



Monitoring report form (Version 03.2)

Monitoring report

Title of the project activity	50.4 MW Tata Wind Farm - in Maharashtra
Reference number of the project activity	2819
Version number of the monitoring report	01
Completion date of the monitoring report	05/06/2014
Registration date of the project activity	01/06/2010
Monitoring period number and duration of this monitoring period	04 (01/05/2013 – 31/05/2014; including first and last days of monitoring period.)
Project participant(s)	<ol style="list-style-type: none"> 1) M/s The Tata Power Company Limited 2) M/s Enercon (India) Limited. 3) Asian Development Bank, as Trustee of the Asia Pacific Carbon Fund (Spain) 4) Asian Development Bank, as Trustee of the Asia Pacific Carbon Fund (Sweden) 5) Asian Development Bank, as Trustee of the Future Carbon Fund (Sweden) 6) Swedish Energy Agency
Host Party(ies)	India
Sectoral scope(s) and applied methodology(ies)	Scope 1 - Energy industries (renewable/ non-renewable sources). Methodology : Consolidated baseline methodology for grid-connected electricity generation from renewable sources, ACM0002, version 09
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	90,073 tCO ₂ e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	112,521 tCO ₂ e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period up to 31 December 2012(if applicable)	0 tCO ₂ e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period from 1 January 2013 onwards (if applicable).	112,521 tCO ₂ e

SECTION A. Description of project activity**A.1. Purpose and general description of project activity**

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"The Tata Power Company Limited" is the project sponsor. The objective is development, design, engineering, procurement, finance, construction, operation and maintenance of "50.4 MW Tata Wind Farm - in Maharashtra" to provide reliable, renewable power to the Maharashtra state electricity grid which is part of the NEWNE electricity grid. The Project activity lead to reduced greenhouse gas emissions because it displaces electricity from fossil fuel based electricity generation plants.

The aggregate 50.4 MW project activity comprises of total 63 numbers wind energy generators, with each WEG having a capacity of 800 kW. Enercon (India) Ltd ("Enercon") is the equipment supplier and the operations and maintenance contractor for the Project. The Project harnesses renewable resources in the region, and thereby displacing non-renewable natural resources and thus leading to sustainable economic and environmental development. "The Tata Power Company Limited" has sponsored the Project. Project activity supplies the electricity to the Maharashtra state grid that forms part of the Western electricity grid which is part of NEWNE grid of India and this power would be consumed by the Distribution business of The Tata Power Company Limited.

The first WEG under the project activity was commissioned on 10 Mar 2007 and last WEG under the project activity was commissioned on 15 December 2007. The expected operational lifetime of the project is for 20 years. The total emission reductions achieved under this monitoring period (01 May 13 to 31 May 14) is 112,521 tCO₂

A.2. Location of project activity

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The Project consists of 63 numbers of E-48 WEGs of 800 kW each installed at Khandke site of Ahmednagar district of Maharashtra State in India. The longitude and latitude details of each of the wind mill are given in the table below:

WEG Sr. No.	Unique Identification Number	Location	Latitude	Longitude
1	TPCL-1	Agadgaon	N19° 10' 29.8"	E74° 50' 59.8"
2	TPCL-2		N19° 10' 37.9"	E74° 50' 54.2"
3	TPCL-3		N19° 10' 44.8"	E74° 50' 50.7"
4	TPCL-4		N19° 10' 41.0"	E74° 50' 38.7"
5	TPCL-5		N19° 10' 32.7"	E74° 50' 38.7"
6	TPCL-6		N19° 10' 24.5"	E74° 50' 30.4"
7	TPCL-7		N19° 10' 18.3"	E74° 50' 24.7"
8	TPCL-8		N19° 09' 41.6"	E74° 50' 43.5"
9	TPCL-9		N19° 09' 36.8"	E74° 51' 03.9"
10	TPCL-10		N19° 10' 07.1"	E74° 50' 36.2"
11	TPCL-11		N19° 09' 58.7"	E74° 50' 39.9"
12	TPCL-12		N19° 09' 49.8"	E74° 50' 41.6"
13	TPCL-13		N19° 09' 33.0"	E74° 50' 46.9"
14	TPCL-14		N19° 09' 22.4"	E74° 50' 37.7"
15	TPCL-15		N19° 09' 10.1"	E74° 50' 41.0"
16	TPCL-16		N19° 09' 01.1"	E74° 50' 44.4"
17	TPCL-17		N19° 08' 54.9"	E74° 50' 43.9"
18	TPCL-18		N19° 09' 56.7"	E74° 50' 07.0"
19	TPCL-19		N19° 10' 08.9"	E74° 50' 14.8"
20	TPCL-20	Rajani Deogaon	N19° 11' 07.7"	E74° 51' 41.8"
21	TPCL-21		N19° 11' 01.2"	E74° 51' 48.0"
22	TPCL-22		N19° 10' 54.1"	E74° 51' 52.7"
23	TPCL-23		N19° 10' 38.8"	E74° 51' 43.3"
24	TPCL-24		N19° 10' 31.6"	E74° 51' 43.6"
25	TPCL-25		N19° 10' 19.8"	E74° 51' 41.5"

26	TPCL-26		N19° 08' 51.1"	E74° 49' 37.4"
27	TPCL-27		N19° 08' 58.0"	E74° 49' 39.9"
28	TPCL-28		N19° 09' 04.4"	E74° 49' 36.5"
29	TPCL-29		N19° 09' 10.5"	E74° 49' 34.8"
30	TPCL-30		N19° 09' 37.2"	E74° 49' 46.3"
31	TPCL-31		N19° 08' 29.4"	E74° 49' 55.1"
32	TPCL-32		N19° 08' 21.5"	E74° 49' 52.7"
33	TPCL-33		N19° 08' 17.1"	E74° 49' 51.7"
34	TPCL-34		N19° 08' 06.1"	E74° 49' 59.9"
35	TPCL-35		N19° 06' 18.3"	E74° 53' 30.7"
36	TPCL-36		N19° 06' 30.0"	E74° 53' 21.7"
37	TPCL-37		N19° 06' 24.9"	E74° 53' 27.0"
38	TPCL-38	Agadgaon	N19° 06' 35.0"	E74° 53' 07.1"
39	TPCL-39		N19° 06' 42.2"	E74° 53' 06.4"
40	TPCL-40		N19° 06' 49.8"	E74° 53' 07.5"
41	TPCL-41		N19° 07' 02.2"	E74° 53' 02.2"
42	TPCL-42		N19° 07' 08.1"	E74° 52' 59.1"
43	TPCL-43		N19° 07' 16.0"	E74° 52' 59.1"
44	TPCL-44	Rajani Deogaon	N19° 09' 37.8"	E74° 53' 13.4"
45	TPCL-45		N19° 09' 30.0"	E74° 53' 13.9"
46	TPCL-46		N19° 10' 11.5"	E74° 53' 19.6"
47	TPCL-47		N19° 10' 18.1"	E74° 53' 06.8"
48	TPCL-48	Mehekari	N19° 10' 15.5"	E74° 52' 51.7"
49	TPCL-49		N19° 10' 20.6"	E74° 53' 19.1"
50	TPCL-50		N19° 10' 25.2"	E74° 53' 02.5"
51	TPCL-51		N19° 10' 21.1"	E74° 52' 44.9"
52	TPCL-52		N19° 10' 04.2"	E74° 53' 27.2"
53	TPCL-53		N19° 10' 16.5"	E74° 53' 32.5"
54	TPCL-54		N19° 10' 24.6"	E74° 53' 33.3"
55	TPCL-55		N19° 10' 32.9"	E74° 53' 33.5"
56	TPCL-56		N19° 09' 59.9"	E74° 53' 36.4"
57	TPCL-57		N19° 10' 50.1"	E74° 52' 23.4"
58	TPCL-58		N19° 10' 43.9"	E74° 52' 27.2"
59	TPCL-59		N19° 10' 59.4"	E74° 52' 21.1"
60	TPCL-60		N19° 10' 35.6"	E74° 52' 33.9"
61	TPCL-61		N19° 10' 28.5"	E74° 52' 41.4"
62	TPCL-62		N19° 10' 38.6"	E74° 52' 51.6"
63	TPCL-63	Rajani Deogaon	N19° 09' 47.1"	E74° 53' 18.3"

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 The Tata Power Company Limited (Private entity)	No
India (host)	M/s Enercon (India) Limited. (Private entity)	No
Spain	Asian Development Bank, as Trustee of the Asia Pacific Carbon Fund	Yes ¹

¹ This is to confirm that as per the project web-page at UNFCCC web-site under 'Other Parties Involved' section Spain is involved indirectly and only 'Kingdom of Spain' is mentioned as project participant, though as per the authorization letter of Spain 'Asian Development Bank, as Trustee of the Asia Pacific Carbon Fund' is also authorized as project participant for project activity and Spain wishes to be considered as project participant

Sweden	Asian Development Bank, as Trustee of the Asia Pacific Carbon Fund	Yes ²
Sweden	Asian Development Bank, as Trustee of the Future Carbon Fund	Yes
Sweden	Swedish Energy Agency	Yes

A.4. Reference of applied methodology

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Title: Consolidated methodology for grid-connected electricity generation from renewable sources

Reference: Approved consolidated baseline and monitoring methodology ACM0002 (Version 09, EB 45), effective from 27 February 2009.

UNFCCC web reference of methodology:

<http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html>

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

- Tool to calculate the emission factor for an electricity system – Version 01, EB 35
<http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v1.pdf>
- Tool for the demonstration and assessment of additionality – Version 5.2, EB 39
<http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v5.2.pdf>

A.5. Crediting period of project activity

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Type of crediting period : Fixed
Start date of crediting period : 01 June 2010
Length of crediting period : 10 years (fixed crediting period)

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

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The first WEG under the project activity was commissioned on 10 Mar 2007 and last WEG under the project activity was commissioned on 15 December 2007. The project activity consists of total 63 WEGs (800 KWH) of Enercon make E-48. The commissioning date for all the WEGs include in the project activity is given in the table below:

WEG Sr. No.	Unique identification Number	Commissioning Dates
1	TPCL-1	22-Mar-07
2	TPCL-2	10-Mar-07
3	TPCL-3	10-Mar-07
4	TPCL-4	10-Mar-07

² This is to confirm that as per the project web-page at UNFCCC web-site under 'Other Parties Involved' section Sweden is involved directly and 'Swedish Energy Agency' & 'Asian Development Bank, as Trustee of the Future Carbon Fund' are mentioned as project participants, though as per the authorization letter of Sweden 'Asian Development Bank, as Trustee of the Asia Pacific Carbon Fund' is also authorized as project participant for project activity and Sweden wishes to be considered as project participant.

5	TPCL-5	10-Mar-07
6	TPCL-6	10-Mar-07
7	TPCL-7	10-Mar-07
8	TPCL-8	10-Mar-07
9	TPCL-9	10-Mar-07
10	TPCL-10	10-Mar-07
11	TPCL-11	10-Mar-07
12	TPCL-12	10-Mar-07
13	TPCL-13	10-Mar-07
14	TPCL-14	10-Mar-07
15	TPCL-15	10-Mar-07
16	TPCL-16	10-Mar-07
17	TPCL-17	10-Mar-07
18	TPCL-18	29-Mar-07
19	TPCL-19	31-Mar-07
20	TPCL-20	22-Mar-07
21	TPCL-21	22-Mar-07
22	TPCL-22	22-Mar-07
23	TPCL-23	22-Mar-07
24	TPCL-24	22-Mar-07
25	TPCL-25	22-Mar-07
26	TPCL-26	22-Mar-07
27	TPCL-27	22-Mar-07
28	TPCL-28	22-Mar-07
29	TPCL-29	29-Mar-07
30	TPCL-30	22-Mar-07
31	TPCL-31	22-Mar-07
32	TPCL-32	22-Mar-07
33	TPCL-33	22-Mar-07
34	TPCL-34	22-Mar-07
35	TPCL-35	22-Mar-07
36	TPCL-36	22-Mar-07
37	TPCL-37	22-Mar-07
38	TPCL-38	29-Mar-07
39	TPCL-39	31-Mar-07
40	TPCL-40	29-Mar-07
41	TPCL-41	29-Mar-07
42	TPCL-42	29-Mar-07
43	TPCL-43	29-Mar-07
44	TPCL-44	29-Mar-07
45	TPCL-45	29-Mar-07
46	TPCL-46	29-Mar-07
47	TPCL-47	29-Mar-07
48	TPCL-48	10-Apr-07
49	TPCL-49	10-Apr-07
50	TPCL-50	10-Apr-07
51	TPCL-51	7-May-07
52	TPCL-52	10-Apr-07
53	TPCL-53	7-May-07
54	TPCL-54	7-May-07
55	TPCL-55	7-May-07
56	TPCL-56	7-May-07
57	TPCL-57	15-Dec-07
58	TPCL-58	15-Dec-07
59	TPCL-59	15-Dec-07
60	TPCL-60	15-Dec-07
61	TPCL-61	30-Nov-07
62	TPCL-62	30-Nov-07
63	TPCL-63	30-Nov-07

Enercon (India) Limited is the O & M contractor for the project activity and 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 WEGs that are included in the project activity. As a part of regular maintenance the WEGs are stopped for mechanical and electrical maintenance for 16 to 18 hours annually and for visual inspection for 6 to 7 hours quarterly. Further the performance report of project WEGs has been added in appendix 1. During the monitoring period there were no events or situations occurred, which may impact the applicability of the methodology.

The Project involves 63 wind energy generators (WEGs) of Enercon make (800 kW E-48) with internal electrical lines connecting the Project with local evacuation facility. The WEGs generates 3-phase power at 400V, which is stepped up to 33 kV. 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 other salient features of the state-of-art-technology are:

- Gearless Construction - Rotor & Generator Mounted on same shaft eliminating the Gearbox.
- Variable speed function – has the speed range of 18 to 33 RPM thereby ensuring optimum efficiency at all times.
- Variable Pitch functions ensuring maximum energy capture.
- Near Unity Power Factor at all times.
- Minimum drawal (less than 1% of kWh generated) of Reactive Power from the grid.
- No voltage peaks at any time.
- Operating range of the WEG 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 and uses Air Brakes.
- Three Independent Braking System.
- 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) 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. Diagram of main component of Enercon make E-48 is shown in below picture:-

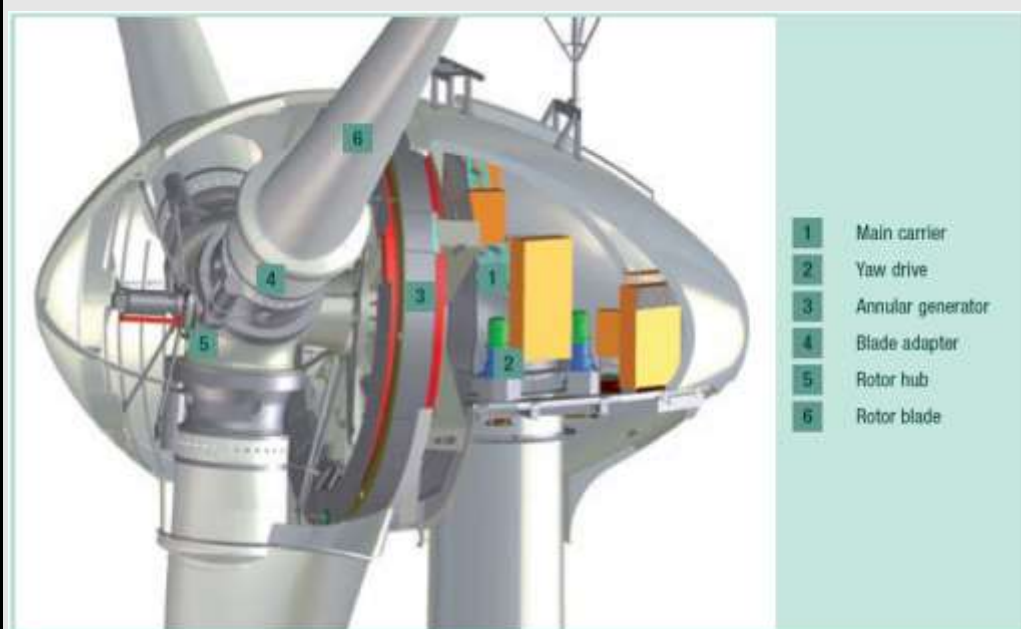


Figure: Enercon make E-48 Diagram.

B.2. Post registration changes

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

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Not applicable

B.2.2. Corrections

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Not applicable

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

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PP has applied for change in monitoring plan to UNFCCC. PP submitted revised PDD with revised MP, version 10.0 (dated 12.04.2013) to UNFCCC which has been approved on 22 Sep 2013 by UNFCCC (PRC ref: PRC-2819-001; web-link:<http://cdm.unfccc.int/PRCContainer/DB/prcp638052220/view>).

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

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Not applicable

B.2.5. Changes to start date of crediting period

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Not applicable

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

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Not applicable

SECTION C. Description of monitoring system

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Approved consolidated baseline and monitoring methodology ACM0002 Version 09 Sectoral Scope: 1, by CDM – Meth Panel is proposed to be used to monitor the emission reductions.

This approved monitoring methodology requires monitoring of the electricity generation from the project activity.

Emission factor for the project activity as mentioned in registered PDD was determined ex-ante, which is fixed throughout the crediting period of project activity. Further, wind based electricity generation is not associated with any kind of leakages. Hence, the sole parameter for monitoring is the electricity generated by the project and supplied to the grid.

Procedure for Computing Net Electricity Supplied to the Grid by the Project Activity:

Line diagrams of the project activity showing all relevant monitoring points has been presented below. There are total three metering points for the project activity.

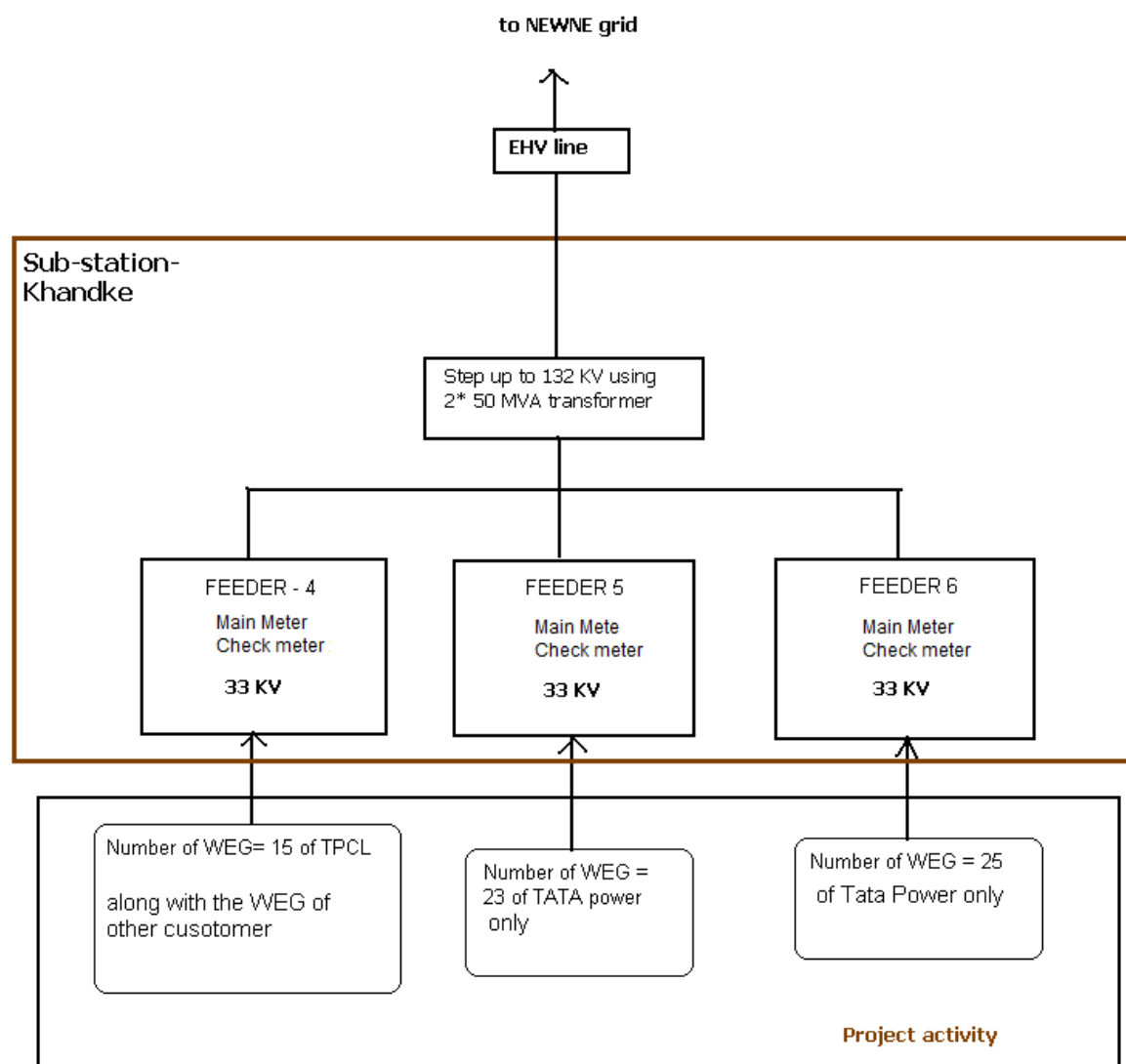


Figure: Line diagram of the project activity in current situation.

As shown in the above line diagram, the project activity is connected to feeder 4, 5 and 6. Each feeder has one set of main & check meter. The main and check meters that are connected to feeder 5 and 6 are dedicated meters for the project activity i.e. no WEGs of other customer(s) are connected to these meters. Feeder 5 is dedicated to 23 WEGs of the project activity while Feeder 6 dedicated to 25 WEGs of the project activity. However the main and check meters for feeder 4 is connected to 15 WEGs of the project activity and 09 WEGs of the non-project activity.

The sharing of any feeder among WEGs is being done by the state utility, based on the load carrying capacity of that particular feeder and also based on the load profile at connected substation. Each feeder has one set of main & check meter. In the actual project scenario, the main and check meters at feeder 5 and feeder 6 are connected to 23 and 25 WEGs respectively which are dedicated to the project activity. In other words, no other WEGs of different customer(s) are being connected to feeder 5 and feeder 6 considering the present load carrying capacity of these feeders. As there are no WTGs of other customers(s) are connected to the meters at feeder 5 and feeder 6, the apportioning procedure to arrive at electricity generated by WTGs with respect to their customer(s), has not been applied here. However the main and check meters for feeder 4 are connected to 15 WEGs of the project activity and 09 WEGs of the non-project activity, considering the load carrying capacity of this feeder. Therefore for feeder 4, the apportioning procedure is applied to compute the electricity that can be allocated to 15 WEGs of the project activity. The apportioning procedure is done by Enercon and certified by MSEDCL, where the customers do not have any control. These apportioning calculations are as per the standard procedures & guidelines of MSEDCL, who authorises JMR reports and issuing the same to the customers. Based on the apportioning, the apportioned values of electricity export

and import by WEGs connected to feeder 4 are noted in the credit certificate (credit notes) which is being issued to the individual customers with respect to their WEGs connected to the feeder 4.

Further, the above mentioned configuration of any feeder may change in future depending upon the load carrying capacity of the feeder and also the load profile at connected sub-station. The same apportioning procedure, as explained below, will be followed for all the feeders if required (in the case where the common metering is done for the WTGs of project activity and non-project activity, for any of the feeder).

Procedure of apportioning in case of common metering (both project activity & non project activity WEGs are connected to same feeder meter):-

The generated electricity is measured through a two-step procedure, wherein the first metering is carried out at the controller of each WEG at the project site. The monitoring of all these WEGs is done from a common monitoring station as a part of central monitoring system (CMS). $EG_{gross,y}$ is the electricity generated from an individual WEG measured through its controller panel meter and connected to common feeder meter. The summation of total Electricity generated from WEGs of the project proponent from individual meters (controller panel meter) in MWh is presented as:

$$\sum_{y=0}^n EG_{gross,y}$$

where n = No of WEGs of project proponent connected at common MSEDCL meter at feeder

and the summation of total Electricity generated (controller panel meter) from the other WEGs (total number of WEGs = m) attached to the common MSEDCL feeder meter connected to substation in MWh is presented as:

$$\sum_{y=0}^m EG_{gross,y}$$

where m = No of WEGs of other customers connected at common MSEDCL meter at feeder (this value is not under the control of project proponent and cannot be monitored by project proponent).

The second metering is carried out at grid interconnection point (i.e. substation) wherein the Joint Meter Reading (JMR) is carried out on first day of every month in presence of the representatives of the project proponent & the state electricity utility (MSEDCL). JMRs for all the feeders include electricity exported and imported by the project activity (along with WEGs of non-project activity, if any). The JMR report gives both the "export" ($EG_{JMR,export}$) and "import" ($EG_{JMR,import}$) of the electricity to/from the NEWNE grid based on common MSEDCL meter readings. This JMR is used for calculation of the amount of net electricity supplied to the grid. MSEDCL also provides the credit certificate to the project proponent that provides data on electricity export and import.

The apportioning of electricity generated from the various WEGs which are connected to one feeder meter, is done by Enercon based on the power generation from the individual WEGs connected to this MSEDCL feeder meter. Operation and maintenance personnel from Enercon prepare a monthly report on generation and consumption. This report (named as 'Energy Break-up Report') contains the details of power exported/imported to/from the grid by WEG(s) of connected. This apportioned value is then submitted to MSEDCL and on the basis of this Break-up Report and JMR, MSEDCL issues the credit certificates to the individual customers with respect to their WEG(s) connected to the feeder.

EG_{export} the electricity export to the grid by the project activity WEGs connected at common MSEDCL feeder meter is calculated as follows:

$$EG_{export} = \frac{EG_{JMR, export} \times \sum_{y=0}^n EG_{gross,y}}{\sum_{y=0}^n EG_{gross,y} + \sum_{y=0}^m EG_{gross,y}} \quad \dots\dots\dots(1)$$

EG_{import} the electricity import from the grid by the project activity WEGs connected at common MSEDCL meter is calculated as follows:

$$EG_{import} = \frac{EG_{JMR, import} \times \sum_{y=0}^n EG_{gross,y}}{\sum_{y=0}^n EG_{gross,y} + \sum_{y=0}^m EG_{gross,y}} \dots\dots\dots(2)$$

Where,

$E_{JMR,Export}$ is electricity exported, as recorded by the main meter at common MSEDCL feeder meter at substation.

$E_{JMR,Import}$ is electricity imported, as recorded by the main meter at common MSEDCL feeder meter at substation.

The above method of apportioning is as per the standard procedures & guidelines of MSEDCL and authorised by the MSEDCL.

Further formula (1) & (2) is used to calculate the electricity export & import of project activity connected at common feeder at MSEDCL sub-station.

While in case of dedicated feeder meters $EG_{export} = EG_{JMR,export}$ & $EG_{import} = EG_{JMR,import}$.

EG_y , the net electricity supplied to the grid by the project activity WEGs connected to all the feeders (common as well as dedicated feeder meter) at MSEDCL substation, is calculated as follows:

$$EG_y = \sum EG_{export} - \sum EG_{import} \dots\dots\dots(3)$$

Where,

$\sum EG_{export}$ is summation of electricity export values of project activity as recorded at all the feeders at MSEDCL sub-station (sourced from monthly JMR reports along with the break-up reports).

$\sum EG_{import}$ is summation of electricity import values of project activity as recorded at all the feeders at MSEDCL sub-station (sourced from monthly JMR reports along with the break-up reports).

The apportioning procedure is described in details only to provide the clear description of entire procedure by relevant authority. Further the apportioning procedure requires the generation data of other project proponents as mentioned in above formula. Since project participant is not authorised to access the generation data of other project proponents, the value of electricity export & import is sourced directly from JMR/credit note as provided by the state utility and the apportioning procedure is done by Enercon officials only where the project proponent has no control.

Following parameters are to be monitored by the project proponent:-

S. No.	Parameter	Description	Source of Data
1	$\sum EG_{JMR, export}$	Summation of Electricity exported to the grid, as recorded by the main meter at each feeder at MSEDCL substation.	Joint Meter Reading
2	$\sum EG_{JMR, import}$	Summation of electricity imported from the grid, as recorded by the main meter at each feeder at MSEDCL substation.	Joint Meter Reading
3	$\sum EG_{gross,y}$	The summation of total electricity generated from WEGs of the project proponent from individual meters (i.e. WEG controller panel meter) attached to the each feeder connected to MSEDCL substation	WEG controller panel meter (Online SCADA system)
4	$\sum EG_{export}$	Summation of Electricity exported by the project activity to the grid as recorded at JMR at each feeder at MSEDCL substation.	Joint Meter Reading along with the Energy

			Break-up Report
5	$\sum EG_{import}$	Summation of electricity imported by the project activity from the grid as recorded at JMR at each feeder at MSEDCL substation	Joint Meter Reading along with the Energy Break-up Report
6	EG_y	Net electricity supplied to the grid by the project activity.	Joint Meter Reading along with the Energy Break-up Report

Following parameter is not under the control of project proponent and recorded by Enercon only:-

S. No.	Parameter	Description
1.	$m \sum_{y=0} EG_{gross,y}$	The summation of total Electricity generated (recorded at controller panel meter) from the non-project activity WEGs (total number of WEGs = m) attached to the each feeder connected to MSEDCL substation

The net electricity supplied to the grid which is the summation of net electricity supplied by project activity as recorded at all the feeder meters and sourced from JMRs along with Energy Break-up Report, which can be cross checked from the credit notes provided by the MSEDCL.

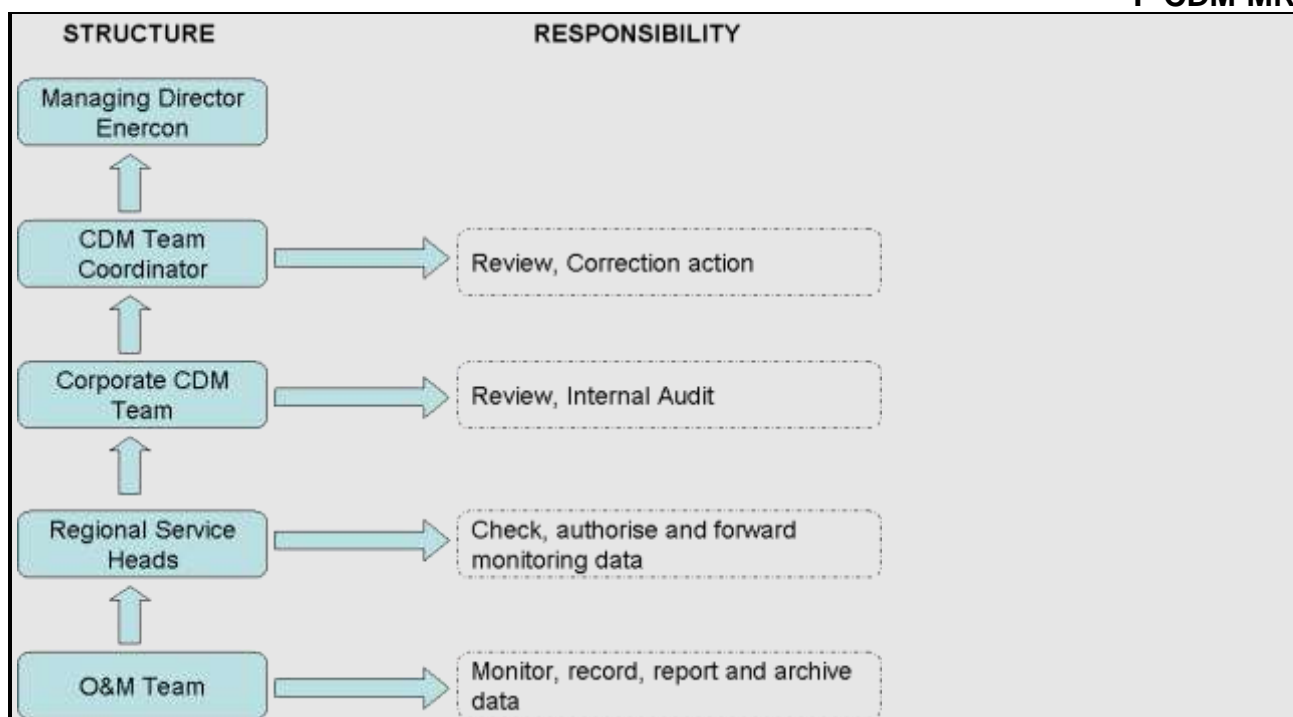
The Project is operated and managed by Enercon (India) Ltd. Enercon India Limited is an ISO 9001:2008 certified Quality Management system. Enercon India Limited follows the documentation practices to ensure the reliability and availability of the data for all the activities as required from the identification 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. The project adheres to all the mandatory regulatory and statutory requirements at the state as well as national level.

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.

The operational and management structure implemented by Enercon is as follows:



Procedure for data uncertainty:-

The metering equipment is tested by State Utility on annual basis. The main and check meters are tested annually by state utility. Procedure to deal with metering equipment failure:-

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. 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 meter and the corresponding check meter are found to be beyond the permissible limits of error, both the main meter & check meter 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.
- 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
- The controller meters do not require calibration as the energy readings of electricity generated at the controller meter is cross verified by the energy calculated by inverting system installed in the WEGs. In case there is any mismatch in the energy values recorded by the controller meter and the energy values calculated by the inverting system; the machine will stop working and generate the error report. The operations and maintenance staff will attend to the problem immediately in order to identify the error and correction factor will be determined
- 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.

Meter Test Checking Details:

The WEGs of the project activity are connected to three meters and therefore in total there are six meters including main and check meters. Meter details for the all the feeder meters is given below:

Meter details for new meters:-

Feeder No	Main/Check meter	Meter Serial No.	Make	Accuracy	Meter Testing Details	
					2012	Validity
Feeder -4	Main meter	14796479	Elster	0.2s	30/07/2013	29/07/2014
	Check meter	14796480	Elster	0.2s	30/07/2013	29/07/2014
Feeder -5	Main meter	14796481	Elster	0.2s	30/07/2013	29/07/2014
	Check meter	14796482	Elster	0.2s	30/07/2013	29/07/2014
Feeder -6	Main meter	14796483	Elster	0.2s	30/07/2013	29/07/2014
	Check meter	14796484	Elster	0.2s	30/07/2013	29/07/2014

SECTION D. Data and parameters

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

Data / Parameter:	$EF_{CM,y}$
Unit:	tCO ₂ e/MWh
Description:	Combined Margin Emission Factor of NEWNE Electricity Grid.
Source of data:	“CO2 Baseline Database for Indian Power Sector” published by the Central Electricity Authority, Ministry of Power, Government of India. The “CO2 Baseline Database for Indian Power Sector”, version 1.1 is available at http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm
Value(s) applied:	= 0. 94022
Purpose of data:	Calculation of Baseline Emissions
Additional comment:	Value is fixed ex-ante for entire crediting period.

Data / Parameter:	$EF_{OM,y}$
Unit:	tCO ₂ e/MWh
Description:	Operating Margin Emission Factor of Western Electricity Grid

Source of data:	<p>“CO2 Baseline Database for Indian Power Sector” published by the Central Electricity Authority, Ministry of Power, Government of India.</p> <p>The “CO2 Baseline Database for Indian Power Sector” version 1.1 is available at http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm</p>		
Value(s) applied:	2002-03	0.9814	
	2003-04	0.9903	
	2004-05	1.0119	
	Average	0.99455	
Purpose of data:	Calculation of Baseline Emissions		
Additional comment:	Value is fixed ex-ante for entire crediting period.		

Data / Parameter:	$EF_{BM,y}$		
Unit:	tCO ₂ e/MWh		
Description:	Build Margin Emission Factor of Western Electricity Grid		
Source of data:	<p>“CO2 Baseline Database for Indian Power Sector” published by the Central Electricity Authority, Ministry of Power, Government of India.</p> <p>The “CO2 Baseline Database for Indian Power Sector” version 1.1 is available at http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm</p>		
Value(s) applied:	2004 – 05	0.77722	
Purpose of data:	Calculation of Baseline Emissions		
Additional comment:	Value is fixed ex-ante for entire crediting period.		

Please refer Annex 1 for combined margin calculation

D.2. Data and parameters monitored

Data / Parameter:	EG_y
Unit:	MWh (Mega-watt hour)
Description:	Net electricity supplied to the grid by the Project activity in year y.
Measured/ Calculated / Default:	Measured & Calculated
Source of data:	<p>Summation of ‘net export of electricity to the grid’ as recorded in monthly ‘JMR reports’ along with the ‘energy break-up reports’³ for all the feeder meters at MSEDCL sub-station.</p> <p>Where,</p> $EG_y = \sum EG_{\text{export}} - \sum EG_{\text{import}}$ <p>Net electricity supplied to the grid by the project activity is calculated as per formula (3) given in section C.</p>

³ For the feeders where there is sharing of meter by different developers, JMR reports are supported by breakup sheets prepared by the O&M contractor which is based on the monthly JMR reading and the controller meter reading, while

Value(s) of monitored parameter:	Net electricity supplied to the grid by the Project = 119,675.568 MWh
Monitoring equipment :	Since it is calculated value, hence not applicable.
Measuring/ Reading/ Recording frequency:	Frequency of recording data: Monthly
Calculation method (if applicable):	The net electricity supplied to grid is a calculated value and would be determined as the difference between the summation of electricity exported to the grid and the summation of electricity imported from the grid by the project activity and the same value would be reported in JMR report along with the break-up report, on monthly basis. Detailed procedure for calculating the net electricity supplied to the grid is given in section C.
QA/QC procedures:	The value of net electricity supplied to the grid can be cross checked from the credit certificates (credit notes) provided by MSEDCL. QA/QC procedures are implemented by MSEDCL pursuant to the provisions of the power purchase agreement. Refer Annex-2 for an illustration of the provisions for QA/QC procedures.
Purpose of data:	Calculation of Baseline Emissions
Additional comment:	The data is archived both in electronic and hard paper format for crediting period + 2 years.

Data / Parameter:	$\sum EG_{JMR, export}$
Unit	MWh (Mega-watt hour)
Description:	Summation of Electricity exported to the grid, as recorded by the main meter at each feeder meters at MSEDCL substation
Measured/ Calculated / Default:	Measured
Source of data:	The value of electricity exported to the grid is taken from the monthly JMR reports.
Value(s) of monitored parameter:	=138,823.659 MWh
Monitoring equipment:	Please refer section 'C' (Description of monitoring system) for the details of meter type, accuracy class, serial number, meter test checking frequency, date of last meter test checking and validity under the heading 'Meter Test Checking Details'

for dedicated metering points JMR contains the value of export , import & net export of project activity WEGs. Each JMR contains the value of export, import & net electricity export to the grid

Measuring/ Reading/ Recording frequency:	Frequency of recording data: Monthly. Main and Check meters measure the electricity (export & the import) on continuous basis and recorded by state utility on monthly basis. The value of electricity export is jointly noted from the main meter installed at each feeder meter at pooling substation which is managed by Enercon under the jurisdiction of MSEDCL.
Calculation method (if applicable):	Please refer section 'C' for calculation procedure
QA/QC procedures:	The meters are calibrated once in a year by the state utility. Refer Annex – 2 for an illustration of the provisions for QA/QC procedures.
Purpose of data:	Calculation of Baseline Emissions
Additional comment:	The data is archived both in electronic and hard paper format for crediting period + 2 years

Data / Parameter:	$\sum EG_{JMR, import}$
Unit:	MWh (Mega-watt hour)
Description:	Summation of electricity imported from the grid, as recorded by the main meter at each feeder meter at MSEDCL substation.
Measured/ Calculated / Default:	Measured
Source of data:	The value of electricity imported from the grid is taken from the monthly JMR reports
Value(s) of monitored parameter:	= 39.111 MWh
Monitoring equipment:	Please refer section 'C' (Description of monitoring system) for the details of meter type, accuracy class, serial number, meter test checking frequency, date of last meter test checking and validity under the heading 'Meter Test Checking Details'
Measuring/ Reading/ Recording frequency:	Frequency of recording data: Monthly. Main and Check meters measure the electricity (export & the import) on continuous basis and recorded by state utility on monthly basis. The value of electricity import is jointly noted from the main meter installed at each feeder meter at pooling substation which is managed by Enercon under the jurisdiction of MSEDCL.
Calculation method (if applicable):	Please refer section 'C' for calculation procedure
QA/QC procedures:	The meters are calibrated once in a year by the state utility. Refer Annex – 2 for an illustration of the provisions for QA/QC procedures.
Purpose of data:	Calculation of Baseline Emissions
Additional comment:	The data is archived both in electronic and hard paper format for crediting period + 2 years

Data / Parameter:	$\Sigma EG_{\text{gross},y}$
Unit:	MWh (Mega-watt hour)
Description:	Summation of total electricity generated from WEGs of the project proponent from individual meters (i.e. WEG controller panel meter) attached to the each feeder meter connected to MSEDCL substation
Measured/ Calculated / Default:	Measured
Source of data:	Generation value from the WEG panel meter (Online SCADA system).
Value(s) of monitored parameter:	= 119,663.882 MWh
Monitoring equipment:	Controller meter (LCS) is electronic meter is installed in individual WEGs, which does not required calibration.
Measuring/ Reading/ Recording frequency:	Frequency of recording data: Monthly. Panel meter (LCS controller) measures the net electricity generation (Gross Export) on continuous basis and daily/monthly data can be sourced/ recorded from online SCADA system.
Calculation method (if applicable):	Please refer section 'C' for calculation procedure.
QA/QC procedures:	The controller panel meters do not require calibration as the energy readings of electricity generated at the controller meter is cross verified by the energy calculated by inverting system installed in the WEGs. Refer Annex – 2 for an illustration of the provisions for QA/QC procedures.
Purpose of data:	Calculation of Baseline Emissions.
Additional comment:	The data is archived in electronic form for crediting period + 2 years.

Data / Parameter:	$\Sigma EG_{\text{export}}$
Unit:	MWh (Mega-watt hour)
Description:	Summation of electricity exported by the project activity to the grid as recorded at JMR at each feeder at MSEDCL substation
Measured/ Calculated / Default:	For Feeder 5 & 6 value of parameter is measured directly, while for feeder 4 value of parameter is calculated as per procedure mentioned under section C of MR.
Source of data:	The value of electricity exported by the project activity to the grid for each feeder meter is taken from monthly JMR reports along with the break-up reports.
Value(s) of monitored parameter:	= 119,710,902 MWh
Monitoring equipment:	Please refer section 'C' (Description of monitoring system) for the details of meter type, accuracy class, serial number, meter test checking frequency, date of last meter test checking and validity under the heading 'Meter Test Checking Details'

Measuring/ Reading/ Recording frequency:	Frequency of recording data: Monthly
Calculation method (if applicable):	<p>$\sum EG_{\text{export}}$ is summation of electricity export values of all the feeder meters at MSEDCL sub-station.</p> <p>For the common feeder meter EG_{export} is calculated as per equation no. (1) given under section C, while in case of dedicated feeder meters</p> $EG_{\text{export}} = EG_{\text{JMR,export}}$
QA/QC procedures:	Electricity exported by the project activity to the grid can be cross checked from the credit certificates provided by MSEDCL. Refer Annex – 2 for an illustration of the provisions for QA/QC procedures
Purpose of data:	Calculation of Baseline Emissions
Additional comment:	The data is archived both in electronic and hard paper format for crediting period + 2 years
Data / Parameter:	$\sum EG_{\text{import}}$
Unit:	MWh (Mega-watt hour)
Description:	Summation of electricity imported by the project activity from the grid as recorded at JMR at each feeder at MSEDCL substation
Measured/ Calculated / Default:	For Feeder 5 & 6 value of parameter is measured directly, while for feeder 4 value of parameter is calculated as per procedure mentioned under section C of MR.
Source of data:	The value of electricity imported by the project activity from the grid for each feeder meter is taken from monthly JMR reports along with the break-up reports.
Value(s) of monitored parameter:	=35.334 MWh
Monitoring equipment:	Please refer section 'C' (Description of monitoring system) for the details of meter type, accuracy class, serial number, meter test checking frequency, date of last meter test checking and validity under the heading 'Meter Test Checking Details'
Measuring/ Reading/ Recording frequency:	Frequency of recording data: Monthly
Calculation method (if applicable):	<p>$\sum EG_{\text{import}}$ is summation of electricity import values of all the feeder meters at MSEDCL sub-station.</p> <p>For the common feeder meter EG_{import} is calculated as per equation no. (2) given under section C, while in case of dedicated feeder meters</p> $EG_{\text{import}} = EG_{\text{JMR,import}}$
QA/QC procedures:	Electricity imported by the project activity from the grid can be cross checked from the credit certificates provided by MSEDCL. Refer Annex – 2 for an illustration of the provisions for QA/QC procedures.

Purpose of data:	Calculation of Baseline Emissions
Additional comment:	The data is archived both in electronic and hard paper format for crediting period + 2 years

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.

$$BE_y = EG_y * EF_y$$

Where,

BE is baseline emissions in year y, tCO₂e

EG_y is the net electricity supplied to the grid in year y and is applied directly from JMR (Form B) certified by state utility. This value can also be cross checked from the credit notes provided by MSEDCL.

EF_y is the CO₂ emission factor of the grid (0.94022 tCO₂e/MWh fixed ex-ante).

Baseline Emission Reductions calculation for project activity:-

Duration	Electricity export to the grid by the Project activity [MWh]	Electricity import from grid by the Project activity [MWh]	Net electricity generation supplied to the grid by the Project activity [MWh]	Baseline Emission Factor (tCO ₂ e/MWh)	Baseline Emissions (tCO ₂ e)
	[EG _{Export,y}]	[EG _{Import,y}]	[EG _y]	[EF _y]	[BE _y] = [EG _y] * [EF _y]
01 May 13 to 31 May 14	119,710.902	35.334	119,675.568	0.94022	112,521

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

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

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 ₂ e)	Project emissions or actual net GHG removals by sinks (t CO ₂ e)	Leakage (t CO ₂ e)	Emission reductions or net anthropogenic GHG removals by sinks (t CO ₂ e)
Total	112,521	0	0	112,521

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
Emission reductions or GHG removals by sinks (t CO₂e)	90,073 based on number of days (365 days) involved in current monitoring period. (as per registered PDD annual emission reductions estimated is 83,022)	112,521

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

>>

The CERs for the current monitoring period is 24.92% higher than the estimated value in the PDD. This is primarily due to seasonal nature of wind power projects therefore the expected CERs are more than the estimated in the PDD which provides estimates on annual basis.

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 CO₂e)	-	112,521 (for period 01/05/2013 to 31/05/2014)

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.2	5 November 2013	Editorial revision to correct table in page 1.
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		

Annex 1**BASELINE INFORMATION**

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. The emission factor for the project activity is fixed throughout the crediting period.

The Operating Margin data for the most recent three years and the Build Margin data for the NEWNE Electricity Grid as published in the CEA database version 1.1⁴ are as follows:

Simple Operating Margin

	NEWNE Grid (tCO₂e/MWh)
Simple Operating Margin – 2002-03	0.9814
Simple Operating Margin – 2003-04	0.9931
Simple Operating Margin – 2004-05	1.0119
Average Operating Margin of last three years	0.99455

Build Margin

	NEWNE Grid (tCO₂e/MWh)
Build Margin- 2004-05	0.77722

Combined Margin Calculations

	Weights	NEWNE Grid (tCO₂e/MWh)
Operating Margin	0.75	0.99455
Build Margin	0.25	0.77722
Combined Margin		0.94022

Detailed information on calculation of Operating Margin Emission Factor and Build Margin Emission Factor is available at http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm .

⁴ The “CO₂ Baseline Database for Indian Power Sector”, is available at http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm

Annex 2MONITORING INFORMATION

- **Metering:** Electricity supplied to the grid is metered by the Parties (MSEDCL, Project Participants).
- **Metering Equipment:** Metering system for the project activity consists of one main and one check meter at each feeder. Therefore in total there are three main and three check meters. All the feeder meters are two-way tri-vector meters capable of recording import and export of electricity. Metering equipment is maintained in accordance with electricity standards prevalent in Maharashtra.

In addition to feeder meters there is individual controller panel meter (LCS meter) installed inside each WEG of the project activity. The LCS meter readings are archived electronically on continuous basis.

- **Meter Readings:** The net electricity supplied to the grid is recorded by taking a Joint Meter Reading (JMR) in the presence of officials from MSEDCL and Enercon as O&M contractor, on behalf of project sponsor. 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 MSEDCL and by Enercon Officials. QA/QC of the Joint Meter Readings would be established through the calibration report of the Joint Meter.
- **Inspection of Energy Meters:** All main and check energy meters (export and import) and all associated instruments, transformers installed at the Project are of 0.2% 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:** There is a separate main and check meter for each 33 kV feeder. The Main and Check Meters are close to each other and is tested for accuracy, with a portable standard meter, by the MSEDCL/MSETCL Testing Division. The MSEDCL/MSETCL carried out the calibration, periodical testing, sealing and maintenance of meters. All the meters are tested at the Metering Point. The MSEDCL/MSETCL provided a copy of the test reports. If during any of the monthly meter readings, the variation between the main meter and the check meter is more than 0.2%, all the meters were re-tested and calibrated immediately by MSEDCL/MSETCL.

The controller panel meters do not require calibration as the energy readings of electricity generated at the controller meter is cross verified by the energy calculated by inverting system installed in the WEGs. In case there is any mismatch in the energy values recorded by the controller meter and the energy values calculated by the inverting system; the machine will stop working and generate the error report. The operations and maintenance staff will attend to the problem immediately in order to identify the error and correction factor will be determined.

Appendix 1: WEG Performance Report⁵

State	MAHARASHTRA			Monthly Performance Report				Date:01/05/2013-31/05/2014		
WEG No.	Generation		Lack Of Wind	Down Time				Machine Availability (%)	Capacity Factor (%)	Grid Availability (%)
	KWh	Hrs		Machine		Grid				
				Fault	Shutdown	Fault	Shutdow n			
Site: AGADGAON,MAHARASHTRA			THE TATA POWER COMPANY LIMITED					Total WEC : 25		
TPCL-01	1,880,077	8725:00:00	441:52:00	31:56:00	36:06:00	67:17:00	30:09:00	99.28	24.73	98.97
TPCL-02	1,813,997	8540:00:00	450:57:00	126:52:00	39:39:00	67:17:00	30:09:00	98.25	23.85	98.97
TPCL-03	2,006,970	8701:00:00	468:16:00	28:26:00	34:06:00	67:17:00	30:09:00	99.34	26.39	98.97
TPCL-04	2,020,631	8429:00:00	442:38:00	216:54:00	38:39:00	67:14:00	30:09:00	97.31	26.55	98.98
TPCL-05	2,067,590	8644:00:00	442:45:00	54:40:00	48:46:00	67:17:00	30:09:00	98.91	27.18	98.97
TPCL-06	2,073,327	8607:00:00	444:14:00	95:47:00	38:28:00	65:47:00	30:09:00	98.59	27.27	98.99
TPCL-07	2,109,236	8747:00:00	422:38:00	29:57:00	33:59:00	65:47:00	30:09:00	99.33	27.74	98.99
TPCL-08	1,894,328	8377:00:00	474:15:00	23:53	27:03:00	67:17:00	20:28	99.46	24.91	99.08
TPCL-09	1,908,669	8457:00:00	434:26:00	34:08:00	49:35:00	65:47:00	20:28	99.12	25.1	99.09
TPCL-10	1,809,825	8656:00:00	443:07:00	69:23:00	34:40:00	67:17:00	20:28	98.91	23.79	99.08
TPCL-11	1,838,523	8327:00:00	467:39:00	335:30:00	38:15:00	67:17:00	20:28	96.07	24.16	99.08
TPCL-12	1,901,247	8482:00:00	470:29:00	261:35:00	36:23:00	67:17:00	20:28	96.86	25	99.08
TPCL-13	1,880,457	8392:00:00	480:59:00	64:14:00	32:40:00	67:17:00	20:28	98.98	24.73	99.08
TPCL-14	1,840,461	8108:00:00	481:24:00	26:27:00	24:58:00	67:17:00	20:28	99.46	24.21	99.08
TPCL-15	1,905,142	8480:00:00	441:46:00	17:28	29:27:00	67:17:00	20:28	99.51	25.06	99.08
TPCL-16	1,918,774	8012:00:00	438:12:00	169:00:00	41:25:00	67:11:00	20:28	97.79	25.24	99.08
TPCL-17	2,021,686	8381:00:00	472:47:00	114:41:00	20:33	67:17:00	20:28	98.58	26.21	99.08
TPCL-18	2,171,367	8629:00:00	449:45:00	115:37:00	54:17:00	67:17:00	30:09:00	98.21	28.63	98.97
TPCL-19	1,879,587	8619:00:00	505:22:00	79:13:00	27:59:00	67:17:00	30:09:00	98.87	24.78	98.97
TPCL-38	2,097,210	8140:00:00	480:23:00	528:17:00	67:03:00	67:17:00	32:39:00	93.72	26.97	98.95
TPCL-39	2,150,930	8446:00:00	535:12:00	158:37:00	44:50:00	66:35:00	33:21:00	97.85	27.85	98.95

⁵ WEG Performance report is provided by O & M contract ("Enercon").

TPCL-40	2,001,858	8543:00:00	516:36:00	129:07:00	44:28:00	67:17:00	32:39:00	98.17	25.7	98.95
TPCL-41	1,939,900	8617:00:00	487:18:00	79:16:00	45:57:00	67:17:00	32:39:00	98.68	24.92	98.95
TPCL-42	1,918,428	8521:00:00	489:40:00	170:51:00	41:36:00	67:17:00	32:39:00	97.76	24.69	98.95
TPCL-43	2,067,126	8476:00:00	455:05:00	189:32:00	82:45:00	67:17:00	32:39:00	97.13	26.38	98.95
Total	49,117,346	212056:00	11637:45	3151:21:00	1013:37:00	1676:44:00	672:37:00	98.25	25.68	99.01
Site: MEHEKARI,MAHARASHTRA			THE TATA POWER COMPANY LIMITED						Total WEC : 15	
TPCL-48	1,485,458	8044:00:00	554:22:00	22:06	38:10:00	52:12:00	29:07:00	99.36	19.61	99.13
TPCL-49	1,946,456	8118:00:00	464:06:00	62:44:00	33:30:00	52:12:00	29:07:00	98.98	25.19	99.14
TPCL-50	1,640,825	7961:00:00	561:59:00	132:51:00	46:09:00	52:12:00	29:07:00	98.09	21.56	99.13
TPCL-51	2,113,035	7782:00:00	485:24:00	330:40:00	51:40:00	52:12:00	29:07:00	95.94	27.51	99.14
TPCL-52	2,308,498	8177:00:00	455:07:00	30:00:00	39:49:00	52:12:00	29:07:00	99.26	29.91	99.14
TPCL-53	1,716,661	8065:00:00	549:05:00	47:08:00	40:04:00	54:50:00	29:07:00	99.07	22.56	99.11
TPCL-54	1,825,693	7887:00:00	648:48:00	149:40:00	60:38:00	54:50:00	29:07:00	97.77	23.96	99.11
TPCL-55	2,240,224	7872:00:00	547:52:00	233:50:00	37:58:00	54:50:00	29:07:00	97.11	29.44	99.11
TPCL-56	2,041,403	7793:00:00	498:57:00	231:55:00	78:50:00	54:50:00	29:07:00	96.71	26.6	99.11
TPCL-57	2,054,561	7570:00:00	488:31:00	176:18:00	20:41	71:26:00	34:03:00	97.93	27.02	98.89
TPCL-58	2,056,274	8119:00:00	462:04:00	9:01	26:19:00	71:26:00	34:03:00	99.63	27.04	98.89
TPCL-59	2,224,989	7355:00:00	482:26:00	247:18:00	30:50:00	71:26:00	34:03:00	97.07	29.25	98.89
TPCL-60	1,812,841	7672:00:00	498:33:00	141:27:00	21:07	71:26:00	34:03:00	98.29	23.84	98.89
TPCL-61	1,754,093	7433:00:00	446:36:00	256:30:00	17:39	71:26:00	34:03:00	97.12	23.07	98.89
TPCL-62	1,903,262	7065:00:00	427:35:00	216:35:00	38:34:00	71:26:00	34:03:00	97.32	25.03	98.89
Total	29,124,273	116913:00	7571:25:00	2288:03:00	581:58:00	908:56:00	466:21:00	97.97	25.45	99.03
Site: RANJANI PH-1-DEOGAON,MAHARASHTRA			THE TATA POWER COMPANY LIMITED						Total WEC : 23	
TPCL-20	1,963,154	8004:00:00	442:58:00	71:15:00	63:56:00	40:02:00	30:49:00	98.58	25.82	99.25
TPCL-21	1,778,861	7739:00:00	458:17:00	76:01:00	39:59:00	40:02:00	31:52:00	98.78	23.46	99.24
TPCL-22	1,883,192	7958:00:00	459:27:00	105:20:00	49:22:00	40:02:00	31:52:00	98.37	24.83	99.24
TPCL-23	1,905,992	7768:00:00	437:08:00	15:41	34:39:00	40:02:00	31:52:00	99.47	25.13	99.24
TPCL-24	1,687,093	7244:00:00	373:59:00	136:18:00	33:09:00	40:02:00	31:52:00	98.21	22.25	99.24
TPCL-44	1,650,147	8494:00:00	594:18:00	2:08	40:27:00	40:02:00	23:16	99.55	21.56	99.33
TPCL-45	1,705,131	8369:00:00	638:52:00	122:27:00	35:10:00	40:02:00	23:16	98.34	22.32	99.33

F-CDM-MR

TPCL-46	1,672,278	8459:00:00	648:42:00	9:22	35:37:00	40:02:00	23:16	99.53	21.85	99.33
TPCL-47	1,500,213	7903:00:00	764:51:00	23:25	29:51:00	40:02:00	23:16	99.44	19.67	99.33
TPCL-25	1,876,749	8503:00:00	447:00:00	22:01	54:31:00	54:07:00	28:29:00	99.19	24.68	99.13
TPCL-26	1,801,091	8503:00:00	424:13:00	44:41:00	54:15:00	54:07:00	28:29:00	98.96	23.69	99.13
TPCL-27	1,829,362	8295:00:00	506:15:00	49:07:00	33:39:00	54:07:00	28:29:00	99.13	24.05	99.13
TPCL-28	1,689,424	8042:00:00	490:26:00	99:51:00	41:24:00	54:07:00	28:29:00	98.51	22.21	99.13
TPCL-29	1,845,173	8403:00:00	471:19:00	88:02:00	37:29:00	54:07:00	28:29:00	98.68	24.26	99.13
TPCL-30	1,808,330	8334:00:00	463:14:00	12:50	96:42:00	54:07:00	28:29:00	98.85	23.78	99.13
TPCL-31	1,721,223	7266:00:00	450:12:00	49:31:00	70:55:00	54:07:00	28:29:00	98.73	22.62	99.13
TPCL-32	1,819,138	8060:00:00	476:38:00	26:08:00	26:57:00	54:07:00	28:29:00	99.44	23.92	99.13
TPCL-33	1,817,990	8396:00:00	483:37:00	48:13:00	38:51:00	54:07:00	28:29:00	99.08	23.91	99.13
TPCL-34	1,738,247	8240:00:00	516:17:00	140:58:00	50:15:00	54:07:00	28:29:00	97.99	22.86	99.13
TPCL-35	1,891,922	8231:00:00	503:03:00	77:24:00	42:21:00	54:07:00	28:29:00	98.74	24.88	99.13
TPCL-36	2,233,706	8250:00:00	586:19:00	48:04:00	39:25:00	54:07:00	28:29:00	99.08	29.37	99.13
TPCL-37	1,819,283	8430:00:00	441:32:00	80:35:00	54:47:00	54:07:00	28:29:00	98.58	23.93	99.13
TPCL-63	1,784,564	8004:00:00	437:01:00	104:40:00	74:44:00	54:35:00	28:29:00	98.11	23.47	99.13
Total	41,422,263	186895:00	11515:38	1454:02:00	1078:25:00	1118:24:00	650:07:00	98.84	23.67	99.19