Monitoring report form (Version 03.1)

Monitoring report

Title of the project activity	50.4 MW wind power project by EN Renewable Energy Pvt. Ltd
Reference number of the project activity	4364
Version number of the monitoring report	1.0
Completion date of the monitoring report	12/03/2013
Registration date of the project activity	21/03/2011
Monitoring period number and duration of this monitoring period	Second Monitoring Period 01/10/2011 to 31/12/2012 (including first and last day)
Project participant(s)	1.EN Renewable Energy Limited (Private Entity) 2.Kingdom of Spain (Spain) 3.Swedish Energy Agency (Sweden)
Host Party(ies)	India
Sectoral scope(s) and applied methodology(ies)	Sectoral Scope: 1, Energy industries (renewable / non-renewable sources) Methodology applied: Approved monitoring methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 12.3.0
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	132,053 tonnes of CO2e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	102,598 tonnes of CO2e

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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

EN Renewable Energy Limited ("ENRE") has installed 50.4 MW wind farm in the state of Karnataka in India. 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.

Enercon (India) Limited ("Enercon") is equipment supplier and the operations and maintenance contractor for the project activity. The project activity is owned by ENRE and Enercon is having the responsibility of operation and maintenance of the wind farm. The generated electricity will be supplied to Electricity Distribution Company (DISCOM) under a long-term power purchase agreement (PPA). The expected operational lifetime of the project is for 20 years.

Brief description of the installed technology and equipment:

The project activity involves 63-wind energy converters (WECs) of Enercon make (800 kW E-53) with internal electrical lines connecting the project activity with local evacuation facility. The average life time of the WEC is around 20 years as per the industry standards. The salient features of the state-of-art-technology are described in section B.1.

Relevant dates for the project activity:

The first machine under the project activity was commissioned on 16th February 2011 and the last machine under the project activity was commissioned on 31st March 2011. The project activity consists of 63-wind energy converters (WECs) of Enercon make (E-53) 800 kW each totalling to the capacity of 50.4 MW. The expected operational lifetime of the project is for 20 years. This is the second monitoring report for the project activity. The total emission reductions achieved under the monitoring period 01/10/2011 to 31/12/2012 (including first and last day) is 102,598 tCO2e. The details of issuance of CERs for the previous monitoring periods are as follows:

Monitoring Period No.	Monitoring Period	CER Requested
First Issuance	01/04/2011 to 30/09/2011 (Inclusive of both days)	56,413

Total emission reductions achieved in this monitoring period

This is the second monitoring report for the project activity. The total emission reductions achieved under the monitoring period from 01/10/2011 to 31/12/2012 (including first and last day) is 102,598 tCO2e.

A.2. Location of project activity

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The Project is spread across Sunahatti, Ganginahal, Kakti, Kanabargi, Baramanhatti, Nandi and Deshnur villages in Bailhongal and Belgaum Taluk of Belgaum District of Karnataka state in India. Nearest airport and railway station are at Belgaum.

The detailed individual WECs location numbers and coordinates of project activity are provided in Appendix 1.

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)	EN Renewable Energy Limited (Private Entity)	No
Spain	Kingdom of Spain	Yes
Sweden	Swedish Energy Agency	Yes

A.4. Reference of applied methodology

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Title: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"
Version: 12.3.0

Validity: Valid from 17 Sep 2010 to 10 May 2012

ACM0002 draws upon the following tools which have been used in the PDD:

- Tool to calculate the emission factor for an electricity system – Version 02
- Tool for the demonstration and assessment of additionality – Version 5.2

References:

http://cdm.unfccc.int/methodologies/DB/UB3431UT9I5KN2MUL2FGZXZ6CV71LT

http://cdm.unfccc.int/methodologies/PAmethodologies/tools

A.5. Crediting period of project activity

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The length of the Crediting period of the project activity as per registered PDD is 7 years (Renewable) starting from 01/04/2011 to 31/03/2018. This is second CER verification for the monitoring period 01/10/2011 to 31/12/2012 (including first and last day). There are no post-registration changes to the crediting period of the project activity.

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

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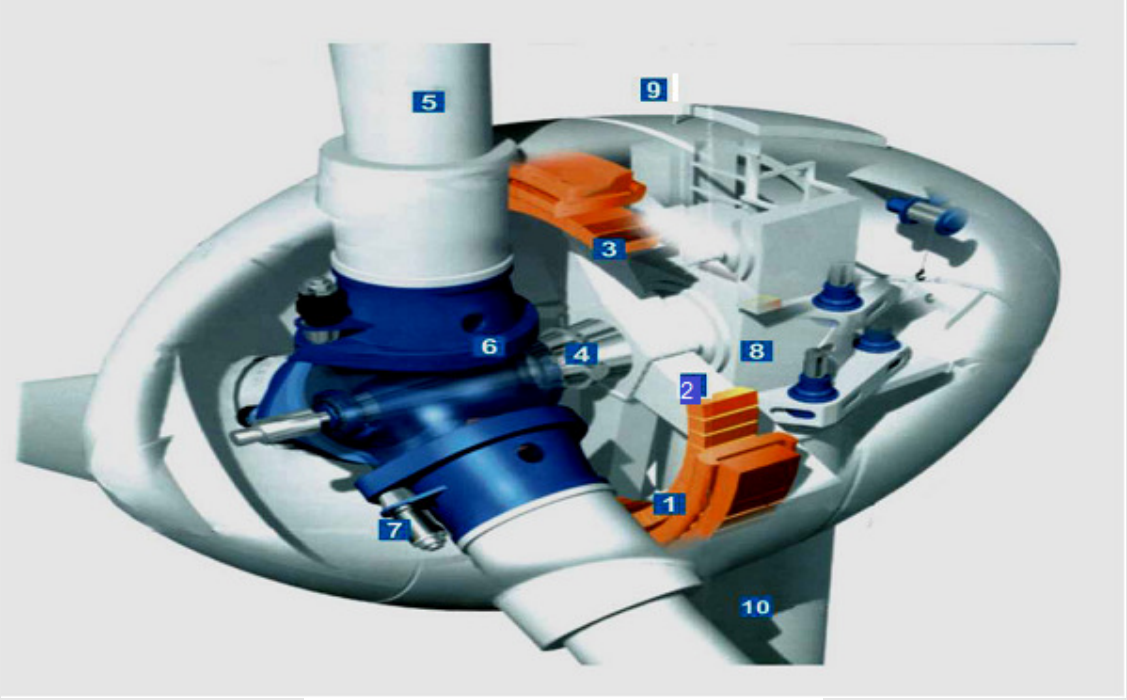
The first machine under the project activity was commissioned on 16th February, 2011 and the last machine under the project activity was commissioned on 31st March, 2011. During the monitoring period the project activity was operated and monitored in accordance with the applicable baseline and monitoring methodology ACM0002 (Version 12.3.0) and registered PDD.

The project activity involves 63-wind energy converters (WECs) of Enercon make (800 kW E-53) with internal electrical lines connecting the project activity with local evacuation facility. The WECs generates 3-phase power at 400V, which is stepped up to 33 KV. The project activity can operate in the frequency range of 47.5–51.5 Hz and in the voltage range of 400 V ± 12.5%. The average life time of the WEC is around 20 years as per the industry standards. 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	53 m
Hub height	75 m
Turbine Type	Gearless horizontal axis wind turbine with variable rotor speed
Power regulation	Independent electromechanical pitch system for each blade.
Cutin windspeed	2.5 *m/s*
Rated wind speed	12 *m/s*
Cutout Windspeed	28-34 m/s
Extreme Wind Speed	59.5 *m/s*
Rated rotational speed	32 rpm
Operating range rot. speed	12-29 rpm
Orientation	Upwind
No of Blades	3
Blade Material	Glass Fibre reinforced Epoxy
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 and friction bearing
Tower	74 m concrete

Enercon (India) Ltd 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.



1. Generator
2. Generator Stator
3. Generator Rotor
4. Main Pin
5. Rotor Blade
6. Blade Flange
7. Pitch Drive
8. Main Carrier
9. Wind Sensor
10. Tower

Enercon E-53 Technology Diagram

The commissioning schedule of all the WECs under the project activity has been provided in Appendix 2.

There are no changes that have happened in project activity which may impact the applicability of the methodology. Enercon operation and maintenance activities are 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. 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. Post registration changes

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

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No deviations have been there in the applied methodology.

B.2.2. Corrections

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There are no corrections from the registered PDD during this monitoring period.

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

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There are no permanent changes from registered monitoring plan or applied methodology during this monitoring period.

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

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There are no changes to project design of the registered project activity.

B.2.5. Changes to start date of crediting period

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There are no changes to the start date of the crediting period.

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

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Not applicable to the project activity.

SECTION C. Description of monitoring system

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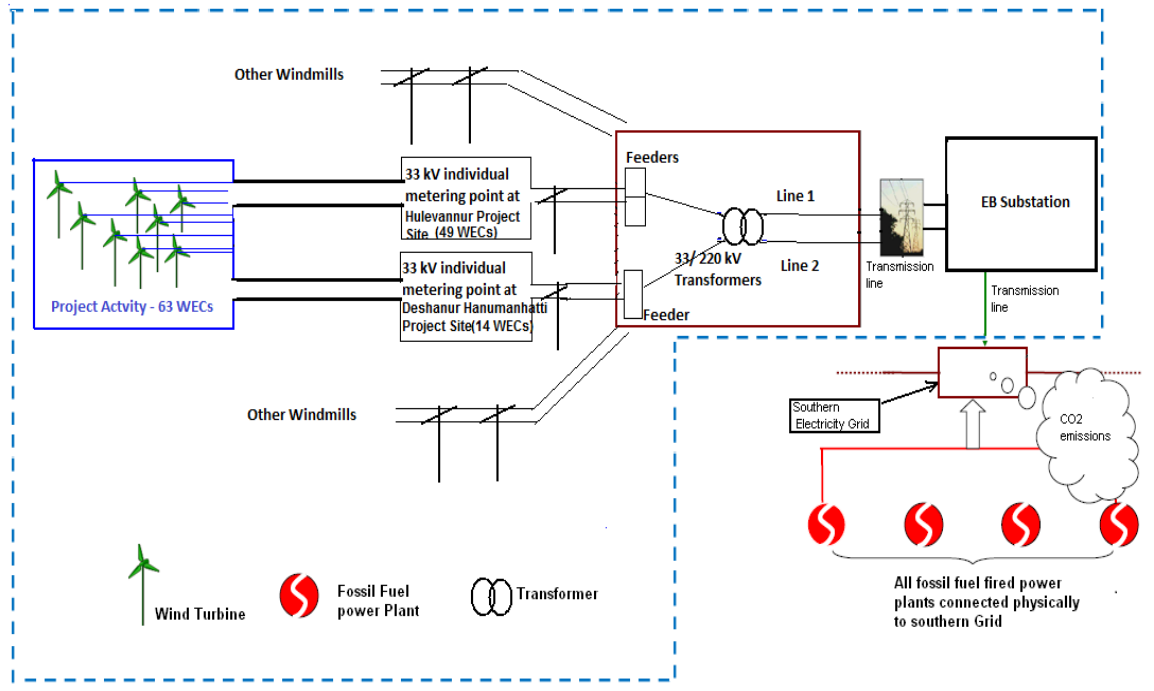
Approved monitoring methodology ACM0002 Version 12.3.0 Sectoral Scope: 1, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", by CDM - Meth Panel is proposed to be used to monitor the emission reductions.

Monitoring System of Project activity:

A detailed line diagram of project activity is shown in below picture. From the below picture it is clear that the electricity supplied to the grid will be metered at two 33 kV metering point, where billing is to be done by Electricity Board officials on monthly basis. Output of feeder lines at both 33 kV metering points is step up to 220 kV using step up transformer. Output of transformer is connected to 220 kV Electricity Board substation. From 220 kV Electricity Board sub-station electricity is supplied to southern electricity grid.



Metering:

The project activity has two metering point at 33 kV located in different project site and is connected to 220 kV common electricity board substation. The meter reading is taken in the presence of representatives of Enercon (O&M Contractor for the project activity) and State Utility. Electricity delivered by all these WECs are metered at 33 kV metering point in the form of JMR (Form B) and is signed by the representatives of Enercon and State Utility. The meter readings (both export and import), transmission loss and net electricity exported to the grid are noted in the JMR. The common metering point at 220 kV substation comprises main meters and check meters. Transmission loss between metering point feeding at 33 kV and the metering point at 220 kV Electricity Board substation/switching station is applied to the meter reading taken at 33 kV individual metering point.

Transmission losses are 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 63 turbines and feeding to pooling substation of Enercon. 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/Switching substation)
4. Net Electricity exported to the Grid [Electricity Export-115%*Electricity Import-Transmission Loss]

EG_y for the project activity is derived as follows:-

$EG_y = Gpe - 115\% * Gpi - Li$
EG_y : Net Electricity supplied to grid by the project activity
Gpe: Electricity Export recorded at the meter(s) connected 63 machines of the project activity
Gpi: Electricity Import recorded at the meter(s) connected 63 machines of the project activity.
Li : Transmission loss

Transmission loss is certified by the state utility in JMR. Transmission Loss has directly applied from the joint meter report (Form B) for the project activity as better described under section D.2. However, State utility calculates transmission loss as follows:

L : $\sum_i$ G*j* – N
Li : G*p* *(L/$\sum$G*j)*

$\sum_i$ G*j* : Summation of electricity generation data measured at all the feeders connected to pooling substation
N : Electricity generation data measured at Switching station/Substation at Belgaum from the feeders emanating from the pooling substation
G*p* : Generation of electricity by the project activity recorded at the feeder connected to 63 turbines of the project activity
L : Total transmission loss

Monthly Meter Readings:

The electricity supplied to the grid is recorded by taking a Joint Meter Reading (JMR) in the presence of Officials from the State Utility and Enercon, O&M contractor, on behalf of project owner on the first day of every month. Monthly electricity generation supplied to the grid is recorded continuously for period of one month commencing from 00.00 hours on the first day and ending at 24.00 hours on last day of every month. The Joint meter reading contains the value of energy imported and exported. These certified readings are then used by the DISCOM officials to prepare the tariff invoices. Thus the monitoring parameters for the project activity are the electricity import and electricity export to the grid as mentioned in the JMR. The readings are then adjusted for the transmission loss in the JMR, which can be crosschecked with the value mentioned in the invoices.

Metering Equipments:

Metering system for the project activity consists of main and check meter. Both the meters are two-way trivector meters capable of recording import and export of electricity. The metering equipment is calibrated annually. All main and check energy meters (export and import) 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 accredited representatives.

Meter Test Checking:

The meter is tested for accuracy with reference to a portable standard meter. The Main and Check Meters are close to each other and will be tested for accuracy, with a standard meter, by the discom testing Division. The meter is deemed to be working satisfactorily if the errors are within specifications for meters of 0.2 accuracy classes. The consumption registered by the meter alone holds good for the purpose of metering electricity supplied to the grid as long as the error in the meter is within the permissible limits.
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.
- If 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 last test.
- 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 0.2% 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.

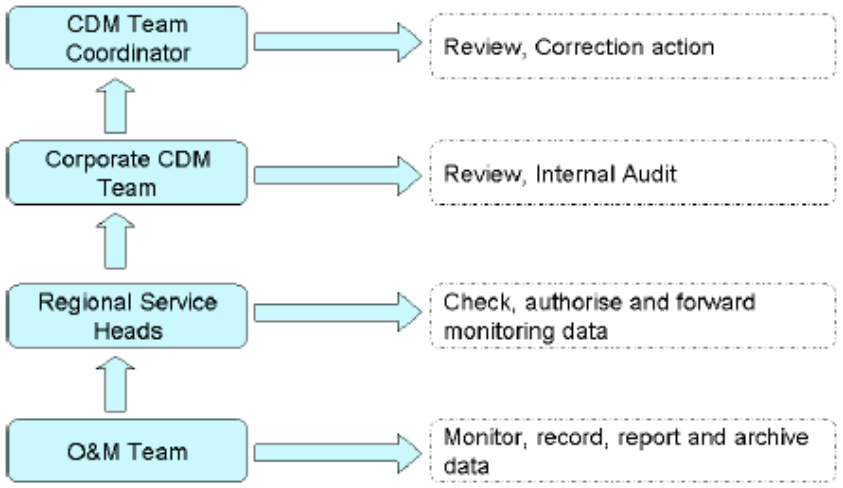
QA/QC Procedures:
The Project is operated and managed by ENRE. The operational and maintenance contract for the project is with Enercon. Enercon is an ISO 9001:2000 certified Quality Management system from Germanischer Lloyd. Enercon follows the documentation practices to ensure the reliability and availability 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. 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.

Monitoring roles and responsibilities

The operational and maintenance contract for the project is with Enercon. The operational and management structure implemented is as follows:



Calibration frequency:

The metering equipments were inspected & calibrated by state utility. Calibration details for the main and check meters are as follows:-

S. No.	Meter Type	Meter Sr. no.	Accuracy class	Calibration before monitoring period	Calibration during monitoring period	Calibration Due date
1	Main Meter	9142441	0.2	28-March-2011	24-January-2012	23-January-2013
2	Check Meter	9142578	0.2	28-March-2011	24-January-2012	23-January-2013
3	Main Meter	9142435	0.2	01-February-2011	20-January-2012	19-January-2013
4	Check Meter	9142603	0.2	01-February-2011	20-January-2012	19-January-2013

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 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.

SECTION D. Data and parameters

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

Data / Parameter:	$EF_{Grid, OM,y}$
Data unit:	tCO_2e/MWh
Description:	Operating Margin Emission Factor of Southern Regional Electricity Grid
Source of data used:	"CO_2 Baseline Database for Indian Power Sector", version 5 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/reports/planning/cdm_co2/cdm_co2.htm .
Value(s) applied:	0.98756*
Purpose of data:	Baseline Emissions
Additional comment:	None

Data / Parameter:	$EF_{Grid\ BM,y}$
Data unit:	tCO_2e/MWh
Description:	Build Margin Emission Factor of Southern Regional Electricity Grid
Source of data used:	"CO_2 Baseline Database for Indian Power Sector" version 5 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/reports/planning/cdm_co2/cdm_co2.htm
Value(s) applied:	0.81792
Purpose of data:	Baseline Emissions
Additional comment:	None

Data / Parameter:	EF_y **or** $EF_{Grid, CM,y}$
Data unit:	tCO_2e/MWh
Description:	Combined Margin Emission Factor of Southern Regional Electricity Grid
Source of data used:	"CO_2 Baseline Database for Indian Power Sector" version 5 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/reports/planning/cdm_co2/cdm_co2.htm
Value(s) applied:	0.94515 tCO_2e/MWh Please refer Appendix 3 for comprehensive calculation of Combined Margin Emission Factor.
Purpose of data:	Baseline Emissions
Additional comment:	This parameter is fixed and will remain same throughout the crediting period.

* The values of operating margin and build margin have been calculated up to five decimal places. These values have been mentioned up to five decimal places Annex 3 and up to four decimal points in section B.6.2 of the registered PDD. Emission reductions calculations are based on combined margin grid emission factor value which is consistent throughout the registered PDD; hence no impact on emission reduction calculations.

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:	Calculated as per formulas better described under section C.
Source of data:	Electricity supplied to the grid as per the joint meter report.
Value(s) of monitored parameter:	108552.670 MWh
Monitoring equipment:	Baseline Emissions

Measuring/ Reading/ Recording frequency:	The recording frequency is monthly. Calculations are based on procedure described in section C.
Calculation method (if applicable):	$EG_y = Gp - Li$ *Where* G*p* : [export (G*pe*) –115%* Import (G*pi*)] Li : G*p* *(L/∑G*j)* Please refer section C for details and description of the above variables.
QA/QC procedures:	QA/QC procedures are being implemented by state utility (Discom) pursuant to the provisions of the power purchase agreement and there will be no additional QA/QC procedures. Please refer Section C for an illustration of the provisions for QA/QC procedures. The value of net electricity supplied to grid is calculated by continuous measurement of export, import parameter and can be cross checked from the invoices raised to the state utility.
Purpose of data:	Baseline Emissions calculations
Additional comment:	None

Data / Parameter:	**G*pe***
Data unit:	MWh (Mega-Watt hour)
Description:	Electricity Export recorded at the meter(s) connected 63 machines of the project activity.
Measured /Calculated /Default:	Measured: The Export reading is jointly noted from the meter(s) installed at pooling substation of Enercon.
Source of data:	Electricity export to the grid as per the joint meter report. This value has been taken from the JMR (Form B) and will be applied directly.
Value(s) of monitored parameter:	110316.600 MWh
Monitoring equipment :	**For 14 WECs:** Type- Tri-vector Meter Accuracy Class-0.2 Main Meter Serial Number- 9142441 Check Meter Serial Number- 9142578 Last date of Test – 24/01/2012 Validity of Test- 23/01/2013 (one year) Frequency of Calibration- Annual **For 49 WECs:** Type- Tri-vector Meter Accuracy Class-0.2 Main Meter Serial Number- 9142435 Main Meter Serial Number- 9142603 Last date of Test – 20/01/2012 Validity of Test- 19/01/2013 (one year) Frequency of Calibration- Annual
Measuring/ Reading/ Recording frequency:	Continuous measurement, monthly recording. The reading is jointly noted by the representatives of state utility and Enercon.
Calculation method (if applicable):	NA
QA/QC procedures:	The meters will be calibrated once each year by the state utility. Refer Section C for an illustration of the provisions for QA/QC procedures.
Purpose of data	Baseline Emissions calculations
Additional comment	None

Data / Parameter:	**G*pi***
Data unit:	MWh (Mega-Watt hour)
Description:	Electricity Import recorded at the meter(s) connected 63 machines of the project activity.
Measured /Calculated /Default:	Measured: Electricity import to the grid has been recorded by the meter(s) connected to the 63 machines of the project activity feeding the pooling substation of Enercon.
Source of data:	Electricity import from the grid as per the joint meter report. This value

	has been taken from the JMR (Form B) and will be applied directly.
Value(s) of monitored parameter:	34.200 MWh
Monitoring equipment	**For 14 WECs:** Type- Tri-vector Meter Accuracy Class-0.2 Main Meter Serial Number- 9142441 Check Meter Serial Number- 9142578 Last date of Test – 24/01/2012 Validity of Test- 23/01/2013 (one year) Frequency of Calibration- Annual **For 49 WECs:** Type- Tri-vector Meter Accuracy Class-0.2 Main Meter Serial Number- 9142435 Main Meter Serial Number- 9142603 Last date of Test – 20/01/2012 Validity of Test- 19/01/2013 (one year) Frequency of Calibration- Annual
Measuring/ Reading/ Recording frequency:	Continuous measurement, monthly recording. The reading is jointly noted by the representatives of state utility and Enercon.
Calculation method (if applicable):	NA
QA/QC procedures:	The meters will be calibrated once each year by the state utility. Refer Section C for an illustration of the provisions for QA/QC procedures.
Purpose of data	Baseline Emissions calculations
Additional comment	None

Data / Parameter:	**L*i***
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/Switching Station.
Measured /Calculated /Default:	Calculated as per formulas better described under section C.
Source of data:	Transmission Loss has directly applied from the joint meter report (Form B) for the project activity. This value has been directly applied from the JMR (Form B).
Value(s) of monitored parameter:	1043.499 MWh
Monitoring equipment:	Calculated as per formulas better described under section C.
Measuring/ Reading/ Recording frequency:	Monthly. Calculations are based on procedure described in section C.
Calculation method (if applicable):	NA
QA/QC procedures applied:	The value is calculated. Please refer Section C for QA/QC procedures.
Purpose of data	Baseline Emissions calculations
Additional comment	None

D.3. Implementation of sampling plan

>>

Not applicable to the project activity.

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

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

>>

According to the approved methodology ACM0002 (Version 12.3.0) Baseline emissions are calculated as:-

$BE_y = EG_{PJ,y} * EF_{grid,CM,y}$
Where:
BE_y = Baseline emissions in year *y* (tCO_2e/yr)

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year *y* (MWh/yr)

$EF_{grid,CM,y}$ = Combined margin CO_2 emission factor for grid connected power generation in year *y* calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (tCO_2eMWh)

Since the project activity is the installation of a new grid connected renewable power plant the $EG_{PJ,y}$ is calculated as :

$EG_{PJ,y} = EG_{facilitv,y}$

Where:
$EG_{facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year *y* (MWh/yr)

Therefore, Baseline emissions calculation for the period 01/10/2011 to 31/12/2012 (including first and last day):
Baseline emissions (BE_y) = 108552.670 (MWh) * 0.94515 (tCO_2e/MWh)
= 102,598 tCO_2e

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 as per ACM0002, i.e. PEy = 0 tCO2e.

E.3. Calculation of leakage

>>
According to ACM0002, the leakage of the Project is considered as zero, i.e. Ly=0 tCO2e.

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 ($t CO_2e$)	Project emissions or actual net GHG removals by sinks ($t CO_2e$)	Leakage ($t CO_2e$)	Emission reductions or net anthropogenic GHG removals by sinks ($t CO_2e$)
Total	102,598	0	0	102,598

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

Item	Actual values achieved up to 31 December 2012	Actual values achieved from 1 January 2013 onwards
Emission reductions or GHG removals by sinks ($t CO_2e$)	132,053	102,598

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

>>

The estimated annual emission reductions as per the registered PDD corresponding to the current monitoring period are 132,053 tCO2e. The actual emission reductions are 102,598 which are 22.31 % less than the estimated emission reduction. The difference in the total CERs is due to low wind availability during the period leading to low plant load factor.

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)	102,598	0

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Document information

Version	*Date*	*Description*
03.1	2 January 2013	Editorial revision to correct table in section E.5.
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 1: Details of Physical Location of Project Activity

Sr. No.	Location Number	Village	Taluka	District	Latitude (N)	Longitude (E)
1	HH01	Deshnur	Bailhongal	Belgaum	15°55'50.9"	74°42'2.9"
2	HH02	Deshnur	Bailhongal	Belgaum	15°55'56.6"	74°42'1.3"
3	HH03	Deshnur	Bailhongal	Belgaum	15°56'5.8"	74°42'2.3"
4	HH04	Deshnur	Bailhongal	Belgaum	15°56'10.9"	74°42'0.3"
5	HH06	Deshnur	Bailhongal	Belgaum	15°56'15"	74°42'31.4"
6	HH07	Deshnur	Bailhongal	Belgaum	15°56'21"	74°42'31.2"
7	HH08	Deshnur	Bailhongal	Belgaum	15°56'27.6"	74°42'26.6"
8	HH11	Deshnur	Bailhongal	Belgaum	15°56'35.4"	74°42'36.8"
9	HH12	Deshnur	Bailhongal	Belgaum	15°56'41.3"	74°42'35.5"
10	HH13	Deshnur	Bailhongal	Belgaum	15°56'47.7"	74°42'35.5"
11	HH14	Deshnur	Bailhongal	Belgaum	15°56'53.9"	74°42'36.2"
12	HH15	Deshnur	Bailhongal	Belgaum	15°56'58.2"	74°42'18.8"
13	HH16	Deshnur	Bailhongal	Belgaum	15°57'2.8"	74°42'13.7"
14	HH17	Deshnur	Bailhongal	Belgaum	15°57'15.6"	74°43'5.0"
15	H1	Ganginahal	Belgaum	Belgaum	15°57'26.4"	74°32'44.3"
16	H2	Kakti	Belgaum	Belgaum	15°57'20.1"	74°32'44.2"
17	H3	Kakti	Belgaum	Belgaum	15°57'13.6"	74°32'42.7"
18	H4	Kakti	Belgaum	Belgaum	15°57'4.5"	74°32'39.6"
19	H5	Sunahatti	Belgaum	Belgaum	15°56'57.6"	74°32'42.7"
20	H6	Sunahatti	Belgaum	Belgaum	15°56'51.5"	74°32'44.3"
21	H7	Sunahatti	Belgaum	Belgaum	15°56'44.6"	74°32'43.3"
22	H8	Kakti	Belgaum	Belgaum	15°56'38"	74°32'38.1"
23	H9	Kakti	Belgaum	Belgaum	15°56'30.9"	74°32'38.3"
24	H10	Kakti	Belgaum	Belgaum	15°56'58.1"	74°31'55.5"
25	H11	Kakti	Belgaum	Belgaum	15°56'37.4"	74°32'2.5"
26	H12	Kakti	Belgaum	Belgaum	15°56'31.9"	74°32'7.4"
27	H13	Kakti	Belgaum	Belgaum	15°56'24.2"	74°32'30.9"
28	H14	Kakti	Belgaum	Belgaum	15°56'17.8"	74°32'30.4"
29	H15	Kakti	Belgaum	Belgaum	15°56'12.2"	74°32'33.7"
30	H16	Kakti	Belgaum	Belgaum	15°56'14.5"	74°32'1.4"
31	H17	Kakti	Belgaum	Belgaum	15°56'4.1"	74°32'19.1"
32	H18	Kakti	Belgaum	Belgaum	15°55'58.2"	74°32'20.9"
33	H19	Kakti	Belgaum	Belgaum	15°55'53"	74°32'24.4"
34	H20	Kakti	Belgaum	Belgaum	15°55'47.5"	74°32'29.4"
35	H21	Kakti	Belgaum	Belgaum	15°55'38.3"	74°32'32.7"
36	H22	Kakti	Belgaum	Belgaum	15°55'36.7"	74°32'15.8"
37	H23	Kakti	Belgaum	Belgaum	15°55'41.9"	74°32'10.9"
38	H24	Kakti	Belgaum	Belgaum	15°55'40"	74°33'20.6"
39	H27	Kanabargi	Belgaum	Belgaum	15°55'24.7"	74°33'47.1"
40	H28	Kanabargi	Belgaum	Belgaum	15°55'57.2"	74°34'39.6"
41	H41	Baramanahatti	Belgaum	Belgaum	15°56'20"	74°35'6.3"
42	H42	Baramanahatti	Belgaum	Belgaum	15°56'26.6"	74°34'54.8"
43	H43	Baramanahatti	Belgaum	Belgaum	15°56'32.7"	74°34'46.1"
44	H44	Baramanahatti	Belgaum	Belgaum	15°56'38.2"	74°34'42.1"
45	H45	Baramanahatti	Belgaum	Belgaum	15°56'46.1"	74°34'40.5"
46	H46	Baramanahatti	Belgaum	Belgaum	15°56'53.4"	74°34'38.4"
47	H47	Baramanahatti	Belgaum	Belgaum	15°56'46.9"	74°34'19.4"
48	H48	Baramanahatti	Belgaum	Belgaum	15°56'52.8"	74°34'17.7"
49	H49	Nandi	Belgaum	Belgaum	15°56'60"	74°34'19.3"
50	H50	Nandi	Belgaum	Belgaum	15°57'6.6"	74°34'21"
51	H51	Nandi	Belgaum	Belgaum	15°57'12.8"	74°34'21.1"
52	H52	Nandi	Belgaum	Belgaum	15°57'19.9"	74°34'22.8"
53	H53	Nandi	Belgaum	Belgaum	15°57'26.3"	74°34'23.6"
54	H54	Nandi	Belgaum	Belgaum	15°57'33.3"	74°34'25.2"
55	H55	Nandi	Belgaum	Belgaum	15°57'41.3"	74°34'28.5"
56	H56	Nandi	Belgaum	Belgaum	15°57'48.1"	74°34'30.1"

57	H57	Nandi	Belgaum	Belgaum	15°57'54.5"	74°34'30.4"
58	H58	Nandi	Belgaum	Belgaum	15°57'34.2"	74°35'8"
59	H59	Nandi	Belgaum	Belgaum	15°57'27.7"	74°35'7.3"
60	H60	Baramanahatti	Belgaum	Belgaum	15°57'21.9"	74°35'9.5"
61	H61	Baramanahatti	Belgaum	Belgaum	15°57'11.8"	74°35'21"
62	H62	Baramanahatti	Belgaum	Belgaum	15°57'24.5"	74°35'25.6"
63	H63	Nandi	Belgaum	Belgaum	15°57'31.3"	74°35'26.5"

APPENDIX 2: COMMISSIONING SCHEDULE

SN	Name	Capacity	Village	Taluka	District	Location Number	Commissioning Date
1	EN Renewable Energy Limited	800 kW	Deshnur	Bailhongal	Belgaum	HH01	31.03.2011
2		800 kW	Deshnur	Bailhongal	Belgaum	HH02	31.03.2011
3		800 kW	Deshnur	Bailhongal	Belgaum	HH03	31.03.2011
4		800 kW	Deshnur	Bailhongal	Belgaum	HH04	31.03.2011
5		800 kW	Deshnur	Bailhongal	Belgaum	HH06	31.03.2011
6		800 kW	Deshnur	Bailhongal	Belgaum	HH07	31.03.2011
7		800 kW	Deshnur	Bailhongal	Belgaum	HH08	31.03.2011
8		800 kW	Deshnur	Bailhongal	Belgaum	HH11	31.03.2011
9		800 kW	Deshnur	Bailhongal	Belgaum	HH12	31.03.2011
10		800 kW	Deshnur	Bailhongal	Belgaum	HH13	31.03.2011
11		800 kW	Deshnur	Bailhongal	Belgaum	HH14	31.03.2011
12		800 kW	Deshnur	Bailhongal	Belgaum	HH15	31.03.2011
13		800 kW	Deshnur	Bailhongal	Belgaum	HH16	31.03.2011
14		800 kW	Deshnur	Bailhongal	Belgaum	HH17	31.03.2011
15		800 kW	Ganginahal	Belgaum	Belgaum	H1	16.02.2011
16		800 kW	Kakti	Belgaum	Belgaum	H2	16.02.2011
17		800 kW	Kakti	Belgaum	Belgaum	H3	16.02.2011
18		800 kW	Kakti	Belgaum	Belgaum	H4	16.02.2011
19		800 kW	Sunahatti	Belgaum	Belgaum	H5	16.02.2011
20		800 kW	Sunahatti	Belgaum	Belgaum	H6	16.02.2011
21		800 kW	Sunahatti	Belgaum	Belgaum	H7	16.02.2011
22		800 kW	Kakti	Belgaum	Belgaum	H8	16.02.2011
23		800 kW	Kakti	Belgaum	Belgaum	H9	16.02.2011
24		800 kW	Kakti	Belgaum	Belgaum	H10	16.02.2011
25		800 kW	Kakti	Belgaum	Belgaum	H11	16.02.2011
26		800 kW	Kakti	Belgaum	Belgaum	H12	16.02.2011
27		800 kW	Kakti	Belgaum	Belgaum	H13	16.02.2011
28		800 kW	Kakti	Belgaum	Belgaum	H14	16.02.2011
29		800 kW	Kakti	Belgaum	Belgaum	H15	16.02.2011
30		800 kW	Kakti	Belgaum	Belgaum	H16	16.02.2011
31		800 kW	Kakti	Belgaum	Belgaum	H17	16.02.2011
32		800 kW	Kakti	Belgaum	Belgaum	H18	16.02.2011
33		800 kW	Kakti	Belgaum	Belgaum	H19	16.02.2011
34		800 kW	Kakti	Belgaum	Belgaum	H20	16.02.2011
35		800 kW	Kakti	Belgaum	Belgaum	H21	16.02.2011
36		800 kW	Kakti	Belgaum	Belgaum	H22	16.02.2011
37		800 kW	Kakti	Belgaum	Belgaum	H23	16.02.2011
38		800 kW	Kakti	Belgaum	Belgaum	H24	16.02.2011
39		800 kW	Kanabargi	Belgaum	Belgaum	H27	16.02.2011
40		800 kW	Kanabargi	Belgaum	Belgaum	H28	31.03.2011
41		800 kW	Baramanahatti	Belgaum	Belgaum	H41	16.02.2011

42		800 kW	Baramanahatti	Belgaum	Belgaum	H42	16.02.2011
43		800 kW	Baramanahatti	Belgaum	Belgaum	H43	16.02.2011
44		800 kW	Baramanahatti	Belgaum	Belgaum	H44	16.02.2011
45		800 kW	Baramanahatti	Belgaum	Belgaum	H45	16.02.2011
46		800 kW	Baramanahatti	Belgaum	Belgaum	H46	11.03.2011
47		800 kW	Baramanahatti	Belgaum	Belgaum	H47	11.03.2011
48		800 kW	Baramanahatti	Belgaum	Belgaum	H48	11.03.2011
49		800 kW	Nandi	Belgaum	Belgaum	H49	11.03.2011
50		800 kW	Nandi	Belgaum	Belgaum	H50	11.03.2011
51		800 kW	Nandi	Belgaum	Belgaum	H51	11.03.2011
52		800 kW	Nandi	Belgaum	Belgaum	H52	11.03.2011
53		800 kW	Nandi	Belgaum	Belgaum	H53	11.03.2011
54		800 kW	Nandi	Belgaum	Belgaum	H54	11.03.2011
55		800 kW	Nandi	Belgaum	Belgaum	H55	11.03.2011
56		800 kW	Nandi	Belgaum	Belgaum	H56	11.03.2011
57		800 kW	Nandi	Belgaum	Belgaum	H57	11.03.2011
58		800 kW	Nandi	Belgaum	Belgaum	H58	11.03.2011
59		800 kW	Nandi	Belgaum	Belgaum	H59	31.03.2011
60		800 kW	Baramanahatti	Belgaum	Belgaum	H60	11.03.2011
61		800 kW	Baramanahatti	Belgaum	Belgaum	H61	11.03.2011
62		800 kW	Baramanahatti	Belgaum	Belgaum	H62	31.03.2011
63		800 kW	Nandi	Belgaum	Belgaum	H63	31.03.2011

Appendix 3: BASELINE INFORMATION

The Operating Margin data for the most recent three years and the Build Margin data for the Southern Region Electricity Grid as published in the CEA database are as follows:

Simple Operating Margin

	Southern Grid (tCO_2e/MWh)
Simple Operating Margin – 2006-07	0.99912
Simple Operating Margin – 2007-08	0.99062
Simple Operating Margin – 2008-09	0.97293
Average Operating Margin of last three years	0.98756

Build Margin

	Southern Grid (tCO_2e/MWh)
Build Margin- 2008-09	0.81792

Combined Margin Calculations

	Weights	Southern Grid (tCO_2e/MWh)
Operating Margin	0.75	0.98756
Build Margin	0.25	0.81792
Combined Margin		0.94515

Detailed information on calculation of operating margin emission factor and build margin emission factor is available at www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm .

Appendix 4: Net Electricity Exported to Grid (EG_Y)

					Net Electricity Supplied to Grid (MWh)	Electricity Generation (MWh)	Electricity Export (MWh)	Electricity Import (MWh)	Transmission Loss (MWh)
Month	**Name**	**R. R. Serial No.**	**No. of M/C**	**Capacity (MW)**	**EGy=Gp – Li**	**Gp = export (Gpe) – 115%* Import (Gpi)**	**Gpe**	**EG*pi***	**Li**
October-2011	EN Renewable Energy Limited	R. R. No. 6	49	39.2	3233.502	3270.855	3278.100	6.300	37.353
		R. R. No. 7	14	11.2	1069.873	1082.220	1083.600	1.200	12.347
November-2011	EN Renewable Energy Limited	R. R. No. 6	49	39.2	6651.120	6761.685	6764.100	2.100	110.565
		R. R. No. 7	14	11.2	2161.775	2197.710	2198.400	0.600	35.935
December-2011	EN Renewable Energy Limited	R. R. No. 6	49	39.2	4695.113	4756.500	4756.500	0.000	61.387
		R. R. No. 7	14	11.2	1568.887	1589.400	1589.400	0.000	20.513
January-2012	EN Renewable Energy Limited	R. R. No. 6	49	39.2	2214.615	2257.500	2257.500	0.000	42.885
		R. R. No. 7	14	11.2	713.385	727.200	727.200	0.000	13.815
February-2012	EN Renewable Energy Limited	R. R. No. 6	49	39.2	2868.707	2914.800	2914.800	0.000	46.093
		R. R. No. 7	14	11.2	915.293	930.000	930.000	0.000	14.707
March-2012	EN Renewable Energy Limited	R. R. No. 6	49	39.2	2756.207	2809.800	2809.800	0.000	53.593
		R. R. No. 7	14	11.2	699.793	713.400	713.400	0.000	13.607
April-2012	EN Renewable Energy Limited	R. R. No. 6	49	39.2	3138.807	3197.670	3202.500	4.200	58.863
		R. R. No. 7	14	11.2	758.293	772.530	774.600	1.800	14.237
May-2012	EN Renewable Energy Limited	R. R. No. 6	49	39.2	5464.905	5541.585	5544.000	2.100	76.680
		R. R. No. 7	14	11.2	1219.990	1237.110	1237.800	0.600	17.120
June-2012	EN Renewable Energy Limited	R. R. No. 6	49	39.2	9735.542	9888.900	9888.900	0.000	153.358
		R. R. No. 7	14	11.2	2623.768	2665.110	2665.800	0.600	41.342
July-2012	EN Renewable Energy Limited	R. R. No. 6	49	39.2	12983.792	13185.900	13185.900	0.000	202.108
		R. R. No. 7	14	11.2	3160.208	3209.400	3209.400	0.000	49.192
August-2012	EN Renewable Energy Limited	R. R. No. 6	49	39.2	11174.340	11354.700	11354.700	0.000	180.360
		R. R. No. 7	14	11.2	3081.660	3131.400	3131.400	0.000	49.740
September-2012	EN Renewable Energy Limited	R. R. No. 6	49	39.2	7089.193	7213.185	7215.600	2.100	123.992
		R. R. No. 7	14	11.2	1876.392	1909.200	1909.200	0.000	32.808
October-2012	EN Renewable Energy Limited	R. R. No. 6	49	39.2	5133.986	5211.885	5214.300	2.100	77.899
		R. R. No. 7	14	11.2	1726.219	1752.420	1753.800	1.200	26.201
November-2012	EN Renewable Energy Limited	R. R. No. 6	49	39.2	2606.087	2653.770	2658.600	4.200	47.683
		R. R. No. 7	14	11.2	979.013	996.930	999.000	1.800	17.917
December-2012	EN Renewable Energy Limited	R. R. No. 6	49	39.2	4743.725	4766.685	4769.100	2.100	22.960
		R. R. No. 7	14	11.2	1508.480	1577.820	1579.200	1.200	69.340
	Total				**108552.670**	**110277.270**	**110316.600**	**34.200**	**1724.600**