

**Monitoring report form
(Version 03.1)**

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 | 25/05/2013 |
| Registration date of the project activity | 01/06/2010 |
| Monitoring period number and duration of this monitoring period | 03 (01/02/2012 – 30/04/2013; including first and last days of monitoring period.) |
| Project participant(s) | 1) The Tata Power Company Limited 2) Enercon (India) Limited 3) Asian Development Bank, as Trustee of the Asia Pacific Carbon Fund (Spain) 4) Kingdom of Spain 5) Swedish Energy Agency |
| Host Party(ies) | India |
| Sectoral scope(s) and applied methodology(ies) | Sectoral Scope: 1, ACM0002, version 09 |
| Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD | 103,493 |
| Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period | 119,155 |

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 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 Feb 12 to 30 Apr 13) is 119,155 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 | Agadgaon | N19° 06' 24.9" | E74° 53' 27.0" |
| 38 | TPCL-38 | | 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 | Rajani Deogaon | N19° 07' 08.1" | E74° 52' 59.1" |
| 43 | TPCL-43 | | N19° 07' 16.0" | E74° 52' 59.1" |
| 44 | TPCL-44 | | N19° 09' 37.8" | E74° 53' 13.4" |
| 45 | TPCL-45 | | N19° 09' 30.0" | E74° 53' 13.9" |
| 46 | TPCL-46 | Mehekari | N19° 10' 11.5" | E74° 53' 19.6" |
| 47 | TPCL-47 | | N19° 10' 18.1" | E74° 53' 06.8" |
| 48 | TPCL-48 | | 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 | Rajani Deogaon | 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 | | 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) | The Tata Power Company Limited (Private entity) | No |
| India (host) | Enercon (India) Limited (Private entity) | No |
| Sweden | Asian Development Bank, as Trustee of the Asia Pacific Carbon Fund (Spain) Country - Sweden | No |
| Spain | Kingdom of Spain | No |
| Sweden | Swedish Energy Agency | No |

A.4. Reference of applied methodology

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

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

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

Tool for the demonstration and assessment of additionality – Version 5.2

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 |
| 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:-

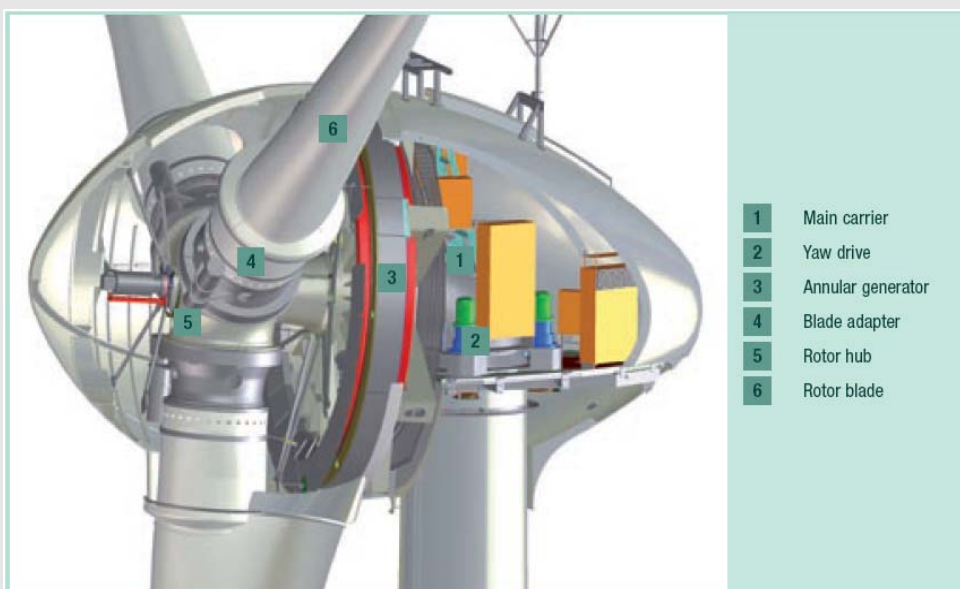


Figure: Enercon make E-48 Diagram.

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 has applied for "Request for approval of changes to the CDM project activity" dated 01 May 2013.

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 monitoring methodology ACM0002 Version 09 Sectoral Scope: 1, "Consolidated monitoring methodology for zero-emissions grid-connected electricity generation from renewable sources", 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.

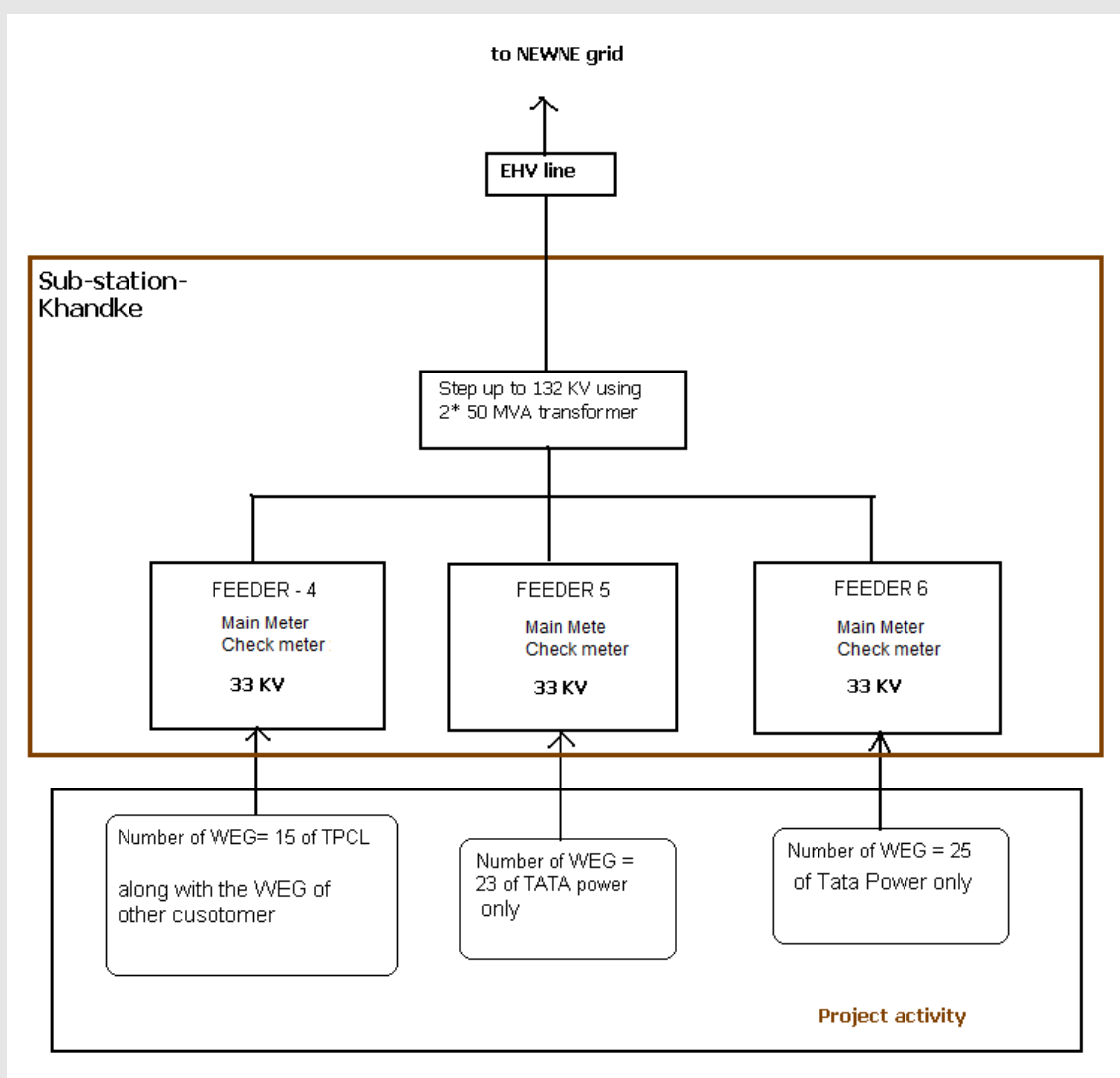


Figure: Line diagram of the project activity in current situation.

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:

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

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

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

Where,

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

$E_{\text{JMR, Import}}$ 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) will be 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 $EG_{\text{export}} = EG_{\text{JMR, export}}$ & $EG_{\text{import}} = EG_{\text{JMR, import}}$.

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:

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

Where,

$\sum EG_{\text{export}}$ 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).

$\sum EG_{\text{import}}$ 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 will be sourced directly from JMR/credit note as provided by the state utility and the apportioning procedure will be 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 | $\sum EG_{JMR, \text{ export}}$ | Summation of Electricity exported to the grid, as recorded by the main meter at each feeder at MSEDCL substation. | Joint Meter Reading |
| 2 | $\sum EG_{JMR, \text{ import}}$ | Summation of electricity imported from the grid, as recorded by the main meter at each feeder at MSEDCL substation. | Joint Meter Reading |
| 3 | $\sum EG_{\text{gross}, y}$ | 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 | $\sum EG_{\text{export}}$ | 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 | $\sum EG_{\text{import}}$ | 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. | $m \sum_{y=0} EG_{\text{gross}, y}$ | 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 will be sourced from JMRs along with Energy Break-up Report, which can be cross checked from the credit notes provided by the MSEDCL..

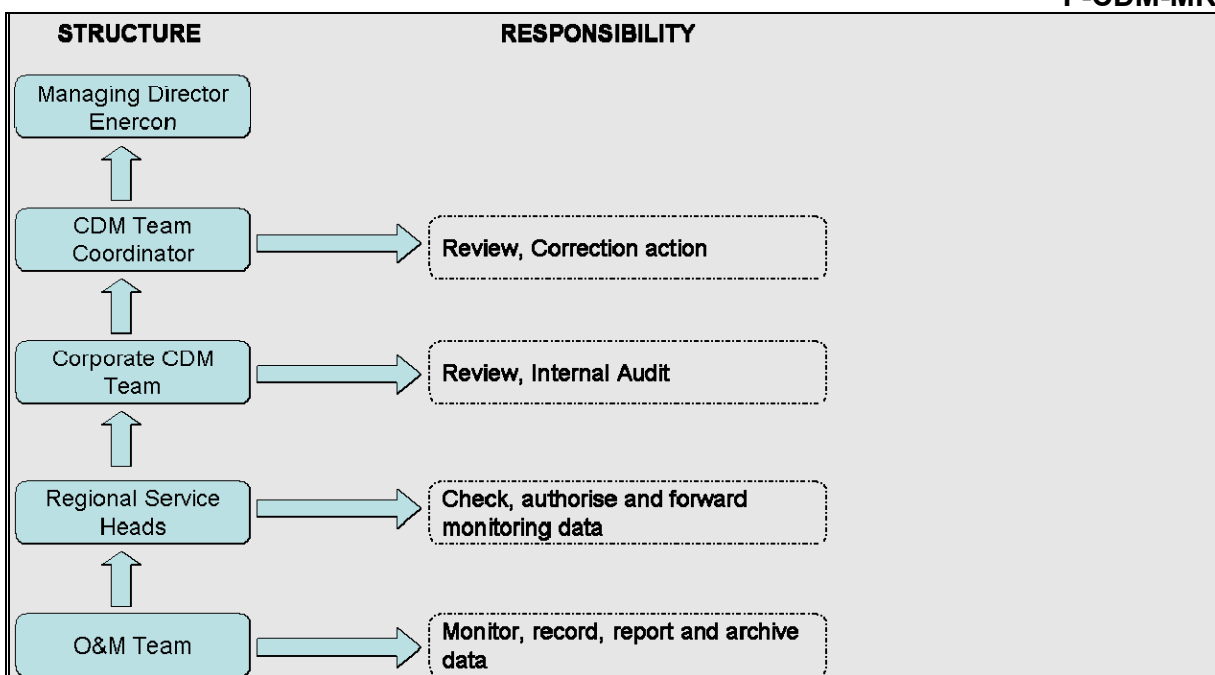
The Project is operated and managed by Enercon (India) Ltd. Enercon India Limited is an ISO 9001:2008 certified Quality Management system. Enercon India Limited follows the documentation practices to ensure the reliability and availability of the data for all the activities as required from the identification 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 will adhere 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 will be 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 are as follows:-

| Feeder No | Main/Check meter | Meter Serial No. | Make | Accuracy | Meter Testing Details | |
|-----------|------------------|------------------|--------|----------|-----------------------|------------|
| | | | | | 2012 | Validity |
| Feeder -4 | Main meter | 14796479 | Elster | 0.2s | 28/08/2012 | 27/08/2013 |
| | Check meter | 14796480 | Elster | 0.2s | 28/08/2012 | 27/08/2013 |
| Feeder -5 | Main meter | 14796481 | Elster | 0.2s | 28/08/2012 | 27/08/2013 |
| | Check meter | 14796482 | Elster | 0.2s | 28/08/2012 | 27/08/2013 |
| Feeder -6 | Main meter | 14796483 | Elster | 0.2s | 28/08/2012 | 27/08/2013 |
| | Check meter | 14796484 | Elster | 0.2s | 28/08/2012 | 27/08/2013 |

The main and check meters are tested annually by state utility. Calibration frequency is maintained annually.

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:

“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:

| | |
|---------|---------|
| 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:

tCO₂e/MWh

Description:

Build Margin Emission Factor of Western 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:

| | |
|-----------|---------|
| 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:

Calculated

Source of data:

Summation of ‘net export’ of electricity to the grid’ as recorded in monthly ‘JMR reports’ along with the ‘energy break-up reports’¹ for all the feeder meters at MSEDCL sub-station.

Where,

$EG_y = \sum EG_{\text{export}} - \sum EG_{\text{import}}$

Net electricity supplied to the grid by the project activity is calculated as per formula (3) given in section C.

¹ 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 = 126,731.966 MWh |
| Monitoring equipment : | Since it is calculated value, hence not applicable. |
| Measuring/ Reading/ Recording frequency: | Frequency of recording data: Monthly |
| Calculation method (if applicable): | <p>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.</p> <p>Detailed procedure for calculating the net electricity supplied to the grid is given in section C.</p> |
| QA/QC procedures: | <p>The value of net electricity supplied to the grid can be cross checked from the credit certificates (credit notes) provided by MSEDCL.</p> <p>QA/QC procedures will be as 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.</p> |
| Purpose of data: | Calculation of Baseline Emissions |
| Additional comment: | The data will be archived both in electronic and hard paper format for crediting period + 2 years. |

| | |
|----------------------------------|--|
| Data / Parameter: | $\sum EG_{JMR, \text{ export}}$ |
| 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: | Calculated |
| Source of data: | The value of electricity exported to the grid will be taken from the monthly JMR reports. |
| Value(s) of monitored parameter: | =145,115.299 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: | <p>-Frequency of recording data: Monthly.</p> <p>-Main and Check meters measure the electricity (export & the import) on continuous basis and recorded by state utility on monthly basis.</p> <p>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.</p> |
| Calculation method (if applicable): | Please refer section 'C' for calculation procedure |
| QA/QC procedures: | The meters will be 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 will be 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: | Calculated |
| Source of data: | The value of electricity imported from the grid will be taken from the monthly JMR reports |
| Value(s) of monitored parameter: | =46.300 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: | <p>-Frequency of recording data: Monthly.</p> <p>-Main and Check meters measure the electricity (export & the import) on continuous basis and recorded by state utility on monthly basis.</p> <p>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.</p> |
| Calculation method (if applicable): | Please refer section 'C' for calculation procedure |
| QA/QC procedures: | The meters will be 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 will be archived both in electronic and hard paper format for crediting period + 2 years |

| | |
|--|--|
| Data / Parameter: | $\sum EG_{gross,y}$ |
| 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: | Calculated |
| Source of data: | Generation value from the WEG panel meter (Online SCADA system). |
| Value(s) of monitored parameter: | =129,771.420 MWh |
| Monitoring equipment: | Please refer section 'C' and Annex 2 for details of controller meter (LCS). |
| 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 will be archived in electronic form for crediting period + 2 years. |

| | |
|---------------------------------------|--|
| Data / Parameter: | $\sum EG_{export}$ |
| 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: | Calculated |
| Source of data: | The value of electricity exported by the project activity to the grid for each feeder meter will be taken from monthly JMR reports along with the break-up reports. |
| Value(s) of monitored parameter: | =126,774.045 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} will be 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 will be 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 |
| Measure / Calculated / Default: | Calculated |
| Source of data: | The value of electricity imported by the project activity from the grid for each feeder meter will be taken from monthly JMR reports along with the break-up reports. |
| Value(s) of monitored parameter: | =42.079 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} will be 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 will be 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 _v] = [EG _v] * [EF _y] |
| 01 Feb 12 to 31 Dec 12 | 102617.134 | 33.532 | 102583.602 | 0.94022 | 96,451 |
| 1 Jan 13 to 30 Apr 13 | 24156.911 | 8.547 | 24148.364 | | 22,704 |
| Total | 126774.045 | 42.079 | 126731.966 | | 119,155 |

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

>>

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

E.3. Calculation of leakage

>>

No leakage is considered from the project activity as per approved methodology 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 | 119,155 | 0 | 0 | 119,155 |

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) | 103,493 based on number of days (455days) involved in current monitoring period. (as per registered PDD annual emission reductions estimated is 83,022) | 119,155 |

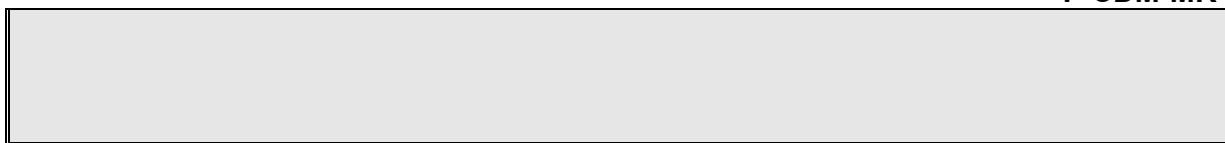
E.6. Remarks on difference from estimated value in registered PDD

>>

The CERs for the current monitoring period is 15.13% higher than the estimated volume in the PDD. This is primarily due to seasonal nature of wind power projects and monitoring period under consideration in this monitoring report covers the high wind season – 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) | 96,451 | 22,704 |



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Document information

| <i>Version</i> | <i>Date</i> | <i>Description</i> |
|---|-----------------|--|
| 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 will be fixed throughout the crediting period.

The Operating Margin data for the most recent three years and the Build Margin data for the Western Electricity Grid as published in the CEA database version 1.1² are as follows:

Simple Operating Margin

| | Western 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

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

Combined Margin Calculations

| | Weights | Western 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 .

² 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 will be tested for accuracy, with a portable standard meter, by the MSEDCL/MSETCL Testing Division. The MSEDCL/MSETCL will carry out the calibration, periodical testing, sealing and maintenance of meters. All the meters will be tested at the Metering Point. The MSEDCL/MSETCL will provide 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 will be 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 Report³

| State | MAHARASHTRA | | | Monthly Performance Report | | | | Date:01/02/2012-30/04/2013 | | |
|--|-------------|-------------------|--------------------------------|----------------------------|----------|----------|-----------|----------------------------|---------------------|-----------------------|
| WEG No. | Generation | | Lack Of Wind (hh:mm:ss) | Down Time (hh:mm:ss) | | | | Machine Availability (%) | Capacity Factor (%) | Grid Availability (%) |
| | KWh | Hrs (hh:mm:ss) | | Machine | | Grid | | | | |
| | | | | Fault | Shutdown | Fault | Shutdown | | | |
| Site: RANJANI PH-1-DEOGAON,MAHARASHTRA | | | THE TATA POWER COMPANY LIMITED | | | | | | Total WEC : 23 | |
| TPCL-20 | 1562390 | 7834:00:00 | 676:23:00 | 1966:32:00 | 57:38:00 | 35:45:00 | 138:33:00 | 81.46 | 17.78 | 98.4 |
| TPCL-21 | 2095597 | 9744:00:00 | 660:53:00 | 60:12:00 | 38:44:00 | 35:54:00 | 175:09:00 | 99.09 | 23.99 | 98.07 |
| TPCL-22 | 2100957 | 9752:00:00 | 660:02:00 | 41:55:00 | 48:24:00 | 35:54:00 | 175:09:00 | 99.17 | 24.05 | 98.07 |
| TPCL-23 | 2101595 | 9675:00:00 | 699:38:00 | 95:04:00 | 38:24:00 | 35:54:00 | 175:09:00 | 98.78 | 24.06 | 98.07 |
| TPCL-24 | 2009941 | 9769:00:00 | 650:00:00 | 47:13:00 | 33:02:00 | 35:54:00 | 178:29:00 | 99.27 | 23.01 | 98.04 |
| TPCL-44 | 1849434 | 9761:00:00 | 811:15:00 | 46:40:00 | 36:21:00 | 35:51:00 | 34:32:00 | 99.24 | 21.17 | 99.36 |
| TPCL-45 | 1916466 | 9723:00:00 | 838:17:00 | 52:45:00 | 37:32:00 | 35:51:00 | 34:32:00 | 99.17 | 21.94 | 99.36 |
| TPCL-46 | 1817280 | 9528:00:00 | 901:06:00 | 172:17:00 | 36:09:00 | 35:51:00 | 34:32:00 | 98.09 | 20.8 | 99.36 |
| TPCL-47 | 1751745 | 9276:00:00 | 1297:07:00 | 34:06:00 | 38:16:00 | 35:51:00 | 34:32:00 | 99.34 | 20.05 | 99.36 |
| TPCL-25 | 2015283 | 9937:00:00 | 726:54:00 | 21:25 | 76:25:00 | 35:14:00 | 14:00 | 99.1 | 23.07 | 99.55 |
| TPCL-26 | 1958616 | 9974:00:00 | 706:06:00 | 11:13 | 55:55:00 | 35:14:00 | 15:59 | 99.39 | 22.42 | 99.53 |
| TPCL-27 | 1921455 | 9800:00:00 | 827:21:00 | 77:40:00 | 53:44:00 | 35:14:00 | 15:59 | 98.8 | 21.99 | 99.53 |
| TPCL-28 | 1764299 | 9823:00:00 | 806:49:00 | 75:07:00 | 46:22:00 | 35:14:00 | 15:59 | 98.89 | 20.19 | 99.53 |
| TPCL-29 | 1931747 | 9908:00:00 | 763:32:00 | 33:42:00 | 54:38:00 | 35:14:00 | 14:25 | 99.19 | 22.11 | 99.55 |
| TPCL-30 | 1857065 | 9869:00:00 | 798:53:00 | 33:32:00 | 56:46:00 | 35:14:00 | 14:25 | 99.17 | 21.26 | 99.55 |
| TPCL-31 | 1886532 | 9750:00:00 | 876:21:00 | 60:16:00 | 59:27:00 | 35:14:00 | 15:59 | 98.9 | 21.59 | 99.53 |
| TPCL-32 | 1938634 | 9873:00:00 | 773:06:00 | 52:58:00 | 56:11:00 | 35:14:00 | 15:59 | 99 | 22.19 | 99.53 |
| TPCL-33 | 1913849 | 9917:00:00 | 752:29:00 | 37:31:00 | 50:27:00 | 35:14:00 | 15:59 | 99.19 | 21.91 | 99.53 |
| TPCL-34 | 1876649 | 9838:00:00 | 839:55:00 | 34:28:00 | 45:57:00 | 35:14:00 | 14:25 | 99.26 | 21.48 | 99.55 |
| TPCL-35 | 1892978 | 9802:00:00 | 849:55:00 | 49:00:00 | 54:33:00 | 35:14:00 | 15:59 | 99.05 | 21.67 | 99.53 |

³ WEG Performance report is provided by O & M contract ("Enercon").

| | | | | | | | | | | |
|-----------------------------------|-----------------|------------------|---------------------------------------|-------------------|-------------------|------------------|-------------------|--------------|-----------------------|-------------|
| TPCL-36 | 2193820 | 9694:00:00 | 982:16:00 | 25:26:00 | 54:44:00 | 35:14:00 | 14:25 | 99.27 | 25.1 | 99.55 |
| TPCL-37 | 2008781 | 10048:00 | 647:14:00 | 14:04 | 47:58:00 | 35:14:00 | 14:25 | 99.43 | 22.99 | 99.55 |
| TPCL-63 | 1989264 | 9902:00:00 | 727:23:00 | 56:33:00 | 64:32:00 | 35:14:00 | 15:59 | 98.89 | 22.77 | 99.53 |
| Total | 44354377 | 223197:00 | 18272:55 | 3099:39:00 | 1142:09:00 | 816:01:00 | 1194:34:00 | 98.31 | 22.07 | 99.2 |
| Site: MEHEKARI,MAHARASHTRA | | | THE TATA POWER COMPANY LIMITED | | | | | | Total WEC : 37 | |
| TPCL-48 | 1759196 | 9828:00:00 | 882:59:00 | 28:21:00 | 58:55:00 | 60:40:00 | 31:59:00 | 99.2 | 20.14 | 99.15 |
| TPCL-49 | 2263868 | 9945:00:00 | 721:14:00 | 63:45:00 | 58:40:00 | 60:40:00 | 31:59:00 | 98.88 | 25.91 | 99.15 |
| TPCL-50 | 2032324 | 9829:00:00 | 837:45:00 | 59:33:00 | 62:50:00 | 60:40:00 | 31:59:00 | 98.88 | 23.26 | 99.15 |
| TPCL-51 | 2424313 | 9852:00:00 | 727:46:00 | 147:35:00 | 61:15:00 | 61:32:00 | 31:59:00 | 98.09 | 27.75 | 99.14 |
| TPCL-52 | 2613110 | 10023:00 | 678:36:00 | 31:15:00 | 50:54:00 | 61:32:00 | 32:59:00 | 99.25 | 29.91 | 99.13 |
| TPCL-53 | 1954050 | 9796:00:00 | 859:13:00 | 24:27:00 | 54:17:00 | 61:32:00 | 22:03 | 99.28 | 22.37 | 99.23 |
| TPCL-54 | 2085890 | 9694:00:00 | 861:21:00 | 101:31:00 | 57:10:00 | 61:32:00 | 22:03 | 98.55 | 23.88 | 99.23 |
| TPCL-55 | 2598059 | 9836:00:00 | 788:59:00 | 114:03:00 | 59:32:00 | 61:32:00 | 22:03 | 98.41 | 29.74 | 99.23 |
| TPCL-56 | 2375731 | 9843:00:00 | 798:37:00 | 36:04:00 | 56:31:00 | 61:32:00 | 22:03 | 99.15 | 27.19 | 99.23 |
| TPCL-57 | 2202131 | 9788:00:00 | 846:37:00 | 33:18:00 | 52:35:00 | 61:32:00 | 77:15:00 | 99.21 | 25.21 | 98.73 |
| TPCL-58 | 2009513 | 9458:00:00 | 821:32:00 | 80:13:00 | 355:10:00 | 61:32:00 | 77:15:00 | 96.01 | 23 | 98.73 |
| TPCL-59 | 2375975 | 9693:00:00 | 897:36:00 | 78:22:00 | 49:41:00 | 61:32:00 | 77:15:00 | 98.83 | 27.18 | 98.73 |
| TPCL-60 | 1950296 | 9779:00:00 | 808:46:00 | 79:09:00 | 43:21:00 | 61:32:00 | 77:15:00 | 98.88 | 22.32 | 98.73 |
| TPCL-61 | 1944849 | 9860:00:00 | 791:06:00 | 20:21 | 42:56:00 | 61:32:00 | 77:15:00 | 99.42 | 22.26 | 98.73 |
| TPCL-62 | 2146872 | 9741:00:00 | 828:21:00 | 76:04:00 | 55:56:00 | 61:32:00 | 76:38:00 | 98.79 | 24.57 | 98.73 |
| Total | 32736177 | 146965:00 | 12150:28 | 974:01:00 | 1119:43:00 | 920:24:00 | 712:00:00 | 98.72 | 24.98 | 99 |
| Site: AGADGAON,MAHARASHTRA | | | THE TATA POWER COMPANY LIMITED | | | | | | Total WEC : 50 | |
| TPCL-01 | 1969681 | 10011:00 | 607:50:00 | 45:27:00 | 39:11:00 | 76:03:00 | 38:54:00 | 99.23 | 22.55 | 98.95 |
| TPCL-02 | 1899532 | 9938:00:00 | 637:52:00 | 71:53:00 | 56:18:00 | 76:03:00 | 38:54:00 | 98.83 | 21.74 | 98.95 |
| TPCL-03 | 2091773 | 9945:00:00 | 676:20:00 | 37:25:00 | 44:10:00 | 76:03:00 | 38:54:00 | 99.25 | 23.94 | 98.95 |
| TPCL-04 | 2213460 | 10013:00 | 639:43:00 | 10:51 | 39:14:00 | 76:03:00 | 38:54:00 | 99.54 | 25.34 | 98.95 |
| TPCL-05 | 2143912 | 9849:00:00 | 612:00:00 | 199:02:00 | 42:07:00 | 76:03:00 | 38:54:00 | 97.79 | 24.54 | 98.95 |
| TPCL-06 | 2180213 | 9937:00:00 | 650:42:00 | 71:27:00 | 44:10:00 | 76:03:00 | 38:54:00 | 98.94 | 24.96 | 98.95 |
| TPCL-07 | 2231100 | 10023:00 | 608:47:00 | 31:43:00 | 40:34:00 | 76:03:00 | 38:54:00 | 99.34 | 25.54 | 98.95 |

F-CDM-MR

| | | | | | | | | | | |
|--------------|-----------------|------------------|-----------------|-------------------|-------------------|-------------------|-------------------|--------------|--------------|--------------|
| TPCL-08 | 2063329 | 9956:00:00 | 669:02:00 | 38:00:00 | 43:52:00 | 76:03:00 | 35:33:00 | 99.25 | 23.62 | 98.98 |
| TPCL-09 | 2073063 | 10038:00 | 637:07:00 | 17:02 | 35:40:00 | 76:03:00 | 35:33:00 | 99.52 | 23.73 | 98.98 |
| TPCL-10 | 1908637 | 9976:00:00 | 633:05:00 | 59:30:00 | 46:30:00 | 76:03:00 | 35:33:00 | 99.03 | 21.85 | 98.98 |
| TPCL-11 | 1989617 | 10014:00 | 650:10:00 | 19:25 | 40:59:00 | 76:03:00 | 35:33:00 | 99.45 | 22.77 | 98.98 |
| TPCL-12 | 2041079 | 9994:00:00 | 658:20:00 | 27:55:00 | 44:11:00 | 76:03:00 | 35:33:00 | 99.34 | 23.36 | 98.98 |
| TPCL-13 | 2028881 | 9930:00:00 | 717:33:00 | 23:30 | 38:01:00 | 76:03:00 | 35:33:00 | 99.44 | 23.22 | 98.98 |
| TPCL-14 | 2087615 | 9952:00:00 | 730:09:00 | 4:10 | 40:21:00 | 76:03:00 | 35:33:00 | 99.59 | 23.9 | 98.98 |
| TPCL-15 | 2118969 | 9968:00:00 | 656:23:00 | 49:52:00 | 40:26:00 | 76:03:00 | 35:33:00 | 99.17 | 24.26 | 98.98 |
| TPCL-16 | 2198819 | 9912:00:00 | 621:46:00 | 133:32:00 | 45:21:00 | 76:03:00 | 35:33:00 | 98.36 | 25.17 | 98.98 |
| TPCL-17 | 2311741 | 10031:00 | 623:02:00 | 34:05:00 | 42:40:00 | 76:03:00 | 35:33:00 | 99.3 | 26.46 | 98.98 |
| TPCL-18 | 2306412 | 10004:00 | 630:59:00 | 33:40:00 | 30:32:00 | 76:03:00 | 37:44:00 | 99.41 | 26.4 | 98.96 |
| TPCL-19 | 2006355 | 9922:00:00 | 685:20:00 | 27:59:00 | 69:00:00 | 76:03:00 | 37:44:00 | 99.11 | 22.97 | 98.96 |
| TPCL-38 | 2239479 | 9794:00:00 | 688:45:00 | 123:09:00 | 47:13:00 | 76:03:00 | 78:11:00 | 98.44 | 25.64 | 98.59 |
| TPCL-39 | 2202287 | 9775:00:00 | 761:37:00 | 62:29:00 | 54:07:00 | 76:03:00 | 78:11:00 | 98.93 | 25.21 | 98.59 |
| TPCL-40 | 2086442 | 9872:00:00 | 679:37:00 | 29:00:00 | 56:51:00 | 76:03:00 | 78:11:00 | 99.21 | 23.88 | 98.59 |
| TPCL-41 | 2032898 | 9818:00:00 | 717:42:00 | 28:56:00 | 44:43:00 | 76:03:00 | 78:11:00 | 99.33 | 23.27 | 98.59 |
| TPCL-42 | 2046876 | 9944:00:00 | 649:06:00 | 7:33 | 53:41:00 | 76:03:00 | 78:11:00 | 99.44 | 23.43 | 98.59 |
| TPCL-43 | 2208696 | 9895:00:00 | 660:36:00 | 28:17:00 | 53:18:00 | 76:03:00 | 78:11:00 | 99.25 | 25.28 | 98.59 |
| Total | 52680866 | 248511:00 | 16503:33 | 1215:52:00 | 1133:10:00 | 1901:15:00 | 1172:22:00 | 99.14 | 24.12 | 98.87 |