



Monitoring report form (Version 03.1)

Monitoring report

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| Title of the project activity | GEI Wind Power Project in Karnataka, India |
| Reference number of the project activity | 4144 |
| Version number of the monitoring report | 03 |
| Completion date of the monitoring report | 10/04/2013 |
| Registration date of the project activity | 09/03/2011 |
| Monitoring period number and duration of this monitoring period | Second, 01/10/2011-31/12/2012 (Inclusive of first and last day) |
| Project participant(s) | Generacion Eolica India Limited Kingdom of Spain Swedish Energy Agency |
| Host Party(ies) | Govt. of India (Host) |
| Sectoral scope(s) and applied methodology(ies) | Energy industries (renewable/ non-renewable sources) Title: Consolidated baseline methodology for grid-connected electricity generation from renewable sources Reference: Approved consolidated baseline methodology ACM0002 (Version 11, EB 52) |
| Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD | 80426 tCO ₂ |
| Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period | 64989 tCO ₂ |

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

(a) >> *Purpose of the project activity and the measures taken for GHG emission reductions or net anthropogenic GHG removals by sinks;*

The project activity is the successful installation and generation of 31.2 MW through efficient utilization of renewable energy source viz., wind energy at Harthi, Kurtakoti and Malasamudra villages of Gadag district in Karnataka in order to generate electricity to be fed to Southern grid.

The purpose of the project activity is to utilize renewable wind energy for generation of electricity. The project activity replaces anthropogenic emissions of greenhouse gases (GHGs) into the atmosphere, by displacing the equivalent amount of electricity generation through the operation of existing fuel mix in the grid comprising mainly fossil fuel based power plants and future capacity expansions connected to the grid.

In the absence of the project activity the equivalent amount of electricity would have been generated from the connected/ new power plants in the Southern grid, which are/ will be predominantly based on fossil fuels. Whereas the electricity generation from operation of WECs is emission free. As per the applicable methodology, the baseline scenario for the project activity is the grid based electricity system, which is also the pre-project scenario.

(b) *Brief description of the installed technology and equipments;*

The project activity involves 39 WECs of Enercon make (800 kW, E-53) with internal electrical lines connecting the project activity with local evacuation facility. The WECs generates 3-phase power at 400V, which is stepped up to 33 KV at the Project site and further stepped up to 220 KV at the Receiving sub- station for the purpose of interconnection with the KPTCL/HESCOM grid at the sub-station of the KPTCL/HESCOM. 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 life time of the WEC is 20 years as provided by the equipment supplier. Enercon (India) Ltd (EIL) is the turbine supplier and is the operations and maintenance contractor.

(c) *Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods, etc.);*

The commissioning dates of all the WTGs installed in the project activity have been provided in the table below:

| Sl. No. | Location No. | No. of WTGs | Commissioning Date | Village |
|---------|--------------|-------------|--------------------|---------|
| 1 | 170a | 4 | 17/12/2007 | Harthi |

| | | | | |
|----|------|----|------------|-------------|
| 2 | 170 | | | |
| 3 | 171 | | | |
| 4 | 236 | | | |
| 5 | 229 | 6 | 17/03/2008 | Malasamudra |
| 6 | 181 | | | |
| 7 | 180 | | | |
| 8 | 163 | | | Kurthkoti |
| 9 | 226 | | | Malasamudra |
| 10 | 230 | | | |
| 11 | 173 | 8 | 25/06/2008 | Harthi |
| 12 | 231 | | | Malasamudra |
| 13 | 174 | | | Harthi |
| 14 | 233 | | | |
| 15 | 232 | | | |
| 16 | 234 | | | |
| 17 | 169A | | | |
| 18 | 237 | | | |
| 19 | 168 | 10 | 07/07/2008 | Kurthkoti |

| | | | | |
|----|-----|---|------------|-------------|
| 20 | 169 | | | Harthi |
| 21 | 235 | | | |
| 22 | 136 | | | |
| 23 | 137 | | | |
| 24 | 138 | | | |
| 25 | 139 | | | |
| 26 | 140 | | | |
| 27 | 141 | | | |
| 28 | 179 | 4 | 11/09/2008 | Malasamudra |
| 29 | 228 | | | Malasamudra |
| 30 | 172 | | | Harthi |
| 31 | 227 | | | Malasamudra |
| 32 | 239 | 4 | 29/09/2008 | Harthi |
| 33 | 167 | | | Kurthkoti |
| 34 | 176 | | | Harthi |
| 35 | 178 | | | Kurthkoti |
| 36 | 164 | 3 | 10/10/2008 | Kurthkoti |
| 37 | 165 | | | Kurthkoti |

| | | | | |
|--------------|-----|-----------|--|-------------|
| 38 | 166 | | | Kurthkoti |
| 39 | 177 | | | Malasamudra |
| Total | | 39 | | |

(d) *Total GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period.*

The total emission reductions achieved under this monitoring period (01/10/2011-31/12/2012) are **64989 tCO₂**.

A.2. Location of project activity

(a) *Host Party(ies);*

India

(b) *Region/State/Province, etc.;*

Karnataka State

(c) *City/Town/Community, etc.;*

The project activity is located at Harthi, Kurthkoti & Malasamudra villages in Gadag district of Karnataka state in India.

(d) *Physical/ Geographical location.*

| Sl. No. | Location No. | No. of WTGs | Village | Longitude | Latitude |
|---------|--------------|-------------|-------------|-------------|-------------|
| 1 | 170a | 4 | Harthi | 15°20'53" | 75°34'29.2" |
| 2 | 170 | | | 15°20'59" | 75°34'27.5" |
| 3 | 171 | | | 15°21'5.8" | 75°34'26.1" |
| 4 | 236 | | | 15°21'14.3" | 75°34'38.8" |
| 5 | 229 | 6 | Malasamudra | 15°21'59.9" | 75°34'23" |
| 6 | 181 | | | 15°22'16.6" | 75°33'57.8" |

| | | | | | | |
|--|----|------|----|-------------|-------------|-------------|
| | 7 | 180 | | | 15°22'10.4" | 75°34'0.9" |
| | 8 | 163 | | Kurthkoti | 15°22'8.3" | 75°33'44.8" |
| | 9 | 226 | | Malasamudra | 15°22'19.2" | 75°34'13.5" |
| | 10 | 230 | | | 15°21'52.7" | 75°34'23.9" |
| | 11 | 173 | 8 | Harthi | 15°21'19.4" | 75°34'19.9" |
| | 12 | 231 | | Malasamudra | 15°21'46.8" | 75°34'27.7" |
| | 13 | 174 | | Harthi | 15°21'31.5" | 75°34'15.5" |
| | 14 | 233 | | | 15°21'33.3" | 75°34'30.6" |
| | 15 | 232 | | | 15°21'39.6" | 75°34'28.6" |
| | 16 | 234 | | | 15°21'27.8" | 75°34'33.5" |
| | 17 | 169A | | | 15°21'20" | 75°34'3.7" |
| | 18 | 237 | | | 15°21'8.1" | 75°34'41.3" |
| | 19 | 168 | 10 | Kurthkoti | 15°21'35.7" | 75°33'56.8" |
| | 20 | 169 | | Harthi | 15°21'29.5" | 75°34'1.5" |
| | 21 | 235 | | | 15°21'21.3" | 75°34'39.2" |

| | | | | | | |
|--|----|-----|---|-------------|-------------|-------------|
| | 22 | 136 | | | 15°20'26.5" | 75°34'5.7" |
| | 23 | 137 | | | 15°20'32.6" | 75°34'4.6" |
| | 24 | 138 | | | 15°20'39.9" | 75°34'4.9" |
| | 25 | 139 | | | 15°20'44.8" | 75°33'57.3" |
| | 26 | 140 | | | 15°20'50.9" | 75°33'57.3" |
| | 27 | 141 | | | 15°20'59.2" | 75°33'56.9" |
| | 28 | 179 | 4 | Malasamudra | 15°22'3.6" | 75°34'2.6" |
| | 29 | 228 | | Malasamudra | 15°22'6.2" | 75°34'18.1" |
| | 30 | 172 | | Harthi | 15°21'11" | 75°34'22.3" |
| | 31 | 227 | | Malasamudra | 15°22'15.2" | 75°34'25.2" |
| | 32 | 239 | | Harthi | 15°20'52.8" | 75°34'41.2" |
| | 33 | 167 | 4 | Kurthkoti | 15°21'42.8" | 75°33'54.3" |

| | | | | | |
|--------------|-----|-----------|-------------|-------------|-------------|
| 34 | 176 | | Harthi | 15°21'44.5" | 75°34'9.5" |
| 35 | 178 | | Kurthkoti | 15°21'58.1" | 75°34'5.6" |
| 36 | 164 | | Kurthkoti | 15°22'2.8" | 75°33'48.1" |
| 37 | 165 | 3 | Kurthkoti | 15°21'55.3" | 75°33'50.5" |
| 38 | 166 | | Kurthkoti | 15°21'49.3" | 75°33'51.3" |
| 39 | 177 | | Malasamudra | 15°21'51.4" | 75°34'8.1" |
| Total | | 39 | | | |

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) |
|---|---|---|
| Government of India (Host) | Generacion Eolica India Limited | 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 11, EB 52)

ACM0002 draws upon the following tools which have been used for ex-ante Emission Reduction calculation:

- Tool to calculate the emission factor for an electricity system - Version 02, EB 50
- Tool for the demonstration and assessment of additionality - Version 05.2, EB 39

A.5. Crediting period of project activity

>> The length of the Crediting period of the project activity as per registered PDD is 10 years (Fixed). The crediting period start date is 01/04/2011 and length of crediting period is 10 years (from 01/04/2011 to 31/03/2021).

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

>> The start date of the project activity is 24/08/2006, which is the date of placement of purchase order for the WECs. The first WTG under this project activity was commissioned on 17/12/2007 and the last WTG was commissioned on 10/10/2008. All 39 WTGs are Enercon make (E-53), having a capacity of 800 kW each. There is no such event occurred during the monitoring period, which may impact the applicability of the methodology.

The commissioning date for all the WECs included in the project activity is given in the table below.

Table-2:

| Sl. No. | Commissioning Date | No. of WTGs | Location No. of WTGs |
|---------|--------------------|-------------|----------------------|
| 1 | 17/12/2007 | 4 | 170a |
| 2 | | | 170 |
| 3 | | | 171 |
| 4 | | | 236 |
| 5 | 17/03/2008 | 6 | 229 |
| 6 | | | 181 |
| 7 | | | 180 |
| 8 | | | 163 |
| 9 | | | 226 |
| 10 | | | 230 |
| 11 | 25/06/2008 | 8 | 173 |
| 12 | | | 231 |
| 13 | | | 174 |
| 14 | | | 233 |

| | | | |
|----|------------|----|------|
| 15 | | | 232 |
| 16 | | | 234 |
| 17 | | | 169A |
| 18 | | | 237 |
| 19 | 07/07/2008 | 10 | 168 |
| 20 | | | 169 |
| 21 | | | 235 |
| 22 | | | 136 |
| 23 | | | 137 |
| 24 | | | 138 |
| 25 | | | 139 |
| 26 | | | 140 |
| 27 | | | 141 |
| 28 | | | 179 |
| 29 | 11/09/2008 | 4 | 228 |
| 30 | | | 172 |
| 31 | | | 227 |
| 32 | | | 239 |
| 33 | 29/09/2008 | 4 | 167 |
| 34 | | | 176 |
| 35 | | | 178 |
| 36 | | | 164 |
| 37 | 10/10/2008 | 3 | 165 |
| 38 | | | 166 |
| 39 | | | 177 |

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

>> Not applicable.

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

>> Approved monitoring methodology, ACM0002 Version 11, Sectoral Scope: 1, “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, by CDM – Meth Panel is proposed to be used to monitor the emission reductions.

This approved monitoring methodology requires monitoring of the following:

- Electricity generation from the project activity; and
- Operating margin emission factor and build margin emission factor of the grid, where ex-post determination of grid emission factor has been chosen

Since the baseline methodology is based on ex-ante determination of the baseline, the monitoring of operating margin emission factor and build margin emission factor is not required.

There is one main and check meter dedicated to the machines of the project activity at 33 kV metering point (billing point) as shown in the line diagram below. The 33 kV metering points are further connected to step up transformers and subsequently to the bulk meters (there are three sets of main and check meters as bulk meter) at 220 kV metering point for the machines of the project activity.

In order to determine the net electricity supplied to the grid by the project, the State utility applies the transmission loss to the meter reading recorded at 33 kV metering point. The reading at 33 kV metering point will be taken by the representatives of Enercon and the State utility. This reading is recorded in the form of JMR (Form B) and is signed by the representatives of Enercon and State Utility. Both electricity export and import are metered at this metering point.

The electricity supplied to the grid is apportioned based on transmission Loss. The Joint meter reading contains the following data:-

1. Electricity Export
2. Electricity Import
3. Transmission Loss (Between the 33 kV metering point and 220 kV pooling substation)

4. Net Electricity supplied to the Grid [Electricity Export-115% of Electricity Import-Transmission Loss]

$$\begin{aligned} \text{EGy} &= \text{Gp} - \text{Li} \\ &= (\text{Gpe} - 115\% * \text{Gpi}) - \text{Li} \end{aligned}$$

Where,

EGy : Net Electricity supplied to grid by the project activity

$$\text{Gp} = (\text{Gpe} - 115\% * \text{Gpi})$$

Where,

Gpe : Electricity Export recorded at the meter(s) connected 39 machines of the project activity

Gpi : Electricity Import recorded at the meter(s) connected 39 machines of the project activity.

Li : Transmission loss

Transmission loss is certified by the state utility in the JMR (Form B). The procedure for calculation of transmission loss by the State utility is as follows:

$$L = \sum jGj - N$$

Where,

$\sum jGj$ = Summation of electricity generation data measured at all the feeders connected to pooling substation

N = Electricity generation data measured at substation from the feeders emanating from the pooling substation

L = Total transmission loss

$$\text{Li} : \text{Gp} * (\text{L} / \sum Gj)$$

Where,

Gp = Generation of electricity by the project activity recorded at the feeder connected to 39 turbines of the project activity [Export (Gpe) - 115% * Import (Gpi)]

Transmission Loss is directly applied from the Joint Meter Report (Form B) for the project activity and the JMR (Form B) is signed jointly by the representatives of the Company (Enercon) and the state utility.

Therefore, Energy Supplied to the Grid after adjustment of transmission loss is as follows:

$$\text{EGy} = \text{EG export} - 115\% * \text{EG import} - \text{Transmission Loss}$$

The meter readings (both export and import), transmission loss and net electricity supplied to the grid are recorded in the JMR (Form B). Hence, all these values are sourced from the JMR for the calculation emission reduction. Please refer to section D.2 for details on calibration and QA/QC procedures.

The net electricity supplied to the grid can be cross checked from the invoices raised on the state utility for supply of net electricity supplied to the grid.

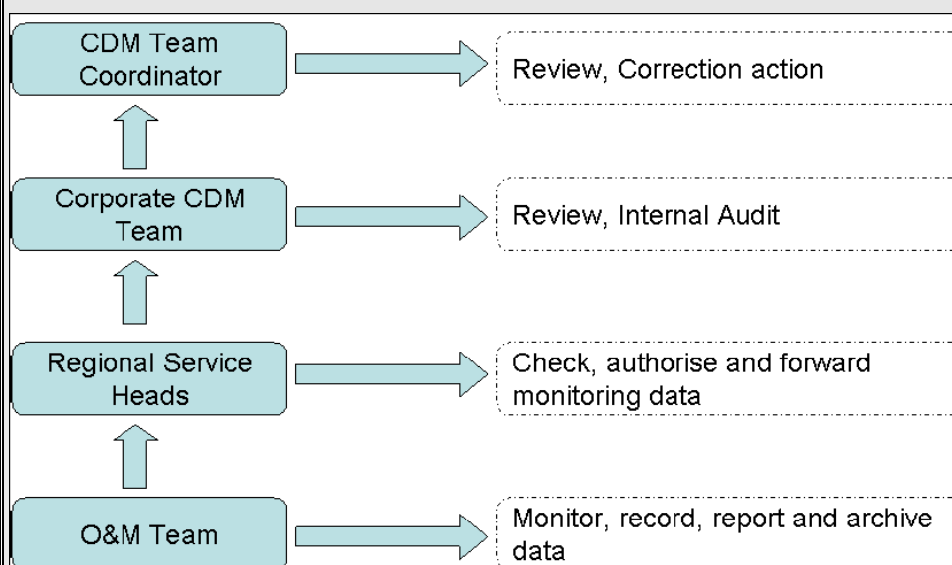
The Project is operated and managed by GEI. The operational and maintenance contract for the project is with Enercon. Enercon is an ISO 9001:2000 certified Quality Management system from Germanischer Lloyd. Enercon (India) Limited follows the documentation practices to ensure the reliability and availability 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. All the meters will be tested for accuracy once every year. The project will adhere to all the mandatory regulatory and statutory requirements at the state as well as national level. Enercon is Operation and Maintenance contractor for the project activity and provides the daily generation report to the project proponent.

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 staffs that are positioned to take care all the activities starting from project construction to operation and maintenance, Enercon Training Academy provides need based periodical training to meet the requirements of the project. The training is contemporary, which results in imparting focused knowledge leading to value addition to the attitude and skills of all the trainees. The training facility is located at Daman and is fully functional and equipped with qualified trainers, training equipments, classrooms and hostel facilities.

The operational and management structure implemented is as follows:



Metering details & QA/ QC procedures

Metering Equipments: Metering system for the project activity consists of one main and one check meter at 33 kV metering point & three sets of main & check meters (bulk meters) at 220 kV sub-station end. Both the meters are two-way tri-vector meters of accuracy class 0.2s capable of recording import and export of electricity. The metering equipment is calibrated annually.

Meter Readings: The Net electricity supplied to the grid is recorded in the form of Joint Meter Reading (JMR) (Form B) in the presence of State Utility and the representative of the Project proponent (Enercon). The Joint meter reading contains the value of energy imported and exported and the net supply to the grid during the recording period. This JMR is certified by the Authorized representative of the state utility and representative of the Company (Enercon). These certified readings are then used to prepare the invoices to be raised on State Utility. Therefore, the net electricity supplied to the grid as mentioned in the JMR can be cross-checked with the invoices.

Inspection of Energy Meters: All main and check energy meters (export and import) are of 0.2s 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: All the main & check meters will be tested for accuracy with a standard meter

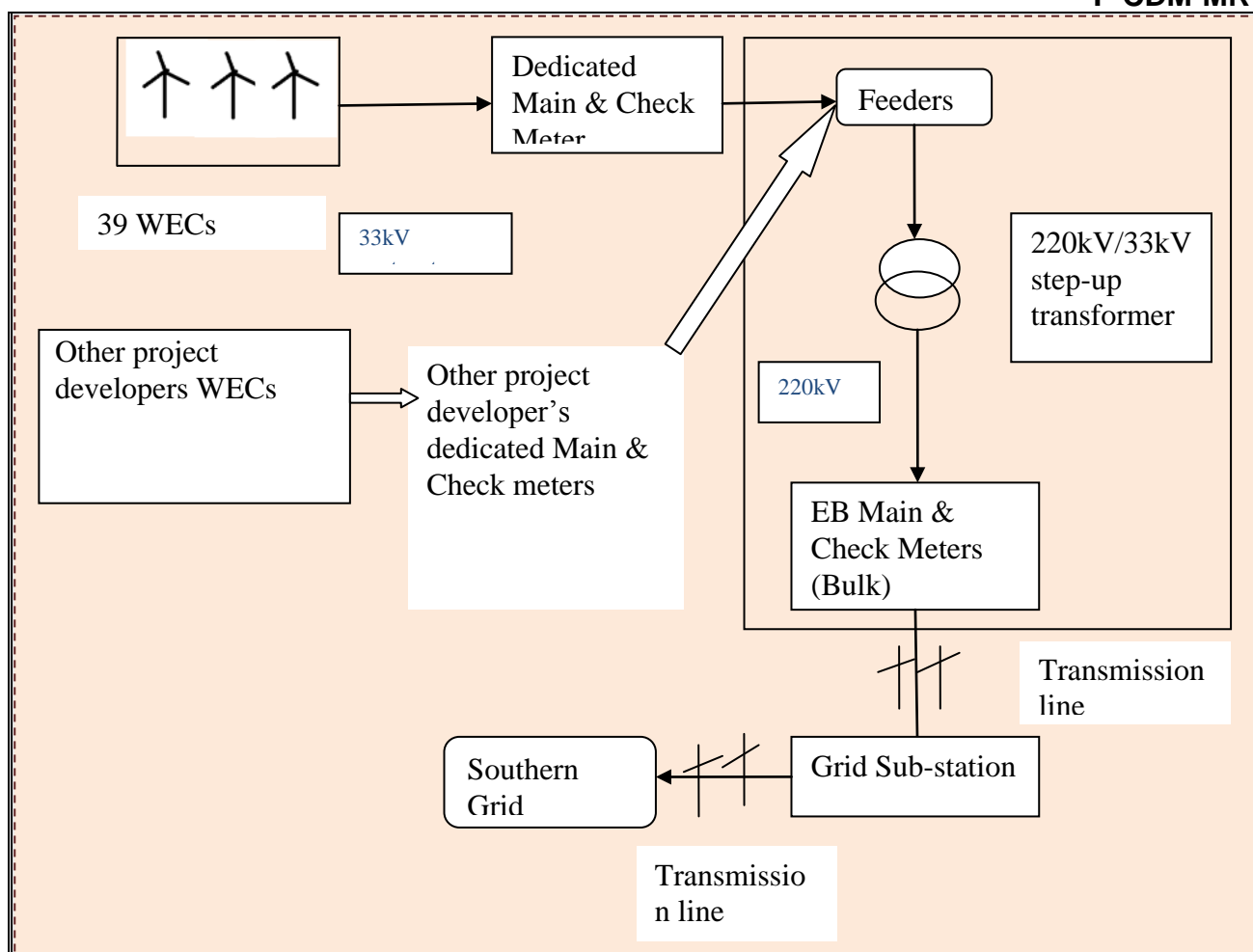
by the KPTCL's testing Division. The KPTCL will carry out the calibration, periodical testing, sealing and maintenance of meters. The KPTCL will provide a copy of the test reports.

If during the meter test checking,

- the main meter is found to be within the permissible limit of error and the corresponding check meter is beyond the permissible limits, then the meter reading will be as per the main meter as usual. The check meter shall, however, be calibrated immediately.
- the main meter is found to be beyond permissible limits of error, but the corresponding check meter is found to be within permissible limit of error, then the meter reading for the month up to the date and time of such test shall be as per the check meter. The main meter shall be calibrated immediately and meter reading for the period thereafter till the next monthly meter reading shall be as per the calibrated main meter.
- both the main meters and the corresponding check meters are found to be beyond the permissible limits of error, both the meters shall be immediately calibrated and the correction will be applied to the reading registered by the main meter to arrive the correct reading of energy supplied to the grid for the period up to the last test.

In case of the failures such as burning of the meter and the erratic display of the metered parameters and when the error found in testing the meters is beyond the permissible limit of error, the meter shall be calibrated immediately and the correction will be applied to the reading registered by the main meter to arrive the correct reading of energy supplied to the grid for the period up to last test.

The line diagram of the metering system for the project activity is as follows:



The calibration details for the meters (both main & check meter) at 33 kV metering point have been shown below:

| Meter Type | Meter Sr. no. | Accuracy class, Make | Past Calibration date | Latest Calibration date | Calibration Result | Calibration due on |
|-------------|---------------|----------------------|-----------------------|-------------------------|--------------------|--------------------|
| Main Meter | 05389382 | 0.2s, L&T | 28/04/2011 | 12/01/2012 | OK | 11/01/2013 |
| Check Meter | 07022924 | 0.2s, L&T | 28/04/2011 | 12/01/2012 | OK | 11/01/2013 |

The calibration details for the bulk meters (both main & check meters) at 220 kV sub-station have been shown below:

| Meter Type | Meter Sr. no. | Accuracy class, Make | Past Calibration done | Latest Calibration done | Calibration Result | Calibration due on |
|------------|---------------|----------------------|-----------------------|-------------------------|-------------------------|--------------------|
| Main Meter | 07022944 | 0.2s, L&T | 22/06/2011 | 25/09/2012 | OK (delay was observed) | 24/09/2013 |

| | | | | | | |
|-------------|----------|-----------|------------|------------|-------------------------|------------|
| Check Meter | 07022903 | 0.2s, L&T | 22/06/2011 | 25/09/2012 | OK (delay was observed) | 24/09/2013 |
| Main Meter | 07022908 | 0.2s, L&T | 22/06/2011 | 25/09/2012 | OK (delay was observed) | 24/09/2013 |
| Check Meter | 07022915 | 0.2s, L&T | 22/06/2011 | 25/09/2012 | OK (delay was observed) | 24/09/2013 |
| Main Meter | 06760786 | 0.2s, L&T | 22/06/2011 | 25/09/2012 | OK (delay was observed) | 24/09/2013 |
| Check Meter | 06767587 | 0.2s, L&T | 22/06/2011 | 25/09/2012 | OK (delay was observed) | 24/09/2013 |

From the above table, it can be seen that calibration of the meters at 33 kV meter point has been done on annual basis for customer and the calibration results show the error within the permissible limits.

Meters Calibration at substation has been delayed so a conservative error factor is applied to Transmission losses from months of June to Sep-2012.

Operational detail of project;

| Wec No. | KARNATAKA | | Lack Of Wind | Monthly Performance Report | | | | | Date:01/10/2011-31/12/2012 | | |
|-------------------------------|------------|------------|-----------------------------------|----------------------------|------------|------------|------------|-------------------------|----------------------------|----------------------|-------|
| | Generation | | | Down Time | | | | Machine Availability(%) | Capacity Factor(%) | Grid Availability(%) | |
| | KWh | Hrs | | Machine | | Grid | | | | | |
| | | | | Fault | Shutdown | Fault | Shutdown | | | | Total |
| Site: GADAG PLANES, KARNATAKA | | | GENERACION EOLICA INDIA PVT. LTD. | | | | | | Total WEC : 39 | | |
| GEIPLGP-01 (170) | 1847883 | 9806:00:00 | 913:38:00 | 51:03:00 | 52:12:00 | 136:15:00 | 36:49:00 | 1186:00:00 | 99.06 | 21.01 | 98.43 |
| GEIPLGP-02 (170A) | 1680725 | 9597:00:00 | 931:00:00 | 254:36:00 | 47:25:00 | 136:15:00 | 36:49:00 | 1395:00:00 | 97.25 | 19.11 | 98.43 |
| GEIPLGP-03 (171) | 1824816 | 9795:00:00 | 928:00:00 | 38:04:00 | 55:59:00 | 139:31:00 | 37:02:00 | 1197:00:00 | 99.14 | 20.75 | 98.39 |
| GEIPLGP-04 (236) | 1923488 | 9765:00:00 | 876:36:00 | 55:49:00 | 150:54:00 | 117:38:00 | 25:58:00 | 1227:00:00 | 98.12 | 21.87 | 98.69 |
| GEIPLGP-05 (163) | 1669240 | 9794:00:00 | 947:38:00 | 56:50:00 | 47:48:00 | 136:16:00 | 35:40:00 | 1219:00:00 | 99.05 | 18.98 | 98.44 |
| GEIPLGP-06 (180) | 1851119 | 9829:00:00 | 941:37:00 | 15:43 | 52:34:00 | 136:16:00 | 38:53:00 | 1184:00:00 | 99.38 | 21.05 | 98.41 |
| GEIPLGP-07 (181) | 1796110 | 9714:00:00 | 992:35:00 | 61:10:00 | 57:38:00 | 133:17:00 | 36:43:00 | 1276:00:00 | 98.92 | 20.47 | 98.45 |
| GEIPLGP-08 (226) | 1882970 | 9779:00:00 | 945:43:00 | 84:15:00 | 55:45:00 | 123:38:00 | 25:56:00 | 1234:00:00 | 98.73 | 21.41 | 98.64 |
| GEIPLGP-09 (229) | 1835561 | 9655:00:00 | 957:12:00 | 35:29:00 | 199:37:00 | 121:18:00 | 25:16:00 | 1338:00:00 | 97.86 | 20.87 | 98.67 |
| GEIPLGP-10 (230) | 1810202 | 9846:00:00 | 911:01:00 | 31:45:00 | 55:28:00 | 127:19:00 | 25:17:00 | 1147:00:00 | 99.21 | 20.59 | 98.61 |
| GEIPLGP-11 (173) | 1879650 | 9770:00:00 | 949:14:00 | 69:28:00 | 40:13:00 | 136:15:00 | 37:06:00 | 1222:00:00 | 99 | 21.38 | 98.42 |
| GEIPLGP-12 (231) | 1883519 | 9794:00:00 | 894:01:00 | 93:40:00 | 62:55:00 | 125:44:00 | 25:53:00 | 1198:00:00 | 98.58 | 21.42 | 98.62 |
| GEIPLGP-13 (232) | 1901332 | 9925:00:00 | 849:42:00 | 24:45:00 | 45:24:00 | 123:38:00 | 25:55:00 | 1067:00:00 | 99.36 | 21.62 | 98.64 |
| GEIPLGP-14 (233) | 1978218 | 9887:00:00 | 866:05:00 | 38:43:00 | 55:17:00 | 123:38:00 | 26:12:00 | 1105:00:00 | 99.14 | 22.5 | 98.64 |
| GEIPLGP-15 (235) | 2055425 | 9948:00:00 | 858:11:00 | 7:03 | 31:49:00 | 123:38:00 | 25:59:00 | 1044:00:00 | 99.65 | 23.37 | 98.64 |
| GEIPLGP-16 (234) | 2018846 | 9905:00:00 | 868:48:00 | 24:58:00 | 43:38:00 | 123:38:00 | 29:22:00 | 1087:00:00 | 99.38 | 22.96 | 98.61 |
| GEIPLGP-17 (237) | 1830226 | 9840:00:00 | 879:31:00 | 74:04:00 | 49:26:00 | 123:38:00 | 25:59:00 | 1152:00:00 | 98.88 | 20.81 | 98.64 |
| GEIPLGP-18 (174) | 1871651 | 9705:00:00 | 931:30:00 | 120:51:00 | 64:17:00 | 137:43:00 | 37:46:00 | 1288:00:00 | 98.32 | 21.28 | 98.4 |
| GEIPLGP-19 (136) | 1862474 | 9938:00:00 | 805:03:00 | 38:48:00 | 47:27:00 | 131:58:00 | 33:48:00 | 1055:00:00 | 99.22 | 21.18 | 98.49 |
| GEIPLGP-20 (137) | 1791782 | 9848:00:00 | 870:28:00 | 54:15:00 | 54:32:00 | 131:58:00 | 34:43:00 | 1144:00:00 | 99.01 | 20.38 | 98.48 |
| GEIPLGP-21 (138) | 1748869 | 9791:00:00 | 926:23:00 | 58:48:00 | 42:14:00 | 134:10:00 | 32:39:00 | 1201:00:00 | 99.08 | 19.89 | 98.48 |
| GEIPLGP-22 (139) | 1781783 | 9816:00:00 | 915:15:00 | 47:16:00 | 49:24:00 | 131:58:00 | 33:39:00 | 1176:00:00 | 99.12 | 20.26 | 98.49 |
| GEIPLGP-23 (140) | 1832786 | 9823:00:00 | 916:33:00 | 28:15:00 | 59:41:00 | 136:26:00 | 33:39:00 | 1170:00:00 | 99.2 | 20.84 | 98.45 |
| GEIPLGP-24 (141) | 1774522 | 9860:00:00 | 912:38:00 | 7:01 | 41:11:00 | 136:32:00 | 34:57:00 | 1132:00:00 | 99.56 | 20.18 | 98.44 |
| GEIPLGP-25 (168) | 1790505 | 9849:00:00 | 847:07:00 | 73:12:00 | 53:23:00 | 137:33:00 | 33:46:00 | 1144:00:00 | 98.85 | 20.36 | 98.44 |
| GEIPLGP-26 (169) | 1870599 | 9856:00:00 | 885:16:00 | 40:06:00 | 45:28:00 | 134:04:00 | 34:39:00 | 1136:00:00 | 99.22 | 21.27 | 98.47 |
| GEIPLGP-27 (179) | 1851280 | 9888:00:00 | 896:49:00 | 18:20 | 37:10:00 | 136:16:00 | 38:54:00 | 1126:00:00 | 99.5 | 21.05 | 98.41 |
| GEIPLGP-28 (169A) | 1842060 | 9875:00:00 | 893:59:00 | 11:37 | 48:35:00 | 131:12:00 | 33:39:00 | 1118:00:00 | 99.45 | 20.95 | 98.5 |
| GEIPLGP-29 (239) | 1850069 | 9900:00:00 | 858:16:00 | 41:57:00 | 42:21:00 | 124:24:00 | 25:54:00 | 1093:00:00 | 99.23 | 21.04 | 98.63 |
| GEIPLGP-30 (172) | 1854996 | 9806:00:00 | 966:10:00 | 7:22 | 34:50:00 | 136:15:00 | 34:03:00 | 1186:00:00 | 99.62 | 21.09 | 98.45 |
| GEIPLGP-31 (227) | 1827986 | 9916:00:00 | 886:05:00 | 19:21 | 39:22:00 | 123:38:00 | 25:57:00 | 1086:00:00 | 99.47 | 20.79 | 98.64 |
| GEIPLGP-32 (228) | 1823809 | 9803:00:00 | 964:56:00 | 51:44:00 | 33:08:00 | 123:38:00 | 28:00:00 | 1202:00:00 | 99.23 | 20.74 | 98.62 |
| GEIPLGP-33 (164) | 1810824 | 9810:00:00 | 945:45:00 | 47:22:00 | 39:42:00 | 136:16:00 | 35:39:00 | 1203:00:00 | 99.21 | 20.59 | 98.44 |
| GEIPLGP-34 (167) | 1855993 | 9872:00:00 | 896:03:00 | 29:39:00 | 45:06:00 | 136:16:00 | 35:40:00 | 1141:00:00 | 99.32 | 21.11 | 98.44 |
| GEIPLGP-35 (176) | 1839496 | 9853:00:00 | 861:25:00 | 69:16:00 | 37:28:00 | 137:48:00 | 41:00:00 | 1139:00:00 | 99.03 | 20.92 | 98.37 |
| GEIPLGP-36 (178) | 1817712 | 9811:00:00 | 918:47:00 | 74:23:00 | 34:20:00 | 136:16:00 | 39:33:00 | 1201:00:00 | 99.01 | 20.67 | 98.4 |
| GEIPLGP-37 (177) | 1876823 | 9882:00:00 | 881:23:00 | 46:09:00 | 33:32:00 | 136:16:00 | 38:54:00 | 1131:00:00 | 99.28 | 21.34 | 98.41 |
| GEIPLGP-38 (165) | 1840608 | 9833:00:00 | 909:51:00 | 40:00:00 | 57:50:00 | 136:16:00 | 36:25:00 | 1177:00:00 | 99.11 | 20.93 | 98.43 |
| GEIPLGP-39 (166) | 1798715 | 9901:00:00 | 898:02:00 | 9:05 | 38:41:00 | 134:10:00 | 37:47:00 | 1113:00:00 | 99.57 | 20.45 | 98.44 |
| Total | 71884672 | 383285:00 | 35298:16 | 1952:12:00 | 2083:44:00 | 5128:55:00 | 1281:50:00 | 45640:00 | 99.06 | 20.96 | 98.5 |

Capacity factor % (PLF%) achieved at machines is 20.96%.

SECTION D. Data and parameters

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

(Copy this table for each piece of data and parameter.)

| | |
|-------------------|---|
| Data / Parameter: | $EF_{grid,OM,y}$ |
| Unit: | tCO ₂ e/MWh |
| Description: | Operating Margin Emission Factor of Southern Regional Electricity Grid |
| Source of data: | “CO ₂ Baseline Database for Indian Power Sector” Version 04, published by the Central Electricity Authority, Ministry of Power, Government of India. The “CO ₂ Baseline Database for Indian Power Sector” is available at www.cea.nic.in |
| Value(s) applied: | 0.998157 |
| Purpose of data: | To calculate Baseline Emissions Factor |

| | |
|---------------------|---|
| Additional comment: | The value is calculated on ex-ante basis and it will remain same throughout the crediting period. |
|---------------------|---|

| | |
|--------------------------|---|
| Data / Parameter: | $EF_{grid,BM,y}$ |
| Unit: | tCO ₂ e/MWh |
| Description: | Build Margin Emission Factor of Southern Regional Electricity Grid |
| Source of data: | “CO ₂ Baseline Database for Indian Power Sector” Version 04, published by the Central Electricity Authority, Ministry of Power, Government of India. The “CO ₂ Baseline Database for Indian Power Sector” is available at www.cea.nic.in |
| Value(s) applied: | 0.71332 |
| Purpose of data: | To calculate Baseline Emissions Factor |
| Additional comment: | The value is calculated on ex-ante basis and it will remain same throughout the crediting period. |

| | |
|--------------------------|---|
| Data / Parameter: | $EF_{grid,CM,y}$ |
| Unit: | tCO ₂ e/MWh |
| Description: | Combined Margin Emission Factor of Southern Regional Electricity Grid |
| Source of data: | “CO ₂ Baseline Database for Indian Power Sector” Version 04, published by the Central Electricity Authority, Ministry of Power, Government of India. The “CO ₂ Baseline Database for Indian Power Sector” is available at www.cea.nic.in Calculated |
| Value(s) applied: | 0.92694 |
| Purpose of data: | To calculate Baseline Emissions |
| Additional comment: | The value is calculated on ex-ante basis and it will remain same throughout the crediting period. |

D.2. Data and parameters monitored

(Copy this table for each piece of data and parameter.)

| | |
|---------------------------------------|--|
| Data / Parameter: | EGy |
| Unit: | MWh (Mega-watt hour) |
| Description: | Net electricity supplied to the grid by the Project |
| Measured/ Calculated / Default: | Calculated |
| Source of data: | Electricity supplied to the grid as per Joint Meter Reading (Form B) taken at 33 kV metering point. This value can be cross-checked by the tariff invoices raised on KPTCL/HESCOM. |

| | |
|--|---|
| Value(s) of monitored parameter: | 70119.406 |
| Monitoring equipment: | Refer section C for an illustration of the provisions for measurement methods. |
| Measuring/ Reading/ Recording frequency: | Monitored on continuous basis Frequency of recording data: Monthly Recording: The values of electricity supplied to the grid are sourced from JMR for the sub projects at 33 kV metering point. |
| Calculation method (if applicable): | $EGy = Gpe - 115\% * Gpi - Li$ |
| QA/QC procedures: | Refer section C for an illustration of the provisions for QA/QC procedures. |
| Purpose of data: | To calculate emission reduction. |
| Additional comment: | The data will be archived for crediting period + 2 years. |

| Data/Parameter | Gpe |
|--|---|
| Unit | MWh (Mega-Watt hour) |
| Description | Electricity Export recorded at the meter(s) connected 39 machines of the project activity. |
| Measured/Calculated /Default | Measured |
| Source of data | Electricity export to the grid as per Joint Meter Reading (Form B) taken at 33 kV metering point. This value can be cross-checked by the tariff invoices raised on HESCOM. |
| Value(s) of monitored parameter | 70664.100 |
| Monitoring equipment | L&T Make; accuracy class: 0.2 The meters are calibrated once in a year. Last calibration done: 12/01/2012 ; valid till 11/01/2013 Serial numbers of the meters: Main Meter: 05389382 Check Meter: 07022924 |
| Measuring/Reading/ Recording frequency | Monitored on continuous basis Frequency of recording data: Monthly Recording: The values of electricity exports to the grid are sourced from JMR for the sub projects at 33 kV metering point. |
| Calculation method (if applicable) | NA |
| QA/QC procedures | QA/QC procedures are implemented by state utility pursuant to the provisions of the power purchase agreement. Refer section C of QA/QC procedures. |
| Purpose of data | To calculate emission reduction. |
| Additional comment | The data will be archived for crediting period + 2 years. |

| Data/Parameter | Gpi |
|--|---|
| Unit | MWh (Mega-Watt hour) |
| Description | Electricity Import recorded at the meter(s) connected 39 machines of the project activity. |
| Measured/Calculated /Default | Measured |
| Source of data | Electricity import from the grid as per Joint Meter Reading (Form B) taken at 33 kV metering point. This value can be cross-checked by the tariff invoices raised on HESCOM. |
| Value(s) of monitored parameter | 42.9 |
| Monitoring equipment | L&T Make; accuracy class: 0.2 The meters are calibrated once in a year. Last calibration done: 12/01/2012 ; valid till 11/01/2013 Serial numbers of the meters: Main Meter: 05389382 Check Meter: 07022924 |
| Measuring/Reading/ Recording frequency | Monitored on continuous basis Frequency of recording data: Monthly Recording: The values of electricity exports to the grid are sourced from JMR for the sub projects at 33 kV metering point. |
| Calculation method (if applicable) | NA |
| QA/QC procedures | QA/QC procedures are implemented by state utility pursuant to the provisions of the power purchase agreement. Refer section C of QA/QC procedures. |
| Purpose of data | To calculate emission reduction. |
| Additional comment | The data will be archived for crediting period + 2 years. |

| Data/Parameter | Li |
|--|--|
| Unit | MWh (Mega-Watt hour) |
| Description | Transmission loss between the metering point for the project activity feeding the pooling substation of Enercon and the metering point at EB Substation. |
| Measured/Calculated /Default | Calculated as per the formula described in section C. |
| Source of data | Transmission Loss will be directly applied from the Form B for the project activity. |
| Value(s) of monitored parameter | 495.358 |
| Monitoring equipment | Refer section C for an illustration of the provisions for measurement methods. |
| Measuring/Reading/ Recording frequency | Frequency of recording data: Monthly Recording: The value of transmission loss is sourced from JMR |

| | |
|------------------------------------|---|
| Calculation method (if applicable) | EB Substation is connected to the machines of the project activity and the machines commissioned by the other project developers. The project proponent does not have control over the data of the other project developers. Therefore, the project developer has to rely upon the transmission loss applied to the project activity by the state utility as reflected in the JMR (Form B). The JMR is signed by the representatives of Enercon and the state utility. |
| QA/QC procedures | QA/QC procedures are implemented by state utility pursuant to the provisions of the power purchase agreement. Refer section C of QA/QC procedures. |
| Purpose of data | To calculate emission reduction. |
| Additional comment | The data will be archived for crediting period + 2 years. |

D.3. Implementation of sampling plan

>> No sampling plan is followed by PP.

SECTION E. Calculation of emission reductions or GHG removals by sinks**E.1. Calculation of baseline emissions or baseline net GHG removals by sinks**

>> As described in the registered PDD, the baseline emission $BE_y = EG_y * EF_y$

Where,

BE_y = Baseline emissions in year y, tCO₂e

EG_y = 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 invoice..

EF_y = CO₂ emission factor of the grid (0.92694 tCO₂e/ MWh; fixed ex-ante).

Therefore, Baseline Emission for the monitoring period 01/10/2011 to 31/12/2012 is

$$\begin{aligned}
 BE_y &= EG_y * EF_y \\
 &= 70119.406 \text{ (MWh)} * 0.92694 \text{ (tCO}_2\text{/MWh)} \\
 &= 64989 \text{ tCO}_2
 \end{aligned}$$

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

>> 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 | 64989 | 0 | 0 | 64989 |

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 CO ₂ e) | 80426 | 64989 |

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

>> The Emission Reduction (ER) value in the monitoring period is 19.19 % lower as compared to the value estimated in the registered PDD, which is due to low PLF observed during monitoring period.

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

| Item | Actual values achieved up to 31 December 2012 | Actual values achieved from 1 January 2013 onwards |
|--|---|--|
| Emission reductions or GHG removals by sinks (t CO ₂ e) | 64989 (From 01/10/2011 to 31/12/2012) | Not Applicable |

- - - - -

Document information

| Version | Date | Description |
|---------|-----------------|--|
| 03.1 | 2 January 2013 | Editorial revision to correct table in section E.5. |
| 03.0 | 3 December 2012 | Revision required to introduce a provision on reporting actual emission reductions or net anthropogenic GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB70, Annex 11). |
| 02.0 | 13 March 2012 | Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20). |
| 01 | 28 May 2010 | EB 54, Annex 34. Initial adoption. |

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