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

CDM Executive Board

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

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Our / Your Reference	Contact	Direct Dial	Date
	Rainer Winter E-Mail: rwinter@tuev-nord.de	Phone: -3329 Fax: -2139	08.09.2010

Request for Revision of Monitoring Plan
"14 MW Wind Power Project in Maharashtra"

CDM Registration No: 2342

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. 2342.

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

Best regards

Rainer Winter

Validation opinion as per requirement of EB49, Annex 28, para 9
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:* "14 MW Wind Power Project in Maharashtra" (hereafter referred to as project activity) was registered on 08 June 2009 using "Grid connected renewable electricity generation" (AMS I.D, Version 13). The project activity involves the establishment of 10 wind electric generators (WEGs) of individual capacities 1.25 MW (4 WEGs) and 1.5 MW (6 WEGs) located at Dhule and Sangli districts of Maharashtra respectively. The monitoring of electricity generation of all Wind Turbine Generators (WTGs) is done at Central Monitoring Station (CMS) maintained and operated by M/s Suzlon Energy Limited (hereafter referred to as O & M contractor) and the net export of electricity by the WTG's is determined by the MSEDCL with the help of O & M contractor. The PP during the validation stage mentioned detailed procedure of the apportioning logic applied by MSEDCL and demonstrated the same to the DOE. In line with the paragraph 57 of the modalities and procedures for the CDM which allows project participants to revise monitoring plans 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 TÜV NORD is validating the appropriateness of inclusion of the additional monitoring parameters in line with the procedure of apportioning adopted by the Maharashtra State Electricity Distribution Company Limited (MSEDCL) to arrive at the monitoring parameter "Net Electricity exported to the grid by the Project Activity". Every month MESDCL is issuing JMR reports to the PP by applying apportioning logic with the help of parameters "Total electricity generation by WTGs owned by PP", "Total electricity generation by all the WTGs connected to the common bulk meters", "Total net electricity supplied to the grid (by all WTGs connected to the substation) measured at the substation by bulk meter (main and check meter)". To increase the transparency of the applied apportioning mechanism, the PP is including above mentioned parameters additional to the existing monitoring plan in the proposed revised monitoring plan and hence requesting revision in monitoring plan. Furthermore, the PP has updated/ corrected the monitoring plan under section B.7.2 and Annex-4 of the PDD and narrated the monitoring procedures with more clarity; DOE is also validating the same under the Request for Revision in the monitoring plan. TÜV NORD assessed and found that existing monitoring plan is monitoring the net electricity exported to the grid and hence monitoring only the outcome of the apportioning logic applied by the MSEDCL. The inclusion of the additional monitoring parameters will attain completeness in monitoring plan and increases the transparency as the applied apportioning logic (by MSEDCL) can be readily demonstrated. The available documents and evidences in relation to monitoring requirements of electricity generated by installed WTG's and monitoring of net electricity delivered to the grid by WTGs were assessed by TÜV NORD. The monitored data was cross verified in accordance to the procedure laid down by O & M contractor and MSEDCL. TÜV NORD verified and found that "Net Electricity exported to the grid by the Project Activity" is obtained from two measurements viz • The electricity generated by individual WTG's of all the project promoters with the help of integrated electronic meter (also referred as control panel meter). This measurement is undertaken by the O & M contractor for SPD (at the CMS). • The import, export and net electricity exported to the MSEDCL measured by the main and check meters (to apportion the net electricity export to grid for all the connected WTG's) which is recorded by representative of MSEDCL in presence of O & M contractor The TÜV NORD also noted that it is not possible to calibrate the control panel meters (also referred as integrated electronic meter). This was verified from the letter submitted by the O & M controller at the time of validation. Furthermore, the PP with the help of letter issued by O & M contractor has substantiated to TÜV NORD the same applies for all other WTG's connected to the common bulk meter.

Table-1: Nomenclature

Parameter	Description	Source
EGy	Net Electricity exported to the grid by the Project Activity,	Calculated from measured values
$\sum_{0}^{n} EG_{n,y}$	Electricity generation by WTG/s owned by SPD (either individual or group) included in this project activity at the controller.	Wind Mill's Break-up Energy Report provided by O & M contractor. This value will be taken from JMR.
EG_{MSEDCL}	Total net electricity supplied to the grid measured at the substation by common bulk meter (main and check meter).	Monthly measurements undertaken by representative of MSEDCL in presence of representative of O & M contractor. This value will be taken from JMR.
$\sum_{0}^{m} EG_{m,y}$	Total electricity generation by all the WTGs connected to the common bulk meters	Monitoring of all wind turbines is done at CMS. This value will be taken from JMR.

Verification of appropriatness of the Monitoring Parameters:

The apportioning protocol is applicable at the feeder level and can be applied to the windmills located at Dhule and Sangli sites.

- The verification team verified the apportioning logic with the help of below correlation and confirms the validity of the proposed approach and the monitoring arrangement as provided under the revised monitoring plan. Sample results as summarized under "Results of Apportioning logic Vs readings in Joint Meter Reading (JMR) Report issued by MSEDCL" shall provide further details in this regard. The verification team verified also the JMR values and found that the values obtained by applying the apportioning logic on the available monitored data and the issued JMR are in close agreement.

$$\mathbf{EGy} = \left[\frac{\sum_{0}^{n} EG_{n,y}}{\sum_{0}^{m} EG_{m,y}} \right] X \; EG_{MSEDCL}$$

Results of Apportioning logic Vs Joint Meter Reading (JMR) Report issued by MSEDCL:

Sample demonstration for the month of August 2008 for site-Village Jamade, District-Dhule:

Month	WEG Meter Readings		MSEDCL Meter Readings for Total WEGS connected to the Common bulk meter(main meter & check meter)	MSEDCL JMR Report readings	Demonstration of apportioning logic by SPD	% difference
	Electricity generated by all the WEGs of SPD with the help of inbuilt control panel meters of all the WEGs connected to common bulk meters (i.e. main meter & check meter).	Electricity generated by all the WEGs (including WEGs of SPD) with the help of inbuilt control panel meters of all the WEGs connected to common bulk meters (i.e. main meter & check meter).	Net export from all the WEGs	Net Electricity exported to the grid by the Project Activity (EG_Y)	Net Electricity exported to the grid by the Project Activity demonstrated with the help of application of Apportioning logic	
	$\sum_{0}^{n} EG_{n,y}$	$\sum_{0}^{m} EG_{m,y}$	EG_{MSEDCL}			
UNIT	(MWh)	(MWh)	(MWh)	(MWh)	(MWh)	
J-21	238.274	5302.503	5112.000	229.713	229.714	0.00%
J-22	245.524	5302.503	5112.000	236.702	236.703	0.00%
J-23	256.074	5302.503	5112.000	246.874	246.874	0.00%
Summation	739.872	5302.503	5112.000	713.289	713.291	0.00%

In light of above substantiation, the TÜV NORD concludes that the inclusion of the additional monitoring parameters will provide increased level of accuracy and completeness in the monitoring. TÜV NORD also confirms that the above mentioned monitoring plan is adequate and meets the requirements stipulated under the monitoring methodology (AMS I.D Version 13, paragraph 13).

TÜV NORD checked the updated/ corrected the monitoring plan under section B.7.2 and Annex-4 of the PDD and found the same accurate. The TÜV NORD further confirms that the proposed revision in the monitoring plan does not impact the estimation of emission reductions for the proposed activity.

TÜV NORD therefore concludes that Revision in the Monitoring plan will effect real measurable and attributable emission reductions.

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. AMS I.D, version 13, EB-36, paragraph 13.
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:* Project participant has identified the need of revising of the monitoring plan to improve accuracy and completeness of the monitoring information (Cp para 57 of CDM M&P and Procedures for Revising Monitoring Plans in Accordance with Paragraph 57 of the Modalities and Procedures for the CDM, Version-2, EB-49, Annex-28) and requested DOE to validate the revision of the monitoring plan. TÜV NORD confirms that the same have been taken into account for the proposed revision of monitoring plan. **List Supportive Documents:** • *Calibration certificate for main meter and check meter for Jamade feeder number-14 issued by MSETCL, EHV Testing Division Dhule on date 2009-07-08 for Main meter: 4738075 and Check meter: 4738076* • *Letter issued by M/s Suzlon Energy Limited regarding calibration need issued on date 2009-11-17* • *JMR for the month of August 2008 for site-Village Jamade, District-Dhule.* • *JMR for the month of September 2009 for site-Village Jamade, District-Dhule and Nagaj, District Sangli*