



VERIFICATION / CERTIFICATION REPORT

“WIND POWER PROJECT IN GUJARAT, INDIA”

(UNFCCC Registration Ref. No. 7369)

Monitoring Period:
5 October 2012 to 30 April 2013

REPORT No. 2013-1047

REVISION No. 02

DET NORSKE VERITAS



VERIFICATION / CERTIFICATION REPORT

Date of first issue: 7 May 2013	Project No.: PRJC-468300-2013-CCS-IND	DNV CLIMATE CHANGE SERVICES AS Veritasveien 1, 1322 HØVIK, Norway Tel: +47 67 57 99 00 Fax: +47 67 57 99 11 http://www.dnv.com Org. No: NO 994 774 352 MVA
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Summary:

DNV Climate Change Services AS (DNV) has performed the verification of the emission reductions reported for the project activity "Wind Power Project in Gujarat, India" (UNFCCC Registration Ref. No. 7369) for the period 5 October 2012 to 30 April 2013.

In our opinion, the GHG emission reductions reported for the project in the monitoring report (version 4) of 13 August 2013 are fairly stated.

The GHG emission reductions were calculated correctly on the basis of the approved monitoring methodology ACM0002 (version 12.3.0) and the monitoring plan contained in the registered Project Design Document of 13 September 2012 and revised PDD dated 12 August 2013.

DNV Climate Change Services AS is able to certify that the emission reductions from the project activity "Wind Power Project in Gujarat, India" during the period 5 October 2012 to 30 April 2013 amount to 21 429 tonnes of CO₂ equivalent.

Report No.: 2013-1047		Subject Group: Environment	Indexing terms	
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Abbreviations

ABT	Availability based tariff
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction(s)
CL	Clarification request
CO ₂	Carbon dioxide
CO _{2e}	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
GETCO	Gujarat Energy Transmission Corporation Limited
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MoC	Modalities of communication
NEWNE	North East West and North-Eastern
PCP	Clean Development Mechanism Project Cycle Procedure
PDD	Project Design Document
PGVCL	Paschim Gujarat Vij Company Limited
PS	Clean Development Mechanism Project Standard
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Clean Development Mechanism Validation and Verification Standard
WEG	Wind Energy Generator



1 INTRODUCTION

M/s Vish Wind Infrastructure LLP has commissioned DNV Climate Change Services AS (DNV) to carry out the verification and certification of emission reductions reported for the CDM project activity 7369 “Wind Power Project in Gujarat, India” (the project) for the period 5 October 2012 to 30 April 2013. This report contains the findings from the verification and a certification statement for the certified emission reductions.

1.1 Objective

Verification is the periodic independent review and *ex post* determination by a Designated Operational Entity (DOE) of the monitored reductions in GHG emissions that have occurred as a result of the registered CDM project activity during a defined monitoring period.

Certification is the written assurance by a DOE that, during a specific period in time, a project activity achieved the emission reductions as verified.

The objective of this verification was to verify and certify emission reductions reported for the “Wind Power Project in Gujarat, India” for the period 5 October 2012 to 30 April 2013.

1.2 Scope

The scope of the verification is to verify that:

- The project activity has been implemented and operated in accordance with the registered PDD or any approved revised PDD;
- The monitoring plan complies with the monitoring methodology and the actual monitoring complies with the monitoring plan, including compliance with any guidance provided by the Board regarding deviations from the provisions of a registered plan and/or methodology;
- The data and calculation of GHG emission reductions have been assessed to correctly support the emission reductions being claimed.

The verification shall ensure that reported emission reductions are complete and accurate in order to be certified.

1.3 Description of the project activity

Project Parties:	India (host Party)
Title of project activity:	“Wind Power Project in Gujarat, India”
UNFCCC registration No:	7369
Baseline and monitoring methodology	ACM0002 (version 12.3.0)
Sectoral scope(s):	1
Project Participants:	M/s Vish Wind Infrastructure LLP
Location of the project activity:	Western region, Kutch district, Gujarat, India



Project's crediting period: 5 October 2012 to 04 October 2022 (fixed crediting period)

Period verified in this verification: 5 October 2012 to 30 April 2013 (1st verification period)

1.4 Methodology for determining emission reductions

According to the applied methodology ACM0002 (version 12.3.0) /18/, the emission reductions for the project are determined as the difference between the baseline emissions, project emissions and leakage:

$$ER_y = BE_y - PE_y - L_y$$

PE_y and L_y are considered as to be zero as stated in the registered PDD /11/ and validation report /12/. Therefore, the emission reductions are accounted as:

$$ER_y = BE_y = EG_{PJ,y} \times EF_{grid, CM, y}$$

where,

$EF_{grid, CM, y}$ is the combined margin emission factor of the NEWNE regional grid of India to which the project is connected, and was determined and validated *ex-ante* as 0.9527 tCO₂/MWh /11/ and will not be updated during the fixed crediting period.

$EG_{PJ,y}$ is the net electricity generation delivered to the NEWNE regional grid of India by the project activity, which is determined by the electricity exported to the NEWNE regional grid of India by the project activity minus the electricity imported from the NEWNE regional grid of India by the project activity.

2 METHODOLOGY

DNV has assessed and determined that the implementation and operation of the project activity, and the steps taken to report emission reductions comply with the CDM criteria and relevant guidance provided by the Board.

The assessment involved a desk review of relevant documentation as well as an on-site visit(s).

Verification team

Role	Last Name	First Name	Country	Type of involvement					
				Desk review	Site visit	Reporting	Supervision of work	Technical review	TA 1.2 competence
Team leader (Verifier)	Shome	Sharmistha	India	✓	✓	✓	✓		✓
Technical reviewer	Srivastava	Gaurav	India					✓	✓

***Duration of verification***

Monitoring report publication:	10 June 2013/13/
Desk review:	11 June 2013 to 20 June 2013
On-site assessment:	26 June 2013
Reporting, calculation checks and QA/QC:	23 June 2013 to 22 August 2013

2.1 Desk review

In addition to the monitoring report /1/ (version 2, dated 10 June 2013 and version 4 dated 13 August 2013), DNV reviewed:

- The PDD for the project activity (registered version 5 dated 13 September 2012 and updated version 6, dated 12 August 2013) /11/.
- The validation report of the project activity /12/.
- Baseline and monitoring methodology ACM0002, version 12.3.0 /18/.
- Emission reduction excel sheet /2/.
- Joint meter reading certificates and electricity invoices covering the current monitoring period /4/ & /5/.
- Certificate of share of electricity generated for the wind farm for M/s Vish Wind Infrastructure LLP for the current monitoring period /7/.
- Calibration certificates of the GETCO and ABT meters /10/.
- Monthly performance report, including daily generation and machines down time, for the current monitoring period /8/.
- Commissioning certificates of the project activity WEGs dated 13 April 2012, 13 June 2012, 12 July 2012 and 15 April 2013 /6/.
- Power purchase agreement between M/s Vish Wind Infrastructure LLP and Gujarat Urja Vikas Nigam Limited, dated 30 March 2012 and 21 March 2013 /3/.
- Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board.
- Other information and references relevant to the project activity's resulting emission reduction.

During the desk review, DNV has applied standard auditing techniques to assess the quality of information provided. The following activities were performed:

- A review of the data and information presented to verify their completeness /2/-/10/;
- A review of the monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures/4//5//8/&/10/;
- An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions/4//5//7//8//9/&/10/.



2.2 On-site assessment

Detailed verification of all the data contained in the monitoring report was performed during the site visit by DNV on 26 June 2013. All the WEGs installed as parts of this project activity were covered during the site visit to Kutch district of Gujarat state of India. The key personnel of the project were interviewed or assisted the verification team /19/-/23/.

During the on-site assessment, DNV has applied standard auditing techniques to assess the quality of information provided. The following aspects of the CDM project activity have been verified:

- An assessment of the implementation and operation of the registered project activity is as per the PDD for the project activity (registered PDD, version 5 dated 13 September 2012 and updated PDD version 6, dated 12 August 2013) /11/;
- The information flow for generating, aggregating and reporting of the monitoring parameters/4//5//7//8//9//10/; and
- The operational and data collection procedures are implemented in accordance with the monitoring plan in the PDD (registered PDD, version 5 dated 13 September 2012 and updated PDD version 6, dated 12 August 2013) /11/;
-

Further, the following activities were performed:

- A cross-check between information provided in the monitoring report and data from other sources /4//5//7//8//9//10/;
- A check of the monitoring equipment including calibration performance /10/ and observations of monitoring practices against the requirements of the PDD /11/ and the selected methodology /18/.
- A review of calculations and assumptions made in determining the GHG data and emission reductions /2/; and
- An identification that quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters/4//5//7//8//9//10/.

The data presented in the monitoring report was assessed by review of the detailed project documentation and electricity generation records, as well as by interviews with personnel at M/s Vish Wind Infrastructure LLP, and observation of collection of measurements, observation of established monitoring and reporting practices and assessment of the reliability of monitoring equipment. This has enabled the verification team to assess the accuracy and completeness of reported monitoring results; to verify the correct application of the approved monitoring methodology and the determination of the emission reductions.

In addition, all parameters required by the monitoring methodology ACM0002, version 12.3.0 /18/ and the management system were assessed during the site visit.

2.3 Closing out of verification findings

The objective of this phase of the verification was to resolve any issues which needed be clarified prior to DNV's conclusion that i) the project activity has been implemented and operated in accordance with the registered PDD or any approved revised PDD, ii) the monitoring plan complies with the monitoring methodology and the actual monitoring



complies with the monitoring plan and iii) the data and calculation of GHG emission reductions are correct.

A corrective action request (CAR) is issued, where:

- i. Non-conformities with the monitoring plan or methodology are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;
- ii. Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;
- iii. Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
- iv. Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.

A clarification request (CL) shall be raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

A forward action request (FAR) is issued for actions if the monitoring and reporting require attention and/or adjustment for the next monitoring period.

The verification identified three CARs and two CLs. The CARs and CLs were satisfactorily addressed by the project participant (please refer to Appendix A for further details).



3 VERIFICATION FINDINGS

This section summarises the findings from the verification of the emission reductions reported for the “Wind Power Project in Gujarat, India” for the period 5 October 2012 to 30 April 2013.

3.1 Remaining issues, CARs, FARs from previous validation / verification

This is the first verification of the project activity. There is no open issues in the validation stage /12/.

3.2 Post registration changes

The post registration changes described in Appendix B were identified by DNV during this verification. These post registration changes were assessed by DNV.

The post registration changes do not require prior approval by the CDM EB in accordance with Appendix 1 to the CDM Project Standard /16/. The assessment of the changes (in the form of a duly completed “Post-registration changes request form” (F-CDM-PRC) and DNV’s assessment opinion on the changes) is submitted together with the revised PDD (version 6, dated 12 August 2013) for acceptance by the CDM EB as part of the request for issuance for this monitoring period.

The post registration changes in the project activity are as follows:

(a) As per the registered PDD of the project activity, the installed capacity of the project is 36 MW comprising of 45 WEGs of 0.8 MW capacity each. It has been observed during the verification of the project activity that the actual installed capacity of the project activity is 32 MW, comprising of 40 WEGs of 0.8 MW each. It has been confirmed during the on-site visit and interview that due to the non-conductive soil condition of the respective locations of those 5 WEGs, these machines could not be installed. The actual installed capacity of the project activity has been verified from the commissioning certificates/6/. In line with paragraph 6 of Appendix 1 of clean development mechanism project standard/16/, the change in the project design does not require prior approval due to the followings:

- The change in the installed capacity of project activity from 36 MW to 32 MW does not impact the applicability of the methodology, ACM0002, version 12.3.0.
- The change in the capacity due to reduction of WEGs by 5 numbers has resulted to decrease in project cost and electricity generation by the project activity which reducing the flow of revenue from electricity sale. The additionality of the project activity has been assessed based on the changes of parameter- i) project cost, ii) installed capacity, iii) electricity generation and iv) project revenue. The decrease in installed capacity and thereby reduction in electricity generation has resulted to reduction in estimated emission reduction. The project cost per MW capacity, as verified from the registered PDD is INR 57.61 million/11/. Thus, the project cost for 32MW of installed capacity is INR 1843.46 million/14/ and the equity IRR calculated based on the revised input values is 9.29% /14/. As verified from the registered PDD, the equity benchmark of the project activity is 17.78%. Hence, the revised equity IRR of 9.29% is less than the applied and registered benchmark of 17.78%/11/. Since, the investment analysis has been performed on the basis of cost per MW, the revised



equity IRR, with revised investment cost and installed capacity, remains same with the registered PDD's equity IRR. The sensitivity analysis also demonstrates that the equity IRR of the project activity does not cross the benchmark of 17.78% with 10% fluctuation of project cost, tariff rate, plant load factor and operation and maintenance/14/. Thus, the additionality of the project activity is not changed.

- The change in the installed capacity does not impact the scale of the project activity as the same has been registered under large scale CDM projects.

(b) As per the registered PDD monitoring plan, the energy meters are to be calibrated annually /11/. The calibration of energy meters are under the control of state electricity board and beyond project participant's control. It has been verified from the letter to Enercon (India) Limited by Gujarat Energy Transmission Corporation Limited, dated 4 January 2012/9/, and the power purchase agreements/3/ that the calibration frequency of energy meters is once in 3 years and shall be performed by state electricity board. Thus, in line with paragraph 5 (b) of Appendix 1 of CDM project standard, the mentioned change in the calibration frequency of the energy meters do not require prior approval by the Board.

c) Furthermore, the name of the Enercon substation has been corrected to Rasaliya (Kotda Jadodar) instead of Lalpur (Dharampur) in the revised PDD, version 6, dated 12 August 2013/11/.

The assessment of compliance with the project description and the monitoring plan contained in the PDD, as described in the following sections, is based on the revised PDD (version 6 of 12 August 2013) /11/.

3.3 Project implementation

As part of the site visit DNV was able to confirm that the project implementation is in accordance with the project description contained in the PDD (registered version 5, dated 13 September 2012 and revised PDD, version 6, dated 12 August 2013).

The verification team confirmed through visual inspection and document review that all physical features of the WEGs of the proposed CDM project activity including data collection systems and storage systems have been implemented in accordance with the updated PDD/11/. DNV confirmed during the on-site visit that the CDM project is completely operational.

The project is a 32 MW wind power plant, located at Kutch district of Gujarat, India.

The project's installation capacity is 32 MW consisting of 40 wind energy generators (WEGs) of capacity of 0.8 MW each manufactured by Enercon (India) Limited. The details of the turbines and generators with respect to installation and capacity have been verified to be consistent with description indicated in the updated PDD. The actual implementation of the project during this verification period was verified in terms of installed capacities of WEGs, monitoring equipment and their accuracy levels during the site visit. The commissioning certificates of the project activity WEGs/6/ have been verified.

The electricity generated by the project activity is supplied to Gujarat Urja Vikas Nigam Limited. All the WEGs of the project activity are connected to a 66 kv sub-station-Rasaliya (Kotda Jadodar). The electricity supplied by the project activity is recorded by the energy main meters and check meters of the SEB substation. All meters are bidirectional with accuracy of 0.2s in line with the PDD /11/, which are used for measuring the electricity exported to and imported from the grid. The energy meters are locked to guarantee the



integrity of the instruments.

3.4 Information (data and variables) provided in the monitoring report that is different from that stated in the registered PDD

The net electricity generated for the monitoring period 5 October 2012 to 30 April 2013 by the project activity is 22 493 MWh /2/. The estimated net electricity generated by the project activity, as per the revised PDD with installed capacity of 32 MW, is 39 137.05 MWh for 208 days. Hence, actual generation is lower than the estimated electricity generation in the PDD/11/.

Emission reductions for the considered period (i.e. 208 days) as per estimates in the PDD	Actual Emission Reduction in this period (i.e. 208 days)	Variation (%)
37 285 tCO ₂	21 429 tCO ₂	43% (-)

The reduction in the electricity generation is due to low plant load factor and phase wise commissioning of the WEGs. The estimation of the CER in the PDD considers the operating of all the 40 WEGs, whereas, 32 WEGs were commissioned in April 2012 to July 12 (prior to the start of the present monitoring period) and remaining 8 WEGs in April 2013. Thus, all the WEGs were not operating for the complete monitoring period. The variation is deemed to be within a reasonable range due to uncertainty in the wind pattern which resulted in less PLF achieved during the verification period in comparison to PLF estimated in the updated PDD.

3.5 Compliance of monitoring plan with monitoring methodology

DNV is able to confirm that the monitoring plan contained in the PDD (revised PDD, version 6, dated 12 August 2013) is in accordance with the approved methodology applied by the project activity, i.e. ACM0002 (version 12.3).

3.6 Compliance of monitoring with the monitoring plan

The monitoring has been carried out in accordance with the monitoring plan contained in the updated PDD of 12 August 2013.

The below tables describe for each parameter, which is to be measured according to the monitoring plan, how DNV has verified that i) the actual monitoring complies with the monitoring plan and that ii) data have been assessed to correctly support the emission reductions being claimed.

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	EG _{facility, y} (EG _y) Quantity of net electricity supplied by the project activity to the grid (determined as the electricity exported to the NEWNE regional grid of India by the project activity minus the electricity imported from the NEWNE regional grid of India by the project activity)
Measuring frequency:	Electricity exported to the NEWNE regional grid of India by the project activity and the electricity



	imported from the NEWNE regional grid of India by the project activity are continuously measured.				
Reporting frequency:	Monthly in the form of GETCO share certificates/7/				
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes.				
Type of monitoring equipment:	Energy meter of 0.2s accuracy class (GETCO and ABT meters of line 1 and line 2 installed at the substation).				
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Yes, the accuracy class of the energy meter is as per the monitoring plan in the PDD.				
Calibration frequency /interval:	Once in three years as stated in revised PDD of 12 August 2013 .				
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications (if local/national standards or the manufacturer's specifications are not available, international standards may be used)?	The calibration frequency is as per the monitoring plan of the revised PDD, version 6, dated 12 August 2013. It has been verified from the letter to Enercon (India) Limited by Gujarat Energy Transmission Corporation Limited, dated 4 January 2012/9/, and the power purchase agreements/3/ that the calibration frequency of energy meters is once in 3 years and shall be performed by state electricity board.				
Is the calibration of measuring equipment carried out by an accredited person or institution?	The energy meter calibration has been performed by by PGVCL.				
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes, the calibration certificates confirm the proper functioning of the energy meters.				
Is(are) calibration(s) valid for the whole reporting period?	Yes, the calibration is valid for the complete monitoring period. Meter installation and calibration certificate for the project activity/10/:				
	Meter Type	Meter Sr. no.	Sub station	Accuracy class	Calibration date applicable to the monitoring period
	GETCO Meter	GJU 631 58	Rasaliya Sub-station	0.2s	30- September- 2011



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	(Line 1)		(66 KV), Kutch, Gujarat		
	GETCO Meter (Line 2)	GJU 631 59			30- September-2011
	ABT Meter (Line 1)	GJ-097 8-A	Rasaliya Sub-station (66 KV), Kutch, Gujarat	0.2s	7-March-2012
	ABT Meter (Line 2)	GJ-097 9-A			7-March-2012
If applicable, has the reported data been cross-checked with other available data?		The net electricity generation has been cross checked from the invoices to Gujarat Urja Vikas Nigam Limited/5/.			
How were the values in the monitoring report verified?		Data for the apportioning is sourced from GETCO share certificates/7/, JMRs/4/ and daily generation data (LCS meter reading) /8/.			
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?		Yes.			
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?		Not applicable			

The project activity has been commissioned in two phases; first phase consists of installation of 24 MW in April 2012 to July 2012 and remaining 8 MW was commissioned in April 2013 /6/. Total capacity of the project activity is divided into three clusters. Each cluster has the dedicated metering arrangement. The total installed capacity of the wind farm, having 78 WEGs of 0.8 MW capacity, is 62.4 MW and the same is divided into the cluster of 20.8 MW, 26.4 MW and 15.2 MW. This has been verified from the power purchase agreements and GETCO share certificate. The cluster of 15.2 MW, consisting of 19 WEGs, of which 8 WEGs belongs to the project activity, commissioned in April 2013.

The capacity of 32 MW of the project activity, consisting of 40 WEGs of 0.8MW capacity each, are distributed in the cluster of 20.8 MW, 26.4 MW and 15.2 MW. Since the GETCO share certificate does not depict the net electricity generated by the 40 WEGs numbers of project activity WEGs in each clusters, the net electricity generated by the same has been calculated by apportioning procedure using the GETCO share certificate and the LCS meters data for WEG wise generation. The JMR /4/ and GETCO share certificate/7/ of the cluster of 20.8MW, 15.2 MW and 26.4MW are used to for the export and import electricity value for



the monitoring period. The LCS meter reading of the wind farm is maintained and archived continuously by Enercon (India) Limited /8/. As mentioned in Annex 4 of the registered PDD /11/, cumulative LCS meter reading for each month is used for the purpose of allocation of net electricity supplied to the grid from the project activity. The apportioning has been performed as follows:

$$EG_{PJ,y} = EG_{GETCO,NET\ Supply} \times EG_{LCS,EXPORT} / EG_{LCS,WF,EXPORT}$$

Where,

- $EG_{PJ,y}$ is the net electricity by WEG of the project activity
- $EG_{GETCO,NET\ Supply}$ is the net electricity supplied by the WEGs cluster (20.8 MW, 15.2MW and 26.4MW). This is calculated from the electricity exported minus electricity import as per the JMRs /4/ and GETCO share certificate /7/. The net electricity provided in GETCO share certificate and JMRs are given after adjusting for the transmission losses.
- $EG_{LCS,EXPORT}$ is the electricity generated and supplied by the project activity WEG measured at LCS meter.
- $EG_{LCS,WF,EXPORT}$ is the electricity generated by the wind farm. Cumulative of the LCS reading of all the 78 WEGs.

$EG_{facility,y}$ (EG_y) is the summation of the net electricity generated by the project activity WEG, $EG_{PJ,y}$.

The LCS meters does not require the to be calibrated and any error in the LCS meters shall result to the shut down of the WEG and generation of error report/11/. $EG_{LCS,EXPORT}$ and $EG_{LCS,WF,EXPORT}$ has been verified from the daily generation and monthly cumulative data maintained by Enercon (india) Limited/8/. The apportioning calculation has been provided in the excel sheet /2/ and verified by DNV.

3.7 Assessment of data and calculation of emission reductions

DNV confirms that appropriate methods and formulae for calculating baseline emissions, project emissions and leakage have been followed, and the assumptions, emission factors and default values that are applied in the calculation have been justified.

As stated in the section 1.4, the emission reductions by the project activity during the monitoring period is the difference between the baseline emission (BE_y), project emissions (PE_y) or leakage (L_y).

$$ER_y = BE_y - PE_y - L_y$$

3.7.1 Baseline emissions

Baseline emissions (BE_y in tCO_2) are the product of the baseline emission factor (EF_y in tCO_2/MWh) times the net electricity supplied by the project activity to the grid (EG_y in MWh).

EF_y is emission factor of the grid, which was calculated *ex-ante* and will not be updated during the fixed crediting period. EF_y of the proposed project in the registered PDD /11/ is $0.9527\ tCO_2/MWh$, which has been verified to be correct based on the availability of grid data.

EG_y is the net electricity generation supplied to the grid is verified from the GETCO share certificates/7/, JMRs/4/ and daily generation data (LCS meter reading)/8/ and apportioning calculation/2/. This has been cross-checked from invoices/5/.

Hence,



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$EG_y = 22\,493$ MWh, and

$BE_y = EF_y * EG_y = 21\,429$ tCO₂e

3.7.2 Project emissions

The project emissions are regarded as zero according to the methodology ACM0002, version 12.3.0 and PDD/11/.

3.7.3 Leakage

There are no leakages that need to be considered in applying the methodology ACM0002, version 12.3.0 and PDD/11/.

3.7.4 Emission reductions

Therefore, the emission reductions in this monitoring period are:

$ER_y = BE_y - PE_y - L_y = 21\,429 - 0 - 0 = 21\,429$ tCO₂e.

The emission reduction, post 2012, for the period from 1 January 2013 to 30 April 2013 is 13 928 tCO₂. This is based on the apportioning based on the data sourced from GETCO share certificates/7/, JMRs/4/ and daily generation data (LCS meter reading)/8/ from 1 January 2013 to 30 April 2013.

Emission reduction till 2012 (tCO ₂) for the present verification period	Emission reduction post 2012 (tCO ₂)
7 501	13 928

As outlined above, the input data for calculating the emission reductions, the calculating process and the result are complete and transparent. Therefore, DNV is able to confirm the accuracy of the emission reductions.

3.8 Quality of evidence to determine emission reductions

DNV confirms that a complete set of data for this monitoring period was available to be verified and was in accordance with the monitoring plan provided in updated PDD /11/.

All necessary documentation were collected, referenced and aggregated and were easily accessible in hard-copy and electronic format. Measurements are performed by calibrated equipment/10/, and the key data were cross-checked via other sources (invoices)/5/. No assumptions are used that have any material influence on reported emission reductions.

3.9 Management system and quality assurance

M/s Vish Wind Infrastructure LLP is the overall responsible for the project activity. Enercon (India) Limited is responsible for the operation and maintenance of the project, the monitoring equipments and data collection. The management system for the project has been verified to be in place by DNV on site. The organization structure with the responsibilities, personnel competencies, monitoring procedure and monitoring management have been properly identified and put into operation.

DNV confirms that the responsibilities and authorities in the management and operational system for monitoring and reporting are in accordance with the responsibilities and authorities stated in the in the updated PDD /11/.



4 CERTIFICATION STATEMENT

DNV Climate Change Services AS (DNV) has performed the verification of the emission reductions that have been reported for the CDM project activity 7369 “Wind Power Project in Gujarat, India” for the period 5 October 2012 to 30 April 2013.

The project participant is responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

It is DNV’s responsibility to express an independent verification statement on the reported GHG emission reductions from the project activity. DNV does not express any opinion on the selected baseline scenario or on the validated and registered PDD.

DNV conducted the verification on the basis of the baseline and monitoring methodology ACM0002 (version 12.3.0), the monitoring plan contained in the PDD (version 5 of 13 September 2012 and version 6, dated 12 August 2013) and the monitoring report (version 4) dated 13 August 2013. The verification included i) checking whether the provisions of the monitoring methodology and the monitoring plan were consistently and appropriately applied and ii) the collection of evidence supporting the reported data.

DNV’s verification approach draws on an understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. DNV planned and performed the verification by obtaining evidence and other information and explanations that DNV considers necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In our opinion the GHG emissions reductions reported for the project activity for the period 5 October 2012 to 30 April 2013 are fairly stated in the monitoring report (version 4) dated 13 August 2013.

The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology ACM0002 (version 12.3) and the monitoring plan contained in the PDD (registered version 5 of 13 September 2012 and updated version 6, dated 12 August 2013).

DNV Climate Change Services AS is able to certify that the emission reductions from the CDM project activity 7369 “Wind Power Project in Gujarat, India” during the period 5 October 2012 to 30 April 2013 amount to 21 429 tonnes of CO₂ equivalent.

Bangalore and Oslo, 22 August 2013

Sharmistha Shome
Verifier
DNV Bangalore, India

Ole A. Flagstad
Approver,
DNV Climate Change Services AS



5 REFERENCES

Documentation provided by the project participants

/1/	M/s Vish Wind Infrastructure LLP: <i>CDM monitoring report for project activity 7369 “Wind Power Project in Gujarat, India” for the monitoring period 5 October 2012 to 30 April 2013, Version 02 dated 10 June 2013 and version 4 dated 13 August 2013.</i>																					
/2/	M/s Vish Wind Infrastructure LLP: Emission reduction excel sheet, dated 13 August 2013																					
/3/	Gujarat Urja Vikas Nigam Limited: Power purchase agreement between M/s Vish Wind Infrastructure LLP and Gujarat Urja Vikas Nigam Limited, dated 30 March 2012 and 21 March 2013.																					
/4/	Gujarat Energy Transmission Co. Ltd: Joint meter reading for the complete monitoring period 5 October 2012 to 30 April 2013																					
/5/	M/s Vish Wind Infrastructure LLP: electricity invoices rasied to the state electricity board (Gujarat Urja Vikas Nigam Limited) for the monitoring period 5 October 2012 to 30 April 2013.																					
/6/	Gujarat Energy Development Agency: Commissioning certificates of the project activity WEGs dated 13 April 2012, 13 June 2012, 12 July 2012 and 15 April 2013.																					
/7/	Gujarat Energy Transmission Corporation Limited: Certificate of share of electricity generated by the wind farm for M/s Vish Wind Infrastructure LLP for the monitoring period 5 October 2012 to 30 April 2013.																					
/8/	Enercon (India) Limited: Monthly performance report, including daily generation and machines down time, for the monitoring period 5 October 2012 to 30 April 2013.																					
/9/	Gujarat Energy Transmission Corporation Limited: Letter to Enercon (India) Limited confirming that the calibration frequency of energy meters as once in 3 years, dated 4 January 2012.																					
/10/	<div>Gujarat Energy Transmission Corporation Limited: Meter installation and calibration certificate for the project activity:</div> <table><tr><th>Meter Type</th><th>Meter Sr. no.</th><th>Sub station</th><th>Accura cy class</th><th>Calibration date applicable to the monitoring period</th></tr><tr><td>GETCO Meter (Line 1)</td><td>GJU631 58</td><td rowspan="2">Rasaliya Sub-station (66 KV), Kutch, Gujarat</td><td rowspan="2">0.2s</td><td>30- September-2011</td></tr><tr><td>GETCO Meter (Line 2)</td><td>GJU631 59</td><td>30- September-2011</td></tr><tr><td>ABT Meter (Line 1)</td><td>GJ-0978-A</td><td rowspan="2">Rasaliya Sub-station (66 KV), Kutch, Gujarat</td><td rowspan="2">0.2s</td><td>7-March-2012</td></tr><tr><td>ABT Meter (Line 2)</td><td>GJ-0979-A</td><td>7-March-2012</td></tr></table>	Meter Type	Meter Sr. no.	Sub station	Accura cy class	Calibration date applicable to the monitoring period	GETCO Meter (Line 1)	GJU631 58	Rasaliya Sub-station (66 KV), Kutch, Gujarat	0.2s	30- September-2011	GETCO Meter (Line 2)	GJU631 59	30- September-2011	ABT Meter (Line 1)	GJ-0978-A	Rasaliya Sub-station (66 KV), Kutch, Gujarat	0.2s	7-March-2012	ABT Meter (Line 2)	GJ-0979-A	7-March-2012
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GETCO Meter (Line 2)	GJU631 59			30- September-2011																		
ABT Meter (Line 1)	GJ-0978-A	Rasaliya Sub-station (66 KV), Kutch, Gujarat	0.2s	7-March-2012																		
ABT Meter (Line 2)	GJ-0979-A			7-March-2012																		



Other project documents or documents used by DNV to verify the information provided by the project participants

/11/	Vish Wind Infrastructures LLP: Registered <i>CDM-PDD for project activity</i> “Wind Power Project in Gujarat, India”, version 5 of 13 September 2012 and revised CDM-PDD, version 6, dated 12 August 2013.
/12/	KBS Certification Services Pvt. Ltd.: Validation report for the project activity 7369 “Wind Power Project in Gujarat, India”. Report No. CDM.12.VAL.032, dated 13 September 2012. http://cdm.unfccc.int/Projects/DB/KBS_Cert1348205866.92/view
/13/	UNFCCC” confirmation mail on the webhosting of monitoring report for the 5 October 2012 to 30 April 2013, dated 10 June 2013.
/14/	Vish Wind Infrastructures LLP: Registered IRR excel sheet of <i>CDM for project activity</i> “Wind Power Project in Gujarat, India”, version 1, dated 13 September 2012 and revised IRR excel sheet, version 2, dated 11 July 2013.

Methodologies, tools and other guidance by the CDM Executive Board

/15/	CDM Executive Board: <i>Clean Development Mechanism Validation and Verification Standard</i> , version 04.0
/16/	CDM Executive Board: <i>Clean Development Mechanism Project Standard</i> , version 04
/17/	CDM Executive Board: <i>Clean Development Mechanism Project Cycle Procedure</i> , version 04
/18/	CDM Executive Board: <i>Baseline and monitoring methodology</i> ACM0002, version 12.3.0.

Persons interviewed during the verification

/19/	Mr. Nilam Rabari – Wind World (I) Limited.
/20/	Mr. Ritesh N Chauhan - Wind World (I) Limited.
/21/	Mr. Armesh Kumar – Wind World (I) Limited.
/22/	Mr. Navneet Kumar – Wind World (I) Limited.
/23/	Mr. Jayant – Wind World (I) Limited.

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APPENDIX A

CORRECTIVE ACTION REQUESTS, CLARIFICATION REQUESTS AND FORWARD ACTION REQUESTS

Corrective action requests

CAR ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CAR 1	Calibration details and metering details are not mentioned in the webhosted MR. Source of data mentioned in section D.2 of webhosted MR is not in consistence with registered PDD. In the registered PDD, the source of data is mentioned as "Sharing certificate issued by GETCO/GEDA".	<p>The same has been mentioned in the revised MR. Please refer to section C of the revised MR.</p> <p>The section D.2 of the MR has been made consistent with the registered PDD.</p>	<p>The MR has been adequately revised to include the calibration details of the energy meters.</p> <p>The MR has been revised to correctly mention the source of data as GETCO share certificates.</p> <p>OK. CAR 1 is closed.</p>
CAR 2	The reason for not installing the 4 WEGs to be clarified with supporting documentation. Revised PDD, as required for the PRC, has not been submitted.	<p>In the registered PDD, the capacity of the project activity has been considered as 36 MW, whereas the actual installed capacity of the project activity is 32 MW. Five machines of the same capacity (4 MW) could not be installed due to non-conductive soil condition at the respective locations. This does not require any prior approval in line with the para 4 of Appendix 1 of Clean development mechanism project standard, Version 04.0.</p> <p>The revised PDD has also been provided in line with the above.</p>	<p>Installation of 40 WEGs has been confirmed during the on-site visit and interview that due to the non-conductive soil condition of the respective locations of those 5 WEGs, these machines could not be installed.</p> <p>The revised PDD has been submitted to DNV.</p> <p>OK. CAR 2 is closed.</p>
CAR 3	As per the registered monitoring plan, the calibration of the energy meters shall be conducted once in a year. The actual calibration performed for the meters, as per PPA, is found to be once in three year. The calibration frequency does not match the calibration frequency mentioned in the registered PDD.	The calibration of the meters is beyond the control of the PP and is the responsibility of the State utility. Further, the State utility has issued the letter that the calibration of the meters will be performed once in three years. Accordingly, the calibration frequency has been changed to once in there years. This is also in line with the Power Purchase Agreement (PPA). This further satisfies para 5 (a) of the Appendix 1 of the CDM project standard and is beyond the control of the PP and does not have any impact on the emission reduction calculation. Hence, does not require any prior approval. The same has been revised in the PDD along with the name change of	<p>It has been verified from the letter to Enercon (India) Limited by Gujarat Energy Transmission Corporation Limited, dated 4 January 2012/9/, and the power purchase agreements/3/ that the calibration frequency of energy meters is once in 3 years and shall be performed by state electricity board.</p> <p>The calibration of the meters are beyond the control of the project participant. Revised PDD with the change in the calibration plan has been submitted for post registration change to DNV.</p> <p>OK. CAR 3 is closed.</p>

CAR ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
		the sub-station. The same has also been mentioned in the revised MR. Please refer to the section B.2.2 & B.2.3 of the revised MR.	
CL ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CL 1	Total down time is not mentioned in the webhosted monitoring report.	The same has been mentioned in the revised MR. Please refer to section B.1 of the revised MR.	The down time pattern has been mentioned in the MR. OK. CL 1 is closed.

CAR ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CL 2	<p>Further clarification is sort for the reason for not considering VCB meters for apportioning, as mentioned in the registered PDD.</p> <p>The PPA of 26.4 MW has not been submitted.</p>	<p>As per the registered PDD, the net electricity supplied to the grid has been sourced directly from the GETCO share certificate and will be further cross-checked with the invoices.</p> <p>However, in case of the project activity, the PP has a total installed capacity of 47.2 MW till the month of March, 2013, connected to the Rasaliya sub-station with a bi-furcation of 20.8 MW & 26.4 MW of capacity. Under which, some machines of the project activity comes under 20.8 MW & rest of the machines comes under 26.4 MW, which is further reflected in the GETCO share certificate. Therefore, GETCO share certificate does not exclusively depict the generation data proposed for the project activity.</p> <p>The apportionment procedure and the capacity wise bi-furcation which has been done at the GETCO substation to generate the share certificate are performed by the state utility and PP does not have any control on both the procedures. This capacity wise bi-furcation is also done based on the PPA signed under the supervision of the state utility.</p>	<p>All the PPAs are submitted to DNV. The project activity has been commissioned in two phases; first phase consists of installation of 24 MW in April 2012 and remaining 8 MW was commissioned in April 2013/6/. The total installed capacity of the wind farm, having 78 WEGs of 0.8 MW capacity, is 62.4MW and the same is divided into the cluster of 20.8 MW, 26.4 MW and 15.2 MW.</p> <p>32 MW of the project activity, consisting of 40WEGs of 0.8MW capacity each, are distributed in the cluster of 20.8MW and 26.4MW and 15.2 MW. Since the GETCO share certificate does not depict the net electricity generated by the 40 numbers of project activity WEGs in each of the clusters, the net electricity generated by the same has been calculated by apportioning procedure using the GETCO share certificate and the LCS meters data for WEG wise generation. The JMRs and GETCO share certificates of the cluster of 20.8MW, 15.2MW and 26.4MW are used to for the export and import electricity value for the monitoring period. The LCS meter reading of the wind farm is maintained and archived continuously by Enercon (India) Limited/8/. As mentioned in Annex 4 of the registered PDD /11/, cumulative LCS meter reading for each month is used for the purpose of allocation of net electricity supplied to the grid from the project activity.</p> <p>OK. CL 2 is closed.</p>

Forward action requests from previous verification

FAR ID	Forward action request	Summary of how FAR has been addressed in this reporting period	Assessment of how FAR has been addressed
FAR 1	Not applicable		

Forward action requests from this verification

FAR ID	Forward action request	Response by Project Participants
FAR 1	No FAR has been raised in this verification.	

APPENDIX B

POST REGISTRATION CHANGES

Type of post registration change	Description of post registration change*	Is prior approval by CDM EB required**?	In case prior approval by CDM EB is required, when was post registration change approved?
Corrections	The name of the Enercon substation has been corrected to Rasaliya (Kotda Jadodar) instead of Lalpur (Dharampur) in the revised PDD, version 6, dated 11 July 2013/11/.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not applicable	<i>Not applicable</i>
Temporary deviations from the registered monitoring plan and/or monitoring methodology	Not applicable <i>(Refer also to 3.6 for the assessment of the parameter(s) which were temporarily not monitored)</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not applicable	DD MMM YYYY (I-DEV-XXXX)
Permanent changes from the registered monitoring plan or applied methodology	As per the registered PDD monitoring plan, the energy meters are to be calibrated annually. The calibration of energy meters are under the control of state electricity board and beyond project participant's control. It has been verified from the letter to Enercon (India) Limited by Gujarat Energy Transmission Corporation Limited, dated 4 January 2012/9/, and the power purchase agreements/3/ that the calibration frequency of energy meters is once in 3 years and shall be performed by state electricity board. Thus, in line with paragraph 5 (a) of Appendix 1 of CDM project standard, the mentioned change in the calibration frequency of the energy meters do not require prior approval by the Board.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not applicable	<i>Not applicable</i>

Type of post registration change	Description of post registration change*	Is prior approval by CDM EB required**?	In case prior approval by CDM EB is required, when was post registration change approved?
Changes to the project design of a registered project activity	<p>As per the registered PDD of the project activity, the installed capacity is of 36MW comprising of 45 WEGs of 0.8MW capacity each. It has been observed during the verification of the project activity that the actual installed capacity of the project activity is 32 MW, comprising of 40 WEGs of 0.8 MW each. It has been confirmed during the on-site visit and interview that due to the non-conductive soil condition of the respective locations of those 5 WEGs, these machines could not be installed. The actual installed capacity of the project activity has been verified from the commissioning certificates/6/. In line with paragraph 6 of Appendix 1 of clean development mechanism project standard/16/, the change in the project design does not require prior approval due to the followings:</p> <ul style="list-style-type: none"> • The change in the installed capacity of project activity from 36 MW to 32 MW does not impact the applicability of the methodology, ACM0002, version 12.3. <p>The change in the capacity due to reduction of WEGs by 5 numbers has resulted to decrease in project cost and electricity generation by the project activity which reducing the flow of revenue from electricity sale. The additionality of the project activity has been assessed based on the changes of parameter- i) project cost and ii) installed capacity, iii) electricity generation and iv) project revenue. The project cost per MW capacity, as verified from the registered PDD is INR 57.61 million/11/.</p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not applicable	<i>Not applicable</i>

Type of post registration change	Description of post registration change*	Is prior approval by CDM EB required**?	In case prior approval by CDM EB is required, when was post registration change approved?
	<p>Thus, the project cost for 32MW of installed capacity is INR 1843.46 million/14/ and the equity IRR calculated based on the revised input values is 9.29% /14/. As verified from the registered PDD, the equity benchmark of the project activity is 17.78%. Hence, the revised equity IRR of 9.29% is less than the applied and registered benchmark of 17.78%/11/. Since, the investment analysis has been performed on the basis of cost per MW, the revised equity IRR, with revised investment cost and installed capacity, remains same with the registered PDD's equity IRR. The sensitivity analysis also demonstrates that the equity IRR of the project activity does not crosses the benchmark of 17.78% with 10% fluctuation of project cost, tariff rate, plant load factor and operation and maintenance/14/. Thus, the additionality of the project activity is not changed.</p> <ul style="list-style-type: none"> • The change in the instal capacity does not impact the scale of the project activity as the same has been registered under large scale CDM projects. 		

* For further details refer to the “Post-registration changes request form” (F-CDM-PRC) and DNV’s assessment opinion on the changes

** Refer to Appendix 1 Appendix 1 to the CDM Project Standard /16/. /

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APPENDIX C

CURRICULA VITAE OF THE VERIFICATION TEAM MEMBERS

Sharmistha Shome, DNV Bangalore, India holds a Master's Degree in Energy Systems. Her educational qualification covers the fields of sustainable development, power plant technology, renewable energy technology, performance of thermal & electrical utilities and project financing.

She has experience in validation and verification of several CDM projects/JI and other 3rd party validation/verification services.

She has completed the ISO14001 EMS Lead Auditor course. Her qualification and experience in CDM demonstrate her sufficient sectoral competence in renewable energy sector (TA 1.2).

Gaurav Srivastava holds a Master's Degree in Energy Systems. His educational qualification covers the fields of sustainable development, power plant technology, renewable energy technology, performance of thermal & electrical utilities and project financing. He has completed ISO 14001:2004 - Environmental Management System Auditor / Lead Auditor Program, certified by IRCA.

He has experience of more than five years in validation and verification of numerous CDM projects in DNV, both in India & abroad. His qualification, training and experience in CDM demonstrate his sufficient sectoral competence in energy generation from renewable energy sources.