter of 0.2 percent accuracy class at 33kV metering point and one main and one check meter at 66 kV metering point. All the meters are two-way Trivector meters capable of recording import and export of electricity. The meters installed are capable of recording and storing half hourly readings of all electrical parameters for a minimum period of 35 days with digital output.

Meter Readings: The electricity supplied to the grid is recorded by taking JMR for 2.5 MW at 33kV metering point in the presence of representatives of state utility and BEL. The JMR at 33kV metering point contains the value of energy exported, energy imported, transmission loss and electricity supplied to the grid during the recording period. This JMR is certified by state utility. These certified readings are then used for wheeling of energy.

Inspection of Energy Meters: All main and check energy meters and all associated instruments, transformers installed at the Project are of 0.2% 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 authorized representatives.

Meter Test Checking: All main and check meters are tested for accuracy with reference to a portable standard meter. The portable standard meter is owned by state utility. The main and check meters shall be deemed to be working satisfactorily if the errors are within specifications for meters of 0.2 accuracy class. The consumption registered by the main meters alone will hold good for the purpose of metering electricity supplied to the grid as long as the error in the main meters is within the permissible limits. All the meters will be tested / calibrated for accuracy periodically.

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 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. There will be a revision in the meter reading for the period from the previous calibration test up to the current test based on the readings of 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 applied to the reading registered by the main meter to arrive the correct reading of energy supplied for metering electricity supplied to the grid for the period from the last month's meter reading up to the current test. Meter reading for the period thereafter till the next monthly reading shall be as per the calibrated main meter.

Meter details for the all the main and check meters are as follows:-

1. INDIVIDUAL COMMON METER (BEL) - RR NO. BVP 14 at 33 kV metering point

(Location: Kothihillu site near Basavapatna village)

Particulars	Main meter	Check Meter
Meter Serial Number	05463854	05463848
Meter class	0.2	0.2
Model	ER 300 P	ER 300 P
Configuration	3 Phase, 4 Wire	3 Phase 4 Wire
Voltage	-/110V	-/110V
Current	-/1A	-/1A
Make	L&T	L&T
Date of calibration	10.01.2012	10.01.2012

2. BULK METER COMMON TO ALL PROJECTS- RR NO.BVP-01

(Location:- 66 KV MUSS of KPTCL, Basavapatna)

Particulars	Main meter	Check Meter
Meter Serial Number	05463980	05463978
Meter class	0.2	0.2
Model	ER300P	ER300P
Configuration	3 Phade 4 Wire	3 Phase 4 Wire
Voltage	-/110V	-/110V
Current	-/1A	-/1A
Make	L&T	L&T

The line diagrams showing all relevant monitoring points are attached as Appendix 1.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante or at renewal of crediting period

Data/Parameter	**EFy**
Unit:	kg CO2/kWh
Description:	CO2 emission factor of the grid
Source of data:	Calculated as weighted average of simple OM, BM
Value(s) applied):	0.9323 kg CO2/kWh
Purpose of data:	Baseline Emission calculation
Additional comment:	

Data/Parameter	**$EF_{OM, Y}$**
Unit:	kg CO2/kWh
Description:	CO2 operating margin emission factor of the grid
Source of data:	Calculated
Value(s) applied):	1.0037 kg CO2/kWh
Purpose of data:	Baseline Emission calculation
Additional comment:	

Data/Parameter	**$EF_{BM, Y}$**
Unit:	kg CO2/kWh
Description:	CO2 Build margin emission factor of the grid
Source of data:	Calculated y
Value(s) applied):	0.7179 kg CO2/kWh
Purpose of data:	Baseline Emission calculation
Additional comment:	

D.2. Data and parameters monitored

Data/Parameter	EGy
Unit:	MWh (Mega-watt hour)
Description:	Net electricity supplied to the grid by the Project Activity.
Measured/Calculated /Default:	Data has been recorded on a monthly basis.Net electricity is calculated as generation minus transmission losses-115% of Import energy.
Source of data:	As per the Joint Meter Readings (JMR).
Value(s) of monitored parameter:	Unit wise monthly details are provided in the emission reduction spread sheet and in the table below
Monitoring equipment:	Meter Serial No.: 05463854(main meter) & 05463848 (Check meter) Class :0.2 Model : ER300P Configuration : 3 Phase, 4 Wire Voltage : -/110V Current : -/1A Make : L&T Date of calibration: The metering equipments were inspected & calibrated by state utility. The calibration of meters is done once in a year. Date of calibration 29.03.2009 15.04.2010 25.04.2011 28.04.2012 However during the monitoring period, the calibration of meters has also been done on 31.08.2010, 31.10.2011, 10.01.2012 by KPTCL which is out of control of project proponent. It is found that during calibration of meters, the errors are found within permissible limits of 0.2%.
Measuring/Reading/ Recording frequency:	Monitored continuous and aggregated .All data are recorded monthly.
Calculation method (if applicable):	-
QA/QC procedures:	The meter reading of net electricity fed to the grid is undertaken by KPTCL personnel jointly with BEL representatives at site. Further KPTCL will submit energy receipts to BEL on a monthly basis. The meter is calibrated and sealed by KPTCL. Main meter reading is cross checked with check meter reading at site for any accuracy deviation beyond permissible limits. Hence uncertainty is low.
Purpose of data:	Calculation of the emission reduction.
Additional comment:	The data (electricity supplied to the grid) will be archived on electronic media as well as on paper. The archive will be kept for the period up to two years after the completion of crediting period.

Summary of Baseline emissions (after application of error factors)

Month	Export EGexport	Import EGimport	Transmission Loss TE	Net Generation Egy	Baseline Emmission Factor (EFy)	Baseline Emissions
	(MWh)	(MWh)	(MWh)	(MWh)	(tCO2e/MWh)	(tCO2e)
April 2009 (01-Apr-2009 to 30-Apr-2009)	275.850	4.399	5.655	265.796	0.9323	247.80
May 2009 (01-May-2009 to 31-May-2009)	448.200	2.846	7.255	438.099	0.9323	408.44
June 2009 (01-Jun-2009 to 30-Jun-2009)	549.225	1.035	9.811	538.379	0.9323	501.93
July 2009 (01-July-2009 to 31-July-2009)	1006.875	0	20.051	986.824	0.9323	920.02
August 2009 (01-Aug-2009 to 31-Aug-2009)	457.425	1.811	8.541	447.073	0.9323	416.81
September 2009 (01-Sep 2009 to 30-Sep-2009)	375.525	2.588	7.463	365.475	0.9323	340.73
October 2009 (01-Sep-2009 to 31-Sep-2009)	288.225	4.140	6.456	277.629	0.9323	258.83
November - 2009 (01-Nov-2009 to 30-Nov-2009)	214.875	1.811	4.539	208.525	0.9323	194.41
December - 2009 (01-Dec-2009 to 31-Dec-2009)	247.725	2.588	5.934	239.204	0.9323	223.01
January - 2010 (01-Jan-2010 to 31-Jan-2010)	128.925	3.623	3.549	121.754	0.9323	113.51
February - 2010 (01-Feb-2010 to 28-Feb-2010)	93.600	4.916	2.582	86.102	0.9323	80.27

March - 2010 (01-Mar-2010 to 31-Mar-2010)	144.450	5.175	4.041	135.234	0.9323	126.08
April - 2010 (01-Apr-2010 to 30-Apr-2010)	200.250	4.399	4.585	191.266	0.9323	178.32
May - 2010 (01-May-2010 to 31-May-2010)	407.925	2.070	7.882	397.973	0.9323	371.03
June - 2010 (01-Jun-2010 to 30-Jun-2010)	535.950	1.294	9.965	524.691	0.9323	489.17
July - 2010 (01-July-2010 to 31-July-2010)	613.575	0.518	10.970	602.088	0.9323	561.33
August - 2010 (01-Aug-2010 to 31-Aug-2010)	486.000	1.811	9.264	474.925	0.9323	442.77
September - 2010 (01-Sep-2010 to 30-Sep-2010)	313.650	2.846	5.845	304.959	0.9323	284.31
October - 2010 (01-Oct-2010 to 31-Oct-2010)	207.900	3.811	4.992	199.027	0.9323	185.55
November - 2010 (01-Nov-2010 to 30-Nov-2010)	108.000	5.175	2.585	100.240	0.9323	93.45
December - 2010 (01-Dec-2010 to 31-Dec-2010)	179.775	3.364	3.718	172.693	0.9323	161.00
January - 2011 (01-Jan-2011 to 31-Jan-2011)	220.500	3.105	4.285	213.110	0.9323	198.68
February - 2011 (01-Feb-2011 to 28-Feb-2011)	198.675	3.105	4.070	191.500	0.9323	178.54
March - 2011 (01-Mar-2011 to 31-Mar-2011)	189.000	4.658	4.404	179.939	0.9323	167.76
April - 2011 (01-Apr-2011 to 30-Apr-2011)	168.750	6.210	4.084	158.456	0.9323	147.73

May - 2011 (01-May-2011 to 31-May-2011)	356.625	3.105	7.097	346.423	0.9323	322.97
June - 2011 (01-Jun-2011 to 30-Jun-2011)	706.500	0.259	13.866	692.375	0.9323	645.50
July - 2011 (01-July-2011 to 31-July-2011)	801.675	0.259	15.136	786.280	0.9323	733.05
August - 2011 (01-Aug-2011 to 31-Aug-2011)	614.700	0.776	11.343	602.581	0.9323	561.79
September - 2011 (01-Sep-2011 to 30-Sep-2011)	438.525	1.553	8.539	428.434	0.9323	399.43
October - 2011 (01-Oct-2011 to 31-Oct-2011)	123.075	4.916	3.098	115.061	0.9323	107.27
November - 2011 (01-Nov-2011 to 30-Nov-2011)	303.525	2.329	5.754	295.442	0.9323	275.44
December - 2011 (01-Dec-2011 to 31-Dec-2011)	279.225	2.329	5.087	271.809	0.9323	253.41
January - 2012 (01-Jan-2012 to 31-Jan-2012)	111.150	4.658	2.790	103.703	0.9323	96.68
February - 2012 (01-Feb-2012 to 29-Feb-2012)	200.475	4.140	4.312	192.023	0.9323	179.02
March - 2012 (01-Mar-2012 to 31-Mar-2012)	166.050	6.469	3.954	155.627	0.9323	145.09
Total EGy				**11810.716**	**Total BEy**	**11011.13**

D.3. Implementation of sampling plan

>> Not Applicable

SECTION E. Calculation of emission reductions or GHG removals by sinks

E.1. Calculation of baseline emissions or baseline net GHG removals by sinks

>> "The 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 the weighted average emissions (in Kg CO2e/kWh) as described in registered PDD.

BEy = EGy * EFy

Where,

BE is baseline emissions in year y, tCO2e

EGy is the net electricity supplied to the grid in year y and is applied directly from JMR (Form B) certified by state utility.

EFy is the CO2 emission factor of the grid (0.9323 tCO2e/MWh fixed ex-ante)

Total Baseline emissions: As per Summary of Baseline emissions table mentioned above, 11,011 tCO2 (rounded down value).

E.2. Calculation of project emissions or actual net GHG removals by sinks

>> Since the project activity is a renewable energy project which generates electricity using wind power and hence does not result in project emissions.

E.3. Calculation of leakage

>> No leakage is considered from the project activity as per approved methodology AMS ID.

E.4. Summary of calculation of emission reductions or net anthropogenic GHG removals by sinks

Item	Baseline emissions or baseline net GHG removals by sinks (t CO2e))	Project emissions or actual net GHG removals by sinks(tCO2e)	Leakage (tCO2e)	Emission reductions or net anthropogenic GHG removals by sinks(tCO2e)
01-Apr-2009 to 30-Apr-2009	247.80	0	0	247.80
01-May-2009 to 31-May-2009	408.44	0	0	408.44
01-Jun-2009 to 30-Jun-2009	501.93	0	0	501.93
01-July-2009 to 31-July-2009	920.02	0	0	920.02
01-Aug-2009 to 31-Aug-2009	416.81	0	0	416.81
01-Sep-2009 to 30-Sep-2009	340.73	0	0	340.73
01-Sep-2009 to 31-Sep-2009	258.83	0	0	258.83
01-Nov-2009 to 30-Nov-2009	194.41	0	0	194.41

	01-Dec-2009 to 31-Dec-2009	223.01	0	0	223.01	
	01-Jan-2010 to 31-Jan-2010	113.51	0	0	113.51	
	01-Feb-2010 to 28-Feb-2010	80.27	0	0	80.27	
	01-Mar-2010 to 31-Mar-2010	126.08	0	0	126.08	
	01-Apr-2010 to 30-Apr-2010	178.32	0	0	178.32	
	01-May-2010 to 31-May-2010	371.03	0	0	371.03	
	01-Jun-2010 to 30-Jun-2010	489.17	0	0	489.17	
	01-July-2010 to 31-July-2010	561.33	0	0	561.33	
	01-Aug-2010 to 31-Aug-2010	442.77	0	0	442.77	
	01-Sep-2010 to 30-Sep-2010	284.31	0	0	284.31	
	01-Oct-2010 to 31-Oct-2010	185.55	0	0	185.55	
	01-Nov-2010 to 30-Nov-2010	93.45	0	0	93.45	
	01-Dec-2010 to 31-Dec-2010	161.00	0	0	161.00	
	01-Jan-2011 to 31-Jan-2011	198.68	0	0	198.68	
	01-Feb-2011 to 28-Feb-2011	178.54	0	0	178.54	
	01-Mar-2011 to 31-Mar-2011	167.76	0	0	167.76	
	01-Apr-2011 to 30-Apr-2011	147.73	0	0	147.73	
	01-May-2011 to 31-May-2011	322.97	0	0	322.97	
	01-Jun-2011 to 30-Jun-2011	645.50	0	0	645.50	
	01-July-2011 to 31-July-2011	733.05	0	0	733.05	
	01-Aug-2011 to 31-Aug-2011	561.79	0	0	561.79	
	01-Sep-2011 to 30-Sep-2011	399.43	0	0	399.43	
	01-Oct-2011 to 31-Oct-2011	107.27	0	0	107.27	
	01-Nov-2011 to 30-Nov-2011	275.44	0	0	275.44	
	01-Dec-2011 to 31-Dec-2011	253.41	0	0	253.41	
	01-Jan-2012 to 31-Jan-2012	96.68	0	0	96.68	
	01-Feb-2012 to 29-Feb-2012	179.02	0	0	179.02	

01-Mar-2012 to 31-Mar-2012	145.09	0	0	145.09
Total	11011.13	0	0	11011.13

Total Emission Reductions for the monitoring Period are 11,011 tCO2e (rounded down value).

E.5. Comparison of actual emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Item	Values estimated in ex-ante calculation of registered PDD	Actual values achieved during this monitoring period	Item	Values estimated in ex-ante calculation of registered PDD
Emission reductions or GHG removals by sinks (t CO_2e)	16,081.2 (for the monitoring period) (5,360.4 per annum)	11,011	-	-

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

>> The estimated emission reduction for 36 months based on apportionment is:

Emission reduction estimated for 12 months period : 5,360 tCO_2e,
Proportionate for 36 months period will be : 16,081 tCO_2e
Actual Emission reductions for 36 months period : 11,011 tCO_2e

The difference is due to

1 .The change in wind pattern, the PLF achieved is lower than expected (Actual average PLF achieved is only 18.51%).

E.7. Actual emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Item	Actual values achieved up to 31 December 2012	Actual values achieved from 1 January 2013 onwards
Emission reductions or GHG removals by sinks (t CO_2e)	11,011 tCO_2e (monitoring period which starts from 01/04/2009 to 31/03/2012(Both days included))	Not applicable

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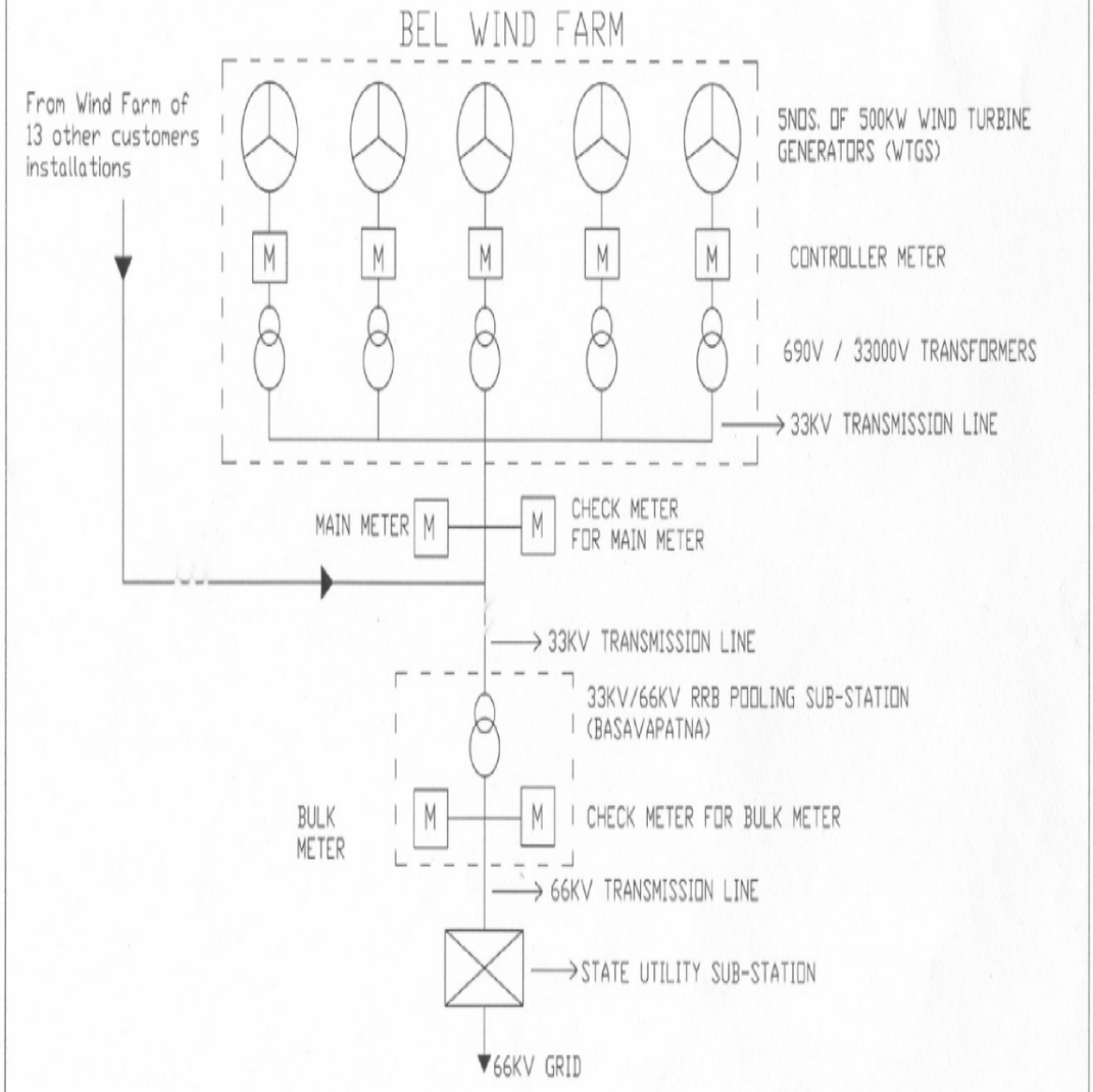
Document information

Version	*Date*	*Description*
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net anthropogenic GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	28 May 2010	EB 54, Annex 34. Initial adoption.

Decision Class: Regulatory
Document Type: Form
Business Function: issuance
Keywords: monitoring report, performance monitoring

APPENDIX-I


BEL WIND FARM
From Wind Farm of 13 other customers installations
5NOS. OF 500KW WIND TURBINE GENERATORS (WTGS)
M
CONTROLLER METER
690V / 33000V TRANSFORMERS
33KV TRANSMISSION LINE
MAIN METER
CHECK METER FOR MAIN METER
33KV TRANSMISSION LINE
33KV/66KV RRB POOLING SUB-STATION (BASAVAPATNA)
BULK METER
CHECK METER FOR BULK METER
66KV TRANSMISSION LINE
STATE UTILITY SUB-STATION
66KV GRID