

TÜV NORD CERT GmbH • P.O. Box 10 32 61 • 45032 Essen • Germany

TÜV NORD CERT GmbH

Langemarckstrasse 20
45141 Essen
Germany

Phone: +49 201 825-0
Fax: +49 201 825-2517

Info.tncert@tuev-nord.de
www.tuev-nord-cert.com

TÜV®

CDM Executive Board

Our / Your Reference

Contact
Rainer Winter
E-Mail: rwinter@tuev-nord.de

Direct Dial
Phone: -3329
Fax: -2139

Date
24.02.2011

Request for Revision of Monitoring Plan
“Enercon Wind Farm (Hindustan) Ltd in Karnataka”

CDM Registration No: 1259

Dear Sir/Madam,

Please find below the validation opinion of TÜV NORD JI/CDM Certification Program to the revision of the monitoring plan for the above mentioned project no. 1259.

If you have any questions do not hesitate to contact us.

Yours sincerely,

TÜV NORD JI/CDM Certification Program



Rainer Winter

Validation opinion as per requirement of EB49, Annex 28, para 7

Level of accuracy or completeness

☒ TÜV NORD herewith confirms that the proposed revision of the monitoring plan ensures that the level of accuracy or completeness in the monitoring and verification process is not reduced.

Additional comment:

“Enercon Wind Farm (Hindustan) Ltd in Karnataka”

(hereafter referred to as project activity) was registered on 27 October 2008 using “Consolidated methodology for grid-connected electricity generation from renewable sources” (ACM0002, Version 06).

The project activity involves the installation and generation of power from 86 WEGs in Chikkabyaladakere, Kanubehalli, Elladakere and Arasinagundi villages in Chitradurga District and Dasudi, Nelenuru, Ganadu, Annenhalli, Siddapura villages in Tumkur district of Karnataka state, India. The total installed capacity of this wind power project is 68.8 MW and the expected Emission Reductions are 148,858 tCO₂e/annum. The generated electricity is evacuated to KPTCL/DISCOM of Southern Regional Grid. The monitoring of all Wind Turbine Generators (WEGs) is done at the project site and substation which is maintained and operated by M/s Enercon India Ltd (hereafter referred to as O & M contractor).

In line with the paragraph 57 of the modalities and procedures for the CDM the DOE instructed the project participant to revise the monitoring plan to improve accuracy and completeness of information and also the requirements mentioned under paragraph 17 and 18 of Clean Development Mechanism Validation and Verification Manual (VVM) (EB-55, Annex-1). The DOE has validated the detailed procedure to arrive on the monitoring parameters in section B.7.1, B.7.2 and Annex-4 of the revised monitoring plan in track change and clean mode.

Need for revision of monitoring plan

Revision 1:

In the registered PDD under metering equipment it is mentioned that the “the metering system for the project activity consists of one main meter and one check meter”. But as per the information gathered during the site visit there are two separate feeder line exclusively for the project activity, each feeder has separate main and check meter. In addition to that the information on bulk meter installation and procedure for calculation of transmission losses have not mentioned in the PDD, but the same has been reflected in the signed PPA.

Revision 2:

The PP is requested to explain the procedure for calculation of net electricity generation w.r.t registered PDD.

Revision 3:

The calibration frequency is not mentioned in the registered PDD.

All the above revisions have been addressed in B.7.1, B.7.2 and Annex 4 of the revised MP

The DOE also confirms that the below mentioned monitoring plan is adequate and meets the

requirements stipulated under monitoring methodology (ACM0002 Version 06).

Parameter	Description	Source and cross check documents	DOE Assessment
EGy	<p>The total capacity of the project activity is 68.8 MW which delivers power to southern regional grid. To deliver the generated power of 86 WEGs belong to this project activity to the grid, the project activity has two dedicated feeder line which is connected to sub-station bulk meter. The power delivered by 56.8 MW will be supplied through feeder-I and remaining 12 MW power will be supplied through feeder-II. Each feeder line will have a separate main and check meter for monthly joint meter recording purpose. The bulk meter installed at the sub-station which is owned by Enercon India Ltd (Enercon) will again have a separate main and check meter used for measuring total electricity supplied by the whole wind farm which includes energy supplied by non-project participants for finding out transmission loss calculated based on apportioning mechanism as mentioned in PPA and followed by KPTCL/DISCOM. Electricity supplied (EGy) to the grid by the project activity is measured by the difference between export energy (EGexport), 15% transmission loss applied import energy (EGimport) and transmission loss (TE) calculated by apportioning method. All the readings related to export energy; import energy and transmission loss will be mentioned in the monthly certified joint meter readings/B-Forms. The net electricity values generated by the project activity can be cross checked with the invoice raised by the PP to KPTCL/DISCOM.</p>	<p>Monthly joint meter readings authenticated by state utility and PP representative for Energy supplied value (EGy)</p> <p>To cross check (EGy) value, the invoice raised by the project proponent to KPTCL/DISCOM for commercial purpose is verified.</p>	<p>In the revised monitoring plan, the description mentioned for calculation of net electricity supplied by the project activity is more precise in comparison with the registered PDD. The changes included are as follows,</p> <ol style="list-style-type: none"> 1. Instead of one main and one check meter system for the project activity mentioned in the registered PDD, now the revised monitoring plan includes two set of energy meters (i.e., each feeder line has one main and one check meter with a total of two feeder line exclusive for the project activity) for monthly JMR recordings. In addition information on bulk meter is also added to avoid ambiguity on transmission loss calculation. 2. In addition to above information the details of frequency of recordings, source of data, responsible

			<p>personnel and detailed description of monitoring plan are explained in detailed in the revised monitoring plan in section B.7.1, B.7.2 and Annex 4.</p> <p>All the above information's are assessed to be more appropriate and depict the actual site monitoring. Based on the information collected during the interview with the state utility personnel and Enercon and review of joint meter report, the DOE concludes that the revised monitoring plan results in increase of accuracy and completeness of monitoring.</p>
EGexport	<p>Energy exported by project activity will be monitored at 33 kV metering point. The meters installed at 33 kV metering point is capable of measuring both export and import of electricity. Two joint meter readings, one for each feeder line will provide the value of monthly export energy.</p>	<p>Monthly joint meter readings authenticated by state utility and PP representative for Energy export value (EGexport)</p>	<p>Electricity exported by the project activity is one of the monitoring parameter since this parameter is considered for calculation of net electricity supplied by the project activity. This parameter was not mentioned under monitoring of parameters in the registered PDD. Monthly exported energy will be recorded by the project site meters in the B-Form (i.e., two B-form- one for each feeder line). The above information is</p>

			assessed to be more appropriate Based on the information collected during the interview with the state utility personnel and Enercon and review of joint meter report the DOE concludes that the revised monitoring plan results in increase of accuracy and completeness of monitoring.
EGimport	Energy imported by project activity will be monitored at 33 kV metering point. The meters installed at 33 kV metering point is capable of measuring both export and import of electricity. For conservative calculation of energy imported by the project activity, the state utility will apply 15% transmission loss to the import value to the recorded import energy measured at 33 kV metering point. Two joint meter readings, one for each feeder line will provide the value of monthly import energy value.	Monthly joint meter readings authenticated by state utility and PP representative for Energy import value (EGimport)	Electricity import by the project activity is one of the monitoring parameter since this parameter is considered for calculation of net electricity supplied by the project activity. This parameter was not mentioned under monitoring of parameters in the registered PDD. Monthly imported energy will be recorded by the project site meters in the B-Form (i.e., two B-form- one for each feeder line). The above information is assessed to be more appropriate Based on the information collected during the interview with the state utility personnel and Enercon and review of joint meter report the DOE concludes that the revised monitoring plan results in increase of accuracy

			and completeness of monitoring.
T_E	Transmission loss percentage for the whole wind farm connected to 220 kV bulk meters which contains project participant WEGs and non-project participant WEGs will be calculated in general by apportioning mechanism by the state utility and applied to exported energy value measured at 33 kV metering point. Monthly joint meter reading mention the value of transmission loss which will be used to calculate net electricity supplied by the project activity to the grid.	Monthly joint meter readings authenticated by state utility and PP representative for Transmission loss value (T_E)	In the registered PDD there was no information provided on transmission loss accounted for net electricity calculation in the joint meter readings/B-form. The detailed assessment on transmission loss is mentioned below.

Assessment on calculation of transmission loss by KPTCL/BESCOM

By reviewing the JMRs, PPA and conducting interviews with PP, the DOE confirms that the transmission loss procedure mentioned in the revised monitoring plan is accurate.

Transmission loss will be calculated by the state utility and applied in monthly joint meter reading as per procedure set in the signed PPA. The calculation procedure of transmission loss is as follows,

1. Every month a joint meter reading will be prepared at 220 kV metering point for the energy export and import value for the whole wind farm. (**Y**)
2. Other than bulk meter monthly JMR, there are project site energy meters which is installed at 33 kV metering point for monthly energy generation details for the respective project proponent wind mills. A detailed monthly line loss calculation sheet will be prepared based on the energy export of all the WEGs belong to the wind farm.
3. The sum of energy exported by all the WEGs (Include project activity WEGs and non-project participant WEGs) will be calculated in line loss sheet. (**X_i**)
4. As per the procedure mentioned in the PPA, the percentage transmission loss (**Z**) will be calculated by the difference between the sum of energy exported by all the WEGs which is measured at 33 kV meting point (**X_i**) and energy exported value measured at 220 kV bulk metering point (**Y**) divided by sum of energy exported by all the WEGs (**X_i**).

$$Z = ((X_i - Y) / X_i) * 100$$

5. The percentage transmission loss will be calculated for every month and the value will be applied to energy export value measured at each 33 kV metering point for transmission loss calculation of exported energy.
6. All the transmission loss calculation procedure will be entirely under the control of state utility and the project proponents of WEGs will not have any control over the transmission loss calculation procedure and readings.

Thus the DOE concludes that the approach of calculation of transmission loss will results in conservative approach of emission reduction calculation.

Assessment on QA/QC procedures:

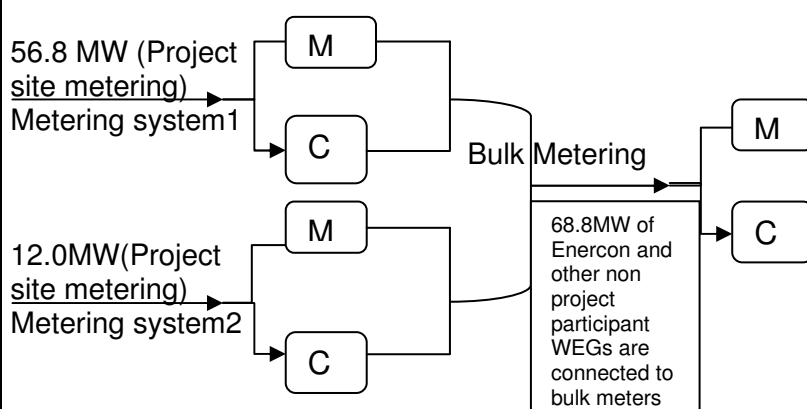
1. All the energy meters belong to the project activity will be tested for accuracy at least once in a year as per national standards (As per the CEA Notification No.: 502/70/CEA/DP & D dated

17/03/2006, calibration interval should be of at least once in 5 years.). KPTCL or BESCOM will be in charge for yearly calibration of energy meters.

2. All the energy meters will be sealed and kept it under the custody of state utility.
3. For monthly joint meter, billing and invoice purpose, the main meter readings will be considered as long as the error identified by the main meter is with in the permissible error of 0.2 accuracy class. If there is any discrepancy in accuracy of main meter identified during calibration, the energy generation by the WEGs will be monitored as per the procedure set out in PPA and Annex-4 of the revised monitoring plan.

The above adopted procedure is verified by reviewing PPA, calibration report and interview with state utility and Enercon. Thus the DOE concludes that the QA/QC approach followed by the state utility will result in reliable quality of emission achieved by the project activity.

The project metering arrangement is as follows:



The proposed revised monitoring plan (in track change mode and clean versions submitted along with) ensures that the level of accuracy and completeness in the monitoring and verification process is not reduced as a result of the revisions.

Reference documents:

1. Joint meter readings/B-Form for 56.8 MW capacity and 12 MW capacity.
2. Data and information gathered during site visit w.r.t monitoring, monthly energy generation recording, data collection, archiving and quality management etc
3. Calibration certificate and CEA Notification No.: 502/70/CEA/DP
4. Power purchase agreement
5. Loss calculation sheet provided by BESCOM

Accordance with approved monitoring methodology

- ☒ *TÜV NORD herewith confirms that the proposed revision of the monitoring plan is in accordance with the approved monitoring methodology applicable to the project activity.*

Additional comment:

The proposed revised monitoring plan correctly follows the applied methodology i.e. ACM 0002, version 6.

Previous verification findings

- ☐ *TÜV NORD herewith confirms that the findings of previous validation reports, if any, have been taken into account.*
- ☒ *No findings from previous validation had to be considered.*

Additional comment:

The DOE has identified the need of revising the monitoring plan to improve accuracy and completeness of the monitoring information (Cp para 57 of CDM M&P) during the first periodic verification and validated the revision of the monitoring plan.