

**MONITORING REPORT FORM (F-CDM-MR)**
Version 02.0**MONITORING REPORT**

| | |
|--|---|
| Title of the project activity | 75MW wind power project in Maharashtra by Essel Mining Industries Limited |
| Reference number of the project activity | 1115 |
| Version number of the monitoring report | 01 |
| Completion date of the monitoring report | 21-09-2012 |
| Registration date of the project activity | 01-02-2008 |
| Monitoring period number and duration of this monitoring period | Monitoring Period: 04; Duration: 03-01-2012 to 01-08-2012(both days included) |
| Project participant(s) | M/s Essel Mining Industries Limited (EMIL); Kingdom of Spain; Swedish Energy Agency |
| Host Party(ies) | India |
| Sectoral scope(s) and applied methodology(ies) | Sectoral scope : 01 Applied methodology : ACM0002 version 6, Consolidated baseline methodology for grid connected electricity generation from renewable sources |
| Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD | 68655 |
| Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period | 82890 |

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

The project activity is a 75MW wind power project, comprising of 60 WTGs of 1250 KW each) which has been set up in three stages at Dhule and Nandurbar districts of Maharashtra, India. The project activity involves generation of clean electrical energy by harnessing the kinetic energy of wind.

In the absence of the project activity, an equivalent amount of electricity would have been generated from the power plants connected to the grid, majority of whom are based on fossil fuels. The entire power generated is being exported to the state grid maintained by Maharashtra State Electricity Board (MSEB) grid which is a part of NEWNE Grid (formerly known as Western Regional Grid).

The commissioning details are given below:

| Stages | Total Capacity | Commissioning dates |
|-----------|----------------|---|
| Stage I | 15MW | <ul style="list-style-type: none">6 WTGs on 25-03-20056 WTGs on 31-03-2005 |
| Stage II | 30MW | <ul style="list-style-type: none">8 WTGs on 20-09-200515 WTGs on 29-09-20051 WTG on 30-09-2005 |
| Stage III | 30MW | <ul style="list-style-type: none">4 WTGs on 09-12-20057 WTGs on 05-01-200613 WTGs on 07-02-2006 |

The total Emission reduction achieved in fourth Monitoring Period from 03-01-2012 to 01-08-2012 is 82890 tCO₂e. The total Emission reduction achieved in the previous monitoring periods are tabulated below.

| Monitoring period | Emission reduction achieved (tCO ₂ e) |
|--------------------------|--|
| 01-02-2008 to 02-02-2009 | 99201 |
| 03-02-2009 to 01-01-2011 | 197865 |
| 02-01-2011 to 02-01-2012 | 96913 |

Being completely commissioned, all the three phases of the project activity were continually operative during the Monitoring period. The plant witnessed major outages (both forced and planned), the details of which are given in Section B.1 of this report.

A.2. Location of project activity

The project is located in the Dhule and Nandurbar districts of Maharashtra, India.

Dhule is one of the good wind potential areas of the state. Wind farm site is about four hours drive from Diamond city – Surat (Gujarat), the nearest city from the site. The nearest railway station is Nandurbar (50 km) and Chalisgaon (50 km). Nearest airports are Aurangabad/ Baroda (250 km).

The following are the GPS co-ordinates :

| Sr no | Location No | Latitude (N) | Longitude (E) |
|-------|-------------|--------------|---------------|
| 1 | K—14 | 21° 10' | 74° 19' |
| 2 | K—17 | 21° 10' | 74° 19' |
| 3 | K—21 | 21° 11' | 74° 19' |
| 4 | K—24 | 21° 11' | 74° 19' |
| 5 | K—33 | 21° 11' | 74° 20' |
| 6 | K—34 | 21° 11' | 74° 20' |
| 7 | K—35 | 21° 11' | 74° 20' |
| 8 | K—36 | 21° 11' | 74° 20' |
| 9 | K—37 | 21° 11' | 74° 20' |
| 10 | K—38 | 21° 11' | 74° 20' |
| 11 | K—39 | 21° 11' | 74° 20' |
| 12 | K—40 | 21° 11' | 74° 20' |
| 13 | K—46 | 21° 12' | 74° 19' |
| 14 | K—48 | 21° 11' | 74° 20' |
| 15 | K—50 | 21° 11' | 74° 19' |
| 16 | K—79 | 21° 12' | 74° 21' |
| 17 | K-107 | 21° 13' | 74° 19' |
| 18 | K-112 | 21° 13' | 74° 20' |
| 19 | K-167 | 21° 13' | 74° 17' |
| 20 | K-168 | 21° 13' | 74° 17' |
| 21 | K-176 | 21° 13' | 74° 17' |
| 22 | K-201 | 21° 11' | 74° 16' |
| 23 | K-203 | 21° 11' | 74° 16' |
| 24 | K-204 | 21° 12' | 74° 15' |
| 25 | K-205 | 21° 12' | 74° 16' |
| 26 | K-206 | 21° 12' | 74° 15' |
| 27 | K-209 | 21° 12' | 74° 15' |
| 28 | K-212 | 21° 12' | 74° 15' |
| 29 | K-215 | 21° 12' | 74° 16' |
| 30 | K-216 | 21° 12' | 74° 15' |
| 31 | K-218 | 21° 12' | 74° 16' |
| 32 | K-219 | 21° 13' | 74° 15' |



| | | | |
|----|-------|---------|---------|
| 33 | K-220 | 21° 13' | 74° 15' |
| 34 | K-221 | 21° 13' | 74° 15' |
| 35 | K-222 | 21° 13' | 74° 15' |
| 36 | K-227 | 21° 13' | 74° 16' |
| 37 | K-352 | 21° 14' | 74° 20' |
| 38 | K-353 | 21° 14' | 74° 20' |
| 39 | K-354 | 21° 14' | 74° 21' |
| 40 | K-355 | 21° 14' | 74° 21' |
| 41 | K-356 | 21° 14' | 74° 20' |
| 42 | K-360 | 21° 14' | 74° 21' |
| 43 | K-362 | 21° 14' | 74° 20' |
| 44 | K-363 | 21° 14' | 74° 21' |
| 45 | K-364 | 21° 14' | 74° 21' |
| 46 | K-365 | 21° 14' | 74° 20' |
| 47 | K-366 | 21° 14' | 74° 21' |
| 48 | K-368 | 21° 15' | 74° 21' |
| 49 | K-370 | 21° 14' | 74° 20' |
| 50 | K-371 | 21° 15' | 74° 20' |
| 51 | K-372 | 21° 15' | 74° 21' |
| 52 | K-374 | 21° 15' | 74° 20' |
| 53 | K-377 | 21° 15' | 74° 20' |
| 54 | K-378 | 21° 15' | 74° 21' |
| 55 | K-379 | 21° 15' | 74° 20' |
| 56 | K-381 | 21° 15' | 74° 21' |
| 57 | K-382 | 21° 15' | 74° 20' |
| 58 | K-385 | 21° 15' | 74° 21' |
| 59 | K-386 | 21° 16' | 74° 21' |
| 60 | K-388 | 21° 16' | 74° 21' |

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 Essel Mining Industries Limited (EMIL) (Private) | No |
| Spain | Kingdom of Spain | Yes |
| Sweden | Swedish Energy Agency | Yes |

A.4. Reference of applied methodology

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

Reference: Approved consolidated baseline methodology ACM0002/ Version 06

Sectoral Scope: 01

Tools: Tool to calculate the emission factor for an electricity system version 01

A.5. Crediting period of project activity

The crediting period is from 01-02-2008 to 31-01-2018 (10 years, fixed)

Starting Date: 01-02-2008

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

The commissioning details are given below:

| Stages | Total Capacity | Commissioning dates |
|-----------|----------------|---|
| Stage I | 15MW | <ul style="list-style-type: none">6 WTGs on 25-03-20056 WTGs on 31-03-2005 |
| Stage II | 30MW | <ul style="list-style-type: none">8 WTGs on 20-09-200515 WTGs on 29-09-20051 WTG on 30-09-2005 |
| Stage III | 30MW | <ul style="list-style-type: none">4 WTGs on 09-12-20057 WTGs on 05-01-200613 WTGs on 07-02-2006 |

Details of the Wind Turbine Generators:

| Serial No | Location No | Generator No | Date of Commissioning |
|-----------|-------------|--------------|-----------------------|
| Stage I | | | |
| 1 | K14 | 478673 | 25-03-2005 |
| 2 | K17 | 479432 | 31-03-2005 |
| 3 | K21 | 479433 | 31-03-2005 |
| 4 | K24 | 479247 | 31-03-2005 |
| 5 | K33 | 479249 | 31-03-2005 |
| 6 | K34 | 478680 | 25-03-2005 |
| 7 | K35 | 479157 | 25-03-2005 |
| 8 | K36 | 478702 | 25-03-2005 |
| 9 | K37 | 478861 | 25-03-2005 |



| | | | |
|------------------|------|----------|------------|
| 10 | K38 | 478862 | 25-03-2005 |
| 11 | K39 | 479158 | 31-03-2005 |
| 12 | K40 | 478930 | 31-03-2005 |
| Stage II | | | |
| 13 | K219 | 64016841 | 29-09-2005 |
| 14 | K220 | 64017874 | 29-09-2005 |
| 15 | K221 | 64018485 | 29-09-2005 |
| 16 | K222 | 64015302 | 29-09-2005 |
| 17 | K216 | 64020221 | 29-09-2005 |
| 18 | K168 | 64019647 | 29-09-2005 |
| 19 | K227 | 64015942 | 29-09-2005 |
| 20 | K167 | 5134897 | 20-09-2005 |
| 21 | K209 | 5136457 | 20-09-2005 |
| 22 | K212 | 5136465 | 20-09-2005 |
| 23 | K215 | 64011924 | 20-09-2005 |
| 24 | K201 | 64015940 | 29-09-2005 |
| 25 | K203 | 64019648 | 29-09-2005 |
| 26 | K204 | 64018482 | 29-09-2005 |
| 27 | K205 | 470663 | 29-09-2005 |
| 28 | K218 | 64017529 | 30-09-2005 |
| 29 | K206 | 5136502 | 29-09-2005 |
| 30 | K46 | 5136502 | 20-09-2005 |
| 31 | K48 | 64017874 | 29-09-2005 |
| 32 | K50 | 64015302 | 29-09-2005 |
| 33 | K112 | 5136461 | 20-09-2005 |
| 34 | K176 | 64017129 | 29-09-2005 |
| 35 | K107 | 64014828 | 20-09-2005 |
| 36 | K79 | 480645 | 20-09-2005 |
| Stage III | | | |
| 37 | K356 | 64021776 | 09-12-2005 |
| 38 | K362 | 64021435 | 09-12-2005 |
| 39 | K364 | 64021773 | 09-12-2005 |
| 40 | K365 | 64021434 | 09-12-2005 |
| 41 | K352 | 64021431 | 05-01-2006 |
| 42 | K353 | 64022374 | 05-01-2006 |
| 43 | K354 | 64021775 | 05-01-2006 |
| 44 | K360 | 64021432 | 05-01-2006 |
| 45 | K363 | 64022375 | 05-01-2006 |
| 46 | K366 | 64021774 | 05-01-2006 |
| 47 | K368 | 64022239 | 05-01-2006 |
| 48 | K355 | 64026133 | 07-02-2006 |
| 49 | K370 | 64027704 | 07-02-2006 |
| 50 | K371 | 64022243 | 07-02-2006 |



| | | | |
|----|------|----------|------------|
| 51 | K372 | 64022244 | 07-02-2006 |
| 52 | K374 | 64022377 | 07-02-2006 |
| 53 | K377 | 64026127 | 07-02-2006 |
| 54 | K378 | 64022241 | 07-02-2006 |
| 55 | K379 | 64026703 | 07-02-2006 |
| 56 | K381 | 64020225 | 07-02-2006 |
| 57 | K382 | 64026704 | 07-02-2006 |
| 58 | K385 | 64025701 | 07-02-2006 |
| 59 | K386 | 64026128 | 07-02-2006 |
| 60 | K388 | 64021777 | 07-02-2006 |

The project activity was in operation continuously with regular maintenance and inspection. The following energy meters were changed during the Monitoring period :

| Feeder No | Old meter no | New meter no | Date of installation |
|--------------------|--------------|--------------|----------------------|
| Gangapur 6 - main | 4961750 | 14796472 | 26.07.12 |
| Gangapur 6 - Check | 4961751 | 14796471 | 26.07.12 |

The following were the major breakdowns during the Monitoring period :

| WTG No | Breakdown date | Period (days) | Remarks |
|--------|----------------|------------------|----------------------------|
| K381 | 05-04-2012 | 7 | Machine blades replaced |
| K14 | 01-02-2012 | 6 | Slewing repositioning done |
| K353 | 07-03-2012 | 5 | Fluid coupling replaced |

The above breakdowns had no impact on the applicability of the methodology.

The project activity was in operation continuously with regular maintenance and inspection. There were no replacements or exchange of any major equipment during the monitoring period which may impact the applicability of the methodology or the revised monitoring plan. The calibration details of energy meters are given below in table B.1.a below.

B.2. Post registration changes

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

Not applicable

B.2.2. Corrections

Not applicable

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

The monitoring plan of the registered PDD had been revised which was approved by UNFCCC on 09/05/2010.

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

Not applicable

B.2.5. Changes to start date of crediting period

Not applicable

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

Not applicable

SECTION C. Description of monitoring system

As per the applied monitoring methodology to the project, the project participants need to monitor the following parameters on continuous basis to monitor the net electricity EG_y supplied from the project activity:

$EG_{TOTAL,i}$ = Total Electricity exported to MSEB (MSEDCL) facility by all WTGs (WTGs of project proponent as well as of other promoters) connected to the feeder i (kWh)

$EG_{AUXTOTAL,i}$ = Total Electricity imported by all WTGs (WTGs of project proponent as well as of other promoters) connected to the feeder i from MSEB (MSEDCL) (kWh)

$EG_{CONTROLLER,,i,j}$ = Electricity generation at the controller of individual WTG, j, of the project proponent connected to feeder i (kWh)

$EG_{CONTROLLERTOTAL,i}$ = Total electricity generation at the controller of all WTGs (WTGs of project proponent as well as of other promoters) connected to the feeder i (kWh)

$EG_{GEN,y,i}$ = Total electricity generation by the WTGs of the project proponent connected to the feeder, i (apportioned) (kWh).

$EG_{AUX,y,i}$ = Auxiliary consumption by the WTGs of the project proponent connected to the feeder, i (apportioned) (kWh).

$EG_{GEN,y}$ = Total electricity generation by all the wind turbines of project proponent (kWh)

$EG_{AUX,y}$ = Auxiliary consumption by all the wind turbines of the project proponent (kWh)

Now,

$$EG_{GEN,y,i} = (\sum EG_{CONTROLLER,i,j} / EG_{CONTROLLER,TOTAL,i}) * EG_{GEN,TOTAL,i}$$

$$EG_{AUX,y,i} = (\sum EG_{CONTROLLER,i,j} / EG_{CONTROLLER,TOTAL,i}) * EG_{AUX,TOTAL,i}$$

Then,

$$EG_{GEN,y} = \sum EG_{GEN,y,i}$$

$$EG_{AUX,y} = \sum EG_{AUX,y,i}$$

Where,

i - represents the feeders

j - represents the WTGs of the project proponent.

The net electricity supply is calculated as

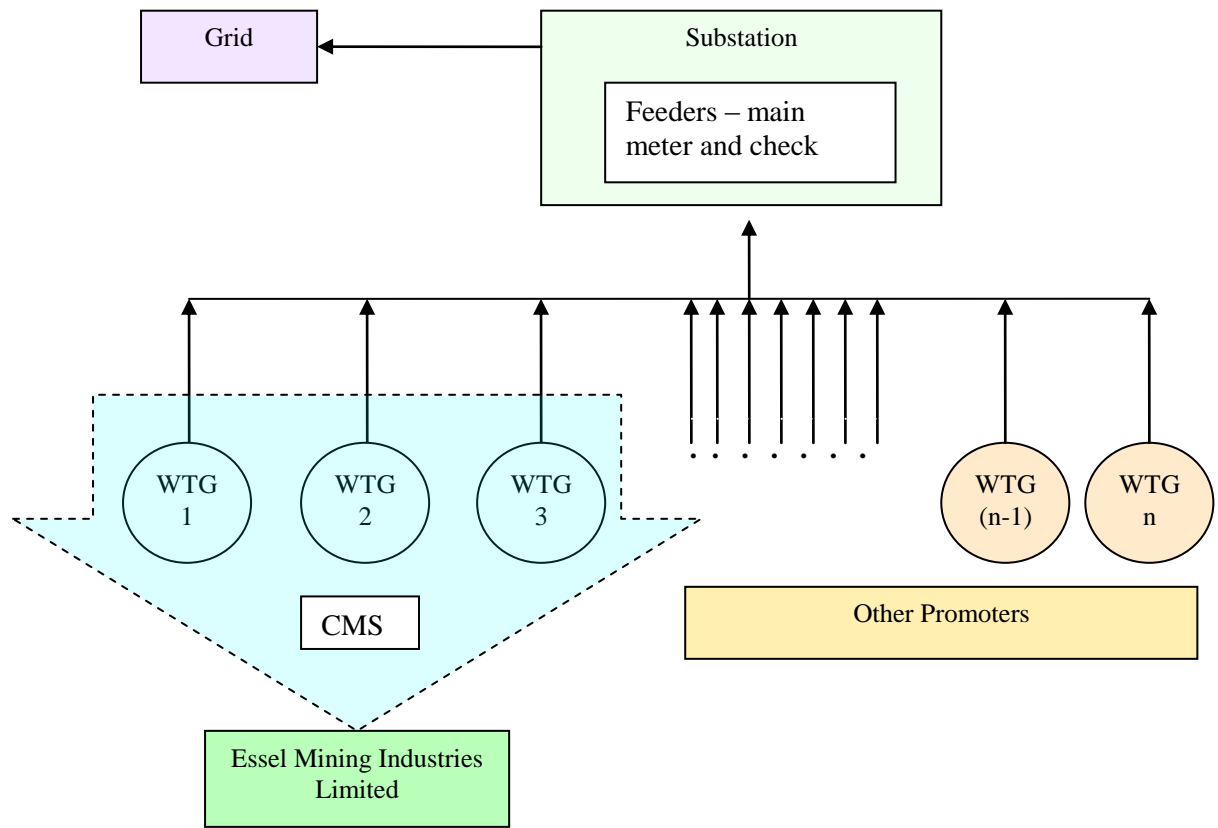
$$EG_y = EG_{GEN,y} - E_{AUX,y}$$

The monitoring of $EG_{GEN,y}$ and $EG_{AUX,y}$ would be as per the details provided in the Article 11 of the Power Purchase Agreement signed between the MSEB and EMIL.

As per Article 11, section 11.05 of PPA, “Wherever more than one Power Producer(s) are delivering energy produced by them using common evacuation system and through the common Metering equipment, then they shall identify a common agency responsible for joint meter reading with MSEB. The Joint Meter Reading taken at the common evacuation system shall be supported by meter readings of individual power producers using such common evacuation system. Based on this breakup, limited to energy delivered, the power generated from individual power plant shall be certified by MSEB”.

The apportioning of electricity generated by the entire wind farm is entirely under the jurisdiction of the electricity board. The project proponent has no role in computing and furnishing the apportioned electricity generated for themselves or any other promoter. The above calculation for deriving the apportioned electricity generated by the project proponent has been included only to bring clarity to the apportioning and overall monitoring procedure followed by the project proponent for the project activity.

Diagrammatic Representation:



Analytical representation:

EG_{GEN,y}

Let us assume there are 'n' WTGs,

The power generated from individual power plant (meter readings of individual power producers hereafter referred to as controller generation of each WTG) be X_i .

Therefore,

Controller generation for WTG 1 = X_1

Controller generation for WTG 2 = X_2

Controller generation for WTG n = X_n

Now, $X_1 + X_2 + X_3 + \dots + X_n = X$ (say)

Let the energy delivered (Joint Meter Reading taken at the common evacuation system) be Y then as per article 11 of the PPA,

Y_i , electricity generation of each WTG at (S/s feeder) is equal to the ratio of respective controller generation at that WTG and total controller generation of all WTGs connected to the feeder (common evacuation system) multiplied by the total net generation (S/s feeder) Therefore,



$$Y_i = (X_i/X) * Y$$

The operation and maintenance of the wind farm has been outsourced to Suzlon. All the WTGs at the site are monitored from the Central Monitoring Station (CMS) at the wind farm, where electricity generation from each WTG is continuously monitored. The CMS at the wind farm reports to the main CMS at Pune, where the daily generation report is prepared and sent to EMIL by the respective CRM (Customer Relationship Management) manager.

The electricity generation reports on joint meter reading are generated by MSEDCL and sent to EMIL through Suzlon (O&M service provider) on monthly basis. Upon receipt of reports, EMIL generates invoices on sale of electricity and sends to MSEDCL via Suzlon. Thereafter, MSEDCL makes payments against the invoices within 3 months directly to EMIL.

Table for detailed description of energy meters used for monitoring of EGGENTOTAL_i and EGAUXTOTAL_i - Table B.1. a :

| Seria I No | Main Meter No | Check Meter No | Feeder No | Accu racy Clas s | Frequency of calibration /testing ¹ | Sub Station | Dates of Calibration/Te sting | | Due date of calibration |
|------------|---------------|----------------|------------|---------------------------|---|----------------|-------------------------------------|--|----------------------------|
| 1 | 4890617 | 4890556 | Sakri I | 0.2 | Annually | Sakri | 10-08-2011 to 24-08-2011 | | 10-08-2012 |
| 2 | 4890618 | 4890561 | Sakri II | 0.2 | Annually | Sakri | | | |
| 3 | 4725791 | 4763795 | Jamde 9 | 0.2 | Annually | Jamde | | | |
| 4 | 4738077 | 4738074 | Jamde 7 | 0.2 | Annually | Jamde | | | |
| 5 | 4862465 | 4725796 | Jamde 3 | 0.2 | Annually | Jamde | | | |
| 6 | 4890558 | 4725804 | Jamde 2 | 0.2 | Annually | Jamde | | | |
| 7 | 4890559 | 4725809 | Jamde 12 | 0.2 | Annually | Jamde | | | |
| 8 | 4725799 | 4725805 | Jamde 11 | 0.2 | Annually | Jamde | | | |
| 9 | 4738079 | 4738067 | Jamde 8 | 0.2 | Annually | Jamde | | | |
| 10 | 4725784 | 4738059 | Jamde 15 | 0.2 | Annually | Jamde | | | |
| 11 | 4725778 | 4725803 | Jamde 6 | 0.2 | Annually | Jamde | | | |
| 12 | 4890557 | 4738078 | Jamde 16 | 0.2 | Annually | Jamde | | | |
| 13 | 4961777 | 4863440 | Valve VII | 0.2 | Annually | Valve | | | |
| 14 | 4961750* | 4961751** | Gangapur 6 | 0.2 | Annually | Gangapur | | | |
| | 14796472 | 14796471 | | | | | | | |
| | | | | | | | | | |

*Meter no 14796472 was installed on 26-07-2012 replacing the old meter no 4961750.

** Meter no 14796471 was installed on 26-07-2012 replacing the old meter no 4961751.

QA/QC procedures:

Essel Mining & Industries Ltd has established, documented and implemented Integrated Management Systems. The company maintains and continually improves the effectiveness of QMS, EMS and OHSMS in accordance with the requirements of ISO 9001:2008, ISO 14001:2004 and OHSAS 18001:2007. The company has developed “Documentation structure” and it comprises of:

- Level1- Manual
- Level 2- Process approach and Procedures
- Level 3- Specifications, Process Flow Diagrams, Aspect and Hazard Register, Legal Register, Emergency Plan, Work Instructions and Management Programmes
- Level 4- Formats, Registers, Tags, Labels, Files and Records

Integrated Management Systems Manual describes the organization structure with responsibilities; and measures for documentation, implementation & control of the system. Integrated Management

¹ Calibration frequency of 1 year has been mentioned in the Power Purchase Agreement signed between MSEDCL and project proponent

Procedures provide information and instructions for achieving and maintaining functional controls, meeting the requirements of International Standard ISO9001: 2000, ISO 14001:2004 & OHSAS 18001:2007 and the organization's IMS Policy. Head of the departments (HODs) effectively implement these procedures into practice, involving all personnel concerned.

Roles and Responsibilities:

The entire operation and maintenance of the project activity has been outsourced to Suzlon, which is also the equipment supplier. The monitoring of export and import of electricity would be as per the details provided in the Article 11 of the Power Purchase Agreement signed between the MSEB and EMIL, which clearly identifies the following:

Metering and recording process of power generation and consumption data

Calibration of metering instruments

Validation of data

Recording and approving authority

EMIL has outsourced the operations and monitoring the performances of the WTGs to Suzlon Infrastructure Services Limited who sends daily and monthly performance records to EMIL. All the WTGs at the site are connected to a Central Monitoring Station of Suzlon being operated from Pune wherein data are directly captured through digital system. The captured data are then directly uploaded to the CRM (customer relationship management) system. From CRM the daily generation reports are directly sent to EMIL on a daily basis. A CRM manager deputed by Suzlon, is responsible for the monitoring of the WTGs. EMIL has daily communication with CRM manager. The electricity generation reports on joint meter reading are generated by MSEDCL and send to EMIL through Suzlon (O&M service provider) on monthly basis.

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

| Data/Parameter | EFOM,y |
|-------------------|--|
| Unit | tCO ₂ /MWh |
| Description | Operating Margin emission factor for western regional grid |
| Source of Data | Computed from data sourced from Website of Central Electricity Authority of India |
| Value (s) applied | 0.99tCO ₂ /MWh |
| Purpose of data | Calculated as per ACM0002 with 3years vintage (2002-2003, 2003-2004, 2004- 2005) data obtained from CEA database on CO ₂ baseline for Indian Power Sector. Computed once during PDD finalization (ex-ante). |



| | |
|--------------------|---|
| Additional comment | Records to be archived for 12years from the start of the crediting period either on paper or in electronic media. |
|--------------------|---|

| | |
|-----------------------|--|
| Data/Parameter | E_{FBM,y} |
| Unit | tCO ₂ /MWh |
| Description | Build Margin emission factor for western regional grid |
| Source of Data | Computed from data sourced from Website of Central Electricity Authority of India |
| Value (s) applied | 0.78tCO ₂ /MWh |
| Purpose of data | Calculated as per ACM0002 with vintage (2004-2005) data obtained from CEA database on CO ₂ baseline for Indian Power Sector. Computed once during PDD finalization (ex-ante). |
| Additional comment | Records to be archived for 12years from the start of the crediting period either on paper or in electronic media. |

| | |
|-----------------------|---|
| Data/Parameter | E_{Fy} |
| Unit | tCO ₂ /MWh |
| Description | Combine Margin CO ₂ emission factor for western regional grid |
| Source of Data | Estimated figure based on 75% of OM and 25% of BM values calculated using data obtained from CEA database on CO ₂ baseline emission factor for Indian Power Sector. |
| Value (s) applied | 0.940tCO ₂ /MWh |
| Purpose of data | Calculated as per ACM0002 with 3years vintage data and option of ex ante calculation based on “75% of OM and 25% of BM values approach”. Computed once during PDD finalization. (ex-ante) |
| Additional comment | Records to be archived for 12years from the start of the crediting period either on paper or in electronic media. |

D.2. Data and parameters monitored

| | |
|---------------------------------|---|
| Data/Parameter | E_{Gy} |
| Unit | MWh/yr |
| Description | Net Electricity supplied to MSEB facility |
| Measures / calculated / default | Calculated |
| Source of Data to be used | Joint Meter Readings (JMRs) and Invoices available at project site and at EMIL Corporate Office |
| Value(s) of monitored parameter | 88181 (Details as per table D-3) |
| Monitoring equipment | This is calculated parameter; hence no monitoring equipment is |



| | |
|---|--|
| | required. |
| Measuring/ Reading/ Recording frequency | Monthly |
| Calculation method (if applicable) | As per Section C above and detail calculation is given in ER computation sheet. |
| QA/QC procedures | Uncertainty level of data: Low; This data can be cross referred with the invoices raised to MSEB by EMIL and payment against the invoice. |
| Purpose of data | Baseline emission calculation |
| Additional comment | NA |

| | |
|---|--|
| Data/Parameter | EGGENTOTAL,i |
| Unit | KWh |
| Description | Total Electricity exported to MSEB (MSEDCL) facility by all WTGs (WTGs of project proponent as well as of other promoters) connected to the feeder, i. |
| Measures / calculated / default | Measured |
| Source of Data to be used | Monthly Generation Report obtained from Suzlon Infrastructure Services Limited |
| Value(s) of monitored parameter | 264480814 (Details as per table D-3) |
| Monitoring equipment | The measurement is done through the energy meters, having accuracy class of 0.2s, for each feeder at the grid sub-station. The meters are duly approved, tested and sealed by the electricity board. The meter details (Sr. No., calibration details, etc) are provided in Section C above. Monthly readings are taken jointly by the electricity board and the authorized representative of the project proponent. These readings are furnished by the electricity board in the master JMR ² . Details as per Table B.1.a above |
| Measuring/ Reading/ Recording frequency | Continuous measuring and monthly recording |
| Calculation method (if applicable) | Not applicable |
| QA/QC procedures | Uncertainty level of data: Low; As per the power purchase agreement, the electricity board carries out the calibration and maintenance of meters. Calibration is done annually. |
| Purpose of data | Baseline emission calculation |
| Additional comment | NA |

| | |
|-----------------------|--|
| Data/Parameter | EGAUXTOTAL,i |
| Unit | KWh |
| Description | Total Electricity imported from MSEB (MSEDCL) by all WTGs (WTGs of project proponent as well as of other promoters) connected to |

² Master JMR is issued by MSEDCL to Suzlon Energy Limited for the entire windfarm, wherein, monthly energy generation details for all the promoters are mentioned. This report is not under the jurisdiction of the project proponent and available only at the plant site.



| | |
|---|---|
| | the feeder, i. |
| Measures / calculated / default | Measured |
| Source of Data to be used | Monthly Generation Report obtained from Suzlon Infrastructure Services Limited |
| Value(s) of monitored parameter | 680804 (Details as per table D-3) |
| Monitoring equipment | The measurement is done through the energy meters, having accuracy class of 0.2s, for each feeder at the grid sub-station. The meters are duly approved, tested and sealed by the electricity board. The meter details (Sr. No., calibration details, etc) are provided in Section C above. Monthly readings are taken jointly by the electricity board and the authorized representative of the project proponent. These readings are furnished by the electricity board in the master JMR. Details as per Table B.1.a above |
| Measuring/ Reading/ Recording frequency | Continuous measuring and monthly recording |
| Calculation method (if applicable) | Not applicable |
| QA/QC procedures | Uncertainty level of data: Low; As per the power purchase agreement, the electricity board carries out the and maintenance of meters. is done annually. |
| Purpose of data | Baseline emission calculation |
| Additional comment | NA |

| | |
|---|--|
| Data/Parameter | EGCONTROLLER,i,j |
| Unit | KWh |
| Description | Electricity generation at the controller of individual WTG, j, of the project proponent connected to feeder, i. |
| Measures / calculated / default | Measured |
| Source of Data to be used | Monthly Generation Report obtained from Suzlon Infrastructure Services Limited |
| Value(s) of monitored parameter | 90885442 (Details as per table D-3) |
| Monitoring equipment | The measurement is done through the controller at each WTG. Recording of the same is done at the Central Monitoring Station (CMS) in the windfarm. This data is provided to MSEDCL on a monthly basis for computation of electricity generation by individual promoters. All the WTGs in the windfarm are monitored from the CMS |
| Measuring/ Reading/ Recording frequency | Continuous measuring and monthly recording |
| Calculation method (if applicable) | Not applicable |
| QA/QC procedures | Uncertainty level of data: Low; This data can be cross referred with the JMR issued by MSEDCL (MSEDCL) to EMIL. |
| Purpose of data | Baseline emission calculation |
| Additional comment | NA |



| | |
|--|--|
| Data/Parameter | EG_{CONTROLLER}TOTAL,i |
| Unit | KWh |
| Description | Total of electricity generation at the controller of all WTGs (WTGs of project proponent as well as of other promoters) connected to the feeder, i). |
| Measures / calculated / default | Measured |
| Source of Data to be used | Monthly Generation Report obtained from Suzlon Infrastructure Services Limited |
| Value(s) of monitored parameter | 271506637 (Details as per table D-3) |
| Monitoring equipment | <p>The measurement is done through the controller at each WTG. Recording of the same is done at the Central Monitoring Station (CMS) in the windfarm. This data is provided to MSEDCL on a monthly basis for computation of electricity generation by individual promoters.</p> <p>All the WTGs in the windfarm are monitored from the CMS</p> <p>This data is the summation of electricity generation at the controller of all WTGs (WTGs of project proponent as well as of other promoters) connected to the feeder, i.</p> |
| Measuring/ Reading/ Recording frequency | Continuous measuring and monthly recording |
| Calculation method (if applicable) | Not applicable |
| QA/QC procedures | <p>Uncertainty level of data: Low;</p> <p>This data can be verified with the master JMR for the entire windfarm issued by MSEDCL (MSEDCL) to Suzlon.</p> |
| Purpose of data | Baseline emission calculation |
| Additional comment | NA |

**Monitored Results:**

The details of the net electricity generated from the project activity for the monitoring period is as given in table below:

| |
|--|
| Table for details of Monitored Results – Table – D3 |
|--|

| Months | EG _{CONTROLLER,TOTAL,i} (kWh) | EGGEN,TOTAL,i (kWh) | EGAUX,TOTAL,i (kWh) | EGCONTROLLER,i,j (kWh) | Total Export (kWh) | Total Import (kWh) | EG _y , Net Electricity supplied to MSEB facility (kWh) |
|--------------|---|------------------------|------------------------|---------------------------|-----------------------|-----------------------|--|
| Jan '12 | 8817191 | 8329020 | 191630 | 2971315 | 2808455 | 64228 | 2744227 |
| Feb '12 | 10812319 | 10315440 | 192454 | 3657843 | 3488288 | 65433 | 3422855 |
| Mar '12 | 16061436 | 15433140 | 186796 | 5459467 | 5245569 | 61402 | 5184167 |
| April '12 | 30053378 | 29280740 | 56482 | 10115513 | 9844276 | 19538 | 9824738 |
| May '12 | 65255171 | 63838954 | 11538 | 22064162 | 21545759 | 2382 | 21543377 |
| June '12 | 73995078 | 72319520 | 24082 | 24746957 | 24146790 | 8550 | 24138240 |
| July '12 | 66512064 | 64964000 | 17822 | 21870185 | 21330762 | 7490 | 21323272 |
| Total | 271506637 | 264480814 | 680804 | 90885442 | 88409899 | 229023 | 88180876 |

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**

$$BE_y = EG_y \times EF_y$$

where,

BE_y = Baseline Emissions due to displacement of electricity during the year y (in tons of CO₂)

EG_y = Net units of electricity substituted in the grid during the year y (in MWh)

EF_y = Emission Factor of the grid (in tCO₂/ MWh) and

y is any year within the crediting period of the project activity

Carbon dioxide emission factor as per the baseline adopted, $EF_y = 0.940 \text{ tCO}_2/\text{MWh}$

Net Electricity supplied to MSEB facility, $EG_y = 88180876 \text{ kWh}$

Baseline emissions is

$$BE_y = EG_y \times EF_y = 88180.876 \text{ MWh} \times 0.94 \text{ tCO}_2/\text{MWh} = 82890 \text{ tCO}_2\text{e (rounded down)}$$

(Detailed calculation is given in ER computation sheet)

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

Project Emissions, $PE_y = \text{NIL tCO}_2\text{e}$

E.3. Calculation of leakage

Leakage Emissions, $L_y = \text{NIL tCO}_2\text{e}$

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

| Time Period | Baseline emissions or baseline net GHG removals by sinks (tCO ₂ e) | Project emissions or actual net GHG removals by sinks (tCO ₂ e) | Leakage (tCO ₂ e) | Emission reductions or net anthropogenic GHG removals by sinks (tCO ₂ e) |
|--------------|---|--|------------------------------|---|
| Total | 82890 | 0 | 0 | 82890 |

**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 (tCO ₂ e) | 68655 | 82890 |

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

The actual values achieved is higher than the pro-rated estimated value because the actual value covers only the high wind period whereas the estimated value above is calculated on pro-rata basis for the whole year.

History of the document

| Version | Date | Nature of revision |
|---|--------------------------------|--|
| 02.0 | EB 66 13 March 2012 | Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20). |
| 01 | EB 54, Annex 34 28 May 2010 | Initial adoption. |
| Decision Class: Regulatory Document Type: Form Business Function: Issuance | | |