



VOLUNTARY CARBON STANDARD 2007.1

VERIFICATION REPORT

WIND BASED RENEWABLE ENERGY PROJECT IN GUJARAT

Monitoring Period: 12/04/2008 to 12/02/2010

(incl. both days)

Report No: 8106640805-10/99

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Name of Verification company:	Date of the issue:
TÜV NORD CERT GmbH	2010-10-20
Report Title:	Approved by:
Wind based renewable energy project in Gujarat	Rainer Winter
Client:	Project Title:
Gujarat Paguthan Energy Corporation Private Limited (GPECL)	Wind based renewable energy project in Gujarat
Summary:	
The verification statement will be provided as part of the final verification report.	

Gujarat Paguthan Energy Corporation Private Limited (GPECL) has commissioned the TÜV NORD JI / CDM Certification Program to carry out the verification of the Project “Wind based renewable energy project in Gujarat”, India with regard to the requirements of VCS 2007.1 Standard.

The project activity involves an initiative by Gujarat Paguthan Energy Corporation Private Limited to export renewable electricity produced by Wind Electric Generator (WEGs) to the power deficit NEWNE regional grid in order to decrease power shortage, diversify the grid and eventually to reduce the greenhouse gas emissions.

The wind power generated from the project is displacing the equivalent amount of electricity which would have otherwise generated by the fossil fuels intensive plants connected to the NEWNE grid. Since wind power is clean and Green House Gas (GHG) emissions free, the power generated will prevent the anthropogenic green house gas emissions generated by the fossil fuel based thermal power stations. The estimation of GHG reductions by this project is limited to carbon dioxide (CO₂) only.

Reporting period: From 12/04/2008 to 12/02/2010

In the course of verification (08) Corrective Action Requests (CARs), (01) Clarification Requests (CLs) and (00) Forward Action Request (FAR) were raised and successfully closed.

The verification is based on the draft monitoring report^{/MR1/}, revised monitoring report^{/MR2/} and the monitoring plan as set out in the registered PDD, (Ref No. 2925, registration date: 13/02/2010).

The validation report, emission reduction calculation spreadsheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

As the result of the 1st periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements and is in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Period	Emission Reduction t CO2 eq
12 April 2008 to December 2008	19,483
January 2009 to December 2009	88,002
January 2010 to 12 February 2010	11,009
Total Emission reductions	118,494

Work carried out by:	Number of pages:
Mr Archak Pattnaik Mr Abhishek Kumar Srivastava Mr Prakash Kumar Mishra Ms Arshi Vimal	35

Abbreviations

BAU	Business as usual
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CO₂	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
CP	Certification Program
CL	Clarification Request
DGVCL	Dakshin Gujarat Vij Company Limited
DNA	Designated National Authority
EB	CDM Executive Board
EIA	Environmental Impact Assessment
ER	Emission Reduction
FAR	Forward Action Request
GEDA	Gujarat Energy Development Agency
GPECL	Gujarat Paguthan Energy Corporation Private Limited
GETCO	Gujarat Energy Transmission Company Limited.
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LOG	Generation log sheet
MP	Monitoring Plan
MR	Monitoring Report
PPA	Power Purchase Agreement
QC/QA	Quality control/Quality assurance
SC	Share certificate for net electricity supplied to the grid
TPL	Torrent Power Limited
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Voluntary Carbon Standard
VCS - PD	VCS - Project Description
VCU	Voluntary Carbon Unit
VVM	Validation and Verification Manual
WEGs	Wind Electric Generators

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1 INTRODUCTION

The Gujarat Paguthan Energy Corporation Private Limited has commissioned the TÜV NORD JI/CDM Certification Program to carry out the verification of the “Wind based renewable energy project in Gujarat” with regard to the relevant requirements of the Voluntary Carbon Standard 2007.1^{/VCS/}. The verifiers have reviewed the implementation of the monitoring plan (MP) in the registered CDM project Design Document ^{/PDD/} (Ref No. 2925, registration date: 13/02/2010) for the monitoring period 12/04/2008 to 12/02/2010.

The applied monitoring methodology is “Consolidated baseline methodology for grid-connected electricity generation from renewable sources version 08”.

1.1 Objective

The purpose of this verification, by independent check of objective evidence, is as follows:

- to verify that the project is implemented as described in the project design document^{/PDD/}
- to assess the implementation of the monitoring plan (MP) content in the registered CDM-PDD;
- to assess the project's compliance with other relevant rules, including the host country (India) legislation;
- to confirm that the monitoring system is implemented and fully functional to generate voluntary emission reductions (VERs / VCUs) without any double counting; and
- to establish that the data reported are accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emissions reduction calculation.

1.2 Scope and Criteria

The verification of this project is based on the validated project design document ^{/CDM-PDD/}, monitoring report^{/MR1,MR2/}, emission reduction calculation spread sheet^{/XLS1&2/}, supporting documents made available to the verifier and information collected through on-site assessment and conducting interviews during and after the site visit. Furthermore publicly available information was considered as far as available and required.

The TÜV NORD JI/CDM CP has employed a risk-based approach in the verification, focusing on the identification of significant risks and reliability of project monitoring and generation of emission reductions.

1.3 VCS Project Description

1.3.1 Project Characteristics

Essential data of the project is presented in the following Table 1-1.

Table 1-1: Project Characteristics

Item	Data
Project title	Wind based renewable energy project in Gujarat
Project owner	Gujarat Paguthan Energy Corporation Private Limited (GPECL)
Any specific project categories	☐ Mega project ($> 10^6$ t CO _{2eq} / a) ☐ Micro project (< 5000 t CO _{2eq} / a) ☐ AFOLU project ☐ Grouped project ☒ No specific project category
VCS PD dated	Draft: 2010-03-08 Final: 2010-05-03
Applied Methodology	(ACM0002) Consolidated baseline methodology for grid-connected electricity generation from renewable sources version 08"
Project starting date	2008-04-12
Crediting period	☐ Renewable Crediting Period (10 y) ☒ Fixed Crediting Period (10 y)
Start of crediting period	2008-04-12

1.3.2 Project Location

The details of the project location are given in table 1-2:

Table 1-2: Project Location

No.	Project Location
Host Country	India
Region:	Jamnagar district in Gujarat
Project location address:	Kalavad and Jam jodhpur taluka of Jamnagar district in Gujarat

1.3.3 Technical Project Description

WEGS produce electricity by using the natural power of wind. Wind has considerable amount of kinetic energy when blowing at high speeds. When this kinetic energy passes over the blades of the WEGS, it is converted into mechanical energy and rotates the wind blades. When the wind blades rotate, the connected generator also rotates, thereby producing electricity. The project activity involves the installation of 63 WEGs of E-53 Enercon make of total installed capacity 50.4 MW. Each individual WEGS has a rating capacity of 800 kW.

The key parameters of the project are given in table 1-3:

Table 1-3a: Technical data of the project

Parameter	Unit	Value
Rated capacity	kW	800
Rotor diameter	M	53
Hub height	m	75
Number of blades	Number	3
Swept area	m ²	2196.75
Rotor speed	rpm	12-19
Tip speed	m/s	80 (maximum)
Cut-in Wind Speed	m/s	3
Rated Wind Speed	m/s	12 .6

Table 1-3b: Parameters confirmed during verification

Parameter	Name	Unit	Value
EGy	Net Quantity of Electricity exported	MWh/yr	131,542,696

1.3.4 Appointment of team members and technical reviewer

On the basis of a competence analysis and individual availabilities a verification team was appointed. Furthermore also the personnel for the technical review and the final approval were determined.

The list of involved personnel, the tasks assigned and the qualification status are summarized in the table 1-4 below.

Table 1-4: Involved Personnel

Name	Company	Function ¹⁾	Qualification Status ²⁾	Sectoral competence	Technical competence	Host country Competence	Controlling competence
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	Name	Company	Function ¹⁾	Qualification Status ²⁾	Sectoral competence	Technical competence	Host country Competence	Controlling competence
☒ Mr. ☐ Ms.	Archak Pattanaik	TUV Pvt.Ltd India	TL	A	☒	☐	☒	☒
☒ Mr. ☐ Ms.	Abhishek Kumar Srivastava	TUV Pvt.Ltd India	TM	E	☒	☒	☒	☐
☒ Mr. ☐ Ms.	Prakash Kumar Mishra	TUV Pvt.Ltd India	TM	E	☒	☐	☒	☐
☐ Mr. ☒ Ms.	Arshi Vimal	TUV India Pvt.Ltd	-	T	☐	☐	☒	☐
☒ Mr. ☐ Ms.	Ingo Klein	TN CERT	TR	A	☒	☒	☐	☒
☒ Mr. ☐ Ms.	Samir Beqqal	TN CERT	TR	E	☒	☐	☐	☐
☒ Mr. ☐ Ms.	Rainer Winter	TN CERT	FA	SA	☒	☒	☐	☒

¹⁾ TL : Team Leader; TM : Team Member, TR: Technical review; FA: Final approval;

²⁾ GHG Auditor Status: A : Assessor; E : Expert; SA: Senior Assessor; T : Trainee; TE Technical Expert

1.4 Level of Assurance

The verification has been planned and organized to achieve a

☒ reasonable level of assurance

☐ limited level of assurance.

2 METHODOLOGY

The verification of the project consisted of the following steps:

- Contract review
- Appointment of team members and technical reviewers
- Publication of the monitoring report
- Desk review of the Monitoring Report^{/MR/} submitted by the client and additional supporting documents.
- Verification planning,
- On-Site assessment,
- Background investigation and follow-up interviews with personnel of the project developer and its contractors,
- Draft verification reporting
- Resolution of corrective actions (if any)
- Final verification reporting
- Technical review
- Final approval of the verification.

The sequence of the verification is given in the table 2.1 below:

Table 2.1: Verification sequence

Topic	Time
Assignment of verification	2010-03-03
On-site visit	2010-03-16
Draft reporting finalised	2010-03-19
Technical review on draft reporting finalised	2010-03-04
Final reporting finalised	2010-10-20
Technical review on final reporting finalised	2010-10-20
Final corrections	-

The main verification steps are described below.

2.1 Review of Project Documentation

The VCS PD ^{/PD/}, registered CDM PDD ^{/PDD/} and supporting background documents related to the project design and baseline were reviewed.

Furthermore, the verification team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data.

The references used in the course of this verification are summarized in section 5.

2.2 On-Site Assessment

2.2.1 Review of Performance Records

During the site visit below mentioned records were assessed:

1. Calibration – Enercon India Ltd has provided the certificates of the energy meters calibrated as per the registered PDD. However the details of the Calibration certificates are also mentioned in the Section 5 in table 5.1.
2. Gujarat Energy Development Agency (GEDA) – Permission of setting up the wind farm and Certificate for sharing the electricity generated by Wind farms at various location have been verified.
3. Gujarat Urja Vikas Nigam Limited (GUVNL) – Client has already entered in an agreement with GUVNL for selling the generated power and same was cross checked with the copy of agreement^{/PPA/} provided to the DOE.
4. Purchase order, civil & industrial work order, operation & maintenance work order have been cross checked and found to be satisfactory.
5. Land lease documents of GPEC Pvt Ltd was also assessed and found to be satisfactory.
6. Log sheet for the power generation at site.
7. Breakdown records.
8. Commissioning certificates.
9. Joint monitoring reports.

All the documents provided by the PP are thoroughly checked by the verification team and found appropriate.

2.2.2 Follow-up Interviews

The verification team has carried out interviews in order to assess the information included in the project documentation and to gain additional information regarding the compliance of the project with the relevant criteria applicable for the VCS.

During verification, the verification team has performed interviews to confirm selected information and to resolve issues identified in the document review. The main topics of the interviews are summarized in Table 2-2.

Table 2-2: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
Project proponent representatives Project consultant	- General aspects of the project - Technical equipment and operation - Changes since validation - Monitoring and measurement equipment - Remaining issues from validation / previous verifications - Calibration procedures - Quality management system - Involved personnel and responsibilities - Training and practice of the operational personnel - Implementation of the monitoring plan - Monitoring data management - Data uncertainty and residual risks - GHG calculation - Procedural aspects of the verification - Maintenance - Environmental aspects - Editorial issues of the Monitoring Report

A comprehensive list of all interviewed persons is part of section 5 'References', table 5-4.

2.2.3 Collection of Measurements

Meter at the pooling sub-station is installed by GETCO on 33/220 KV side. Tri vector meters are installed in the metering yards. At the end of the month, GEDA issues a share certificate^{/SC/} in respect of GPECL of active energy injection and reactive energy drawl of their WEGs. This statement (share certificate) will be the final measurement of the energy supplied to the GUVNL/DISCOM by the company for the preceding month for the purpose of payment.

The WEGs of a single customer (GPECL) at a particular site are connected to a metering yard which in turn connects to a feeder that ultimately leads to the main GETCO meter at the substation maintained by Enercon India Limited. Data monitoring takes place at the metering yard. The electricity metered at the GETCO meter is proportionally divided among the customers connected to the meter on the basis of the pro-rata readings taken at the metering yards.

The emission reduction calculations are done on the basis of the GETCO Main meter reading (net electricity exported to the grid) after deducting imports from the grid as mentioned in the share certificate^{/SC/} issued by GEDA on monthly basis.

Hence the emission reduction calculations is done on the basis of net electricity supplied to the grid as stated in the share certificate. This procedure of monitoring is fully complying to the monitoring plan as mentioned in the registered PDD^{/PDD/}.

2.2.4 Observation of established practices and testing of the accuracy of monitoring equipment

Accuracy of monitoring equipment in the project is maintained by means of periodic testing and other measures by the project proponent as specified in the QA/QC procedures given in approved monitoring plan of validated PDD^{/ CDM PDD/}. The established practices and testing of accuracy of the monitoring equipment was checked at the site by means of calibration certificates^{/CAL/}, training certificates of the O & M personnel provided to the verification team and other documentary evidences furnished by the project proponent on site, and were found to be appropriate and in compliance with the PDD.

2.3 Determination of the reductions in GHG emissions

Emission reductions have been transparently calculated as per the approach approved in the validated and registered PDD^{/CDM-PDD/}. The PP has used monitored data and ex ante fixed data including default values as permitted by the applied methodologies. The values used for calculation of GHG emission reductions have been thoroughly checked by the verification team and was found appropriate and correct. The emission reduction calculation spread sheet has been submitted by the PP, which clearly and transparently mentions value of each data parameter used for calculation of emission reduction. The calculations are traceable and follow logical steps. The input values have been verified from the reliable and authentic sources including monitoring records, share certificates/JMR provided by the GEDA, literature, Validated PDD, validation report and applied methodology i.e. ACM0002 version 08.

2.4 Review of additional data from other sources if appropriate

Additional data from other sources checked to cross verify the reliability of monitored data e.g. Central Electricity Authority (CEA) and IPCC. This is done through reviewing data sources and independent web search.

2.5 Review of monitoring results and verification of the correct application of monitoring methodologies

The verification team has carried out the on site visit and subsequent interviews in order to assess the information included in the project documentation/monitoring report and to gain additional information regarding the compliance of the project with the relevant criteria applicable for the VCS.

2.6 Resolution of any material discrepancy

Material discrepancies identified in the course of the verification are addressed either as CARs, CLs or FARs.

A **Corrective Action Request (CAR)** is established where:

- mistakes have been made in assumptions, application of the methodology or the project documentation which will have a direct influence the project results,
- the requirements deemed relevant for verification of the project with certain characteristics have not been met or
- there is a risk that the project would not be registered or that emission reductions would not be able to be verified and certified.

A **Clarification Request (CL)** will be issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

A **Forward Action Request (FAR)** will be issued when certain issues related to project implementation should be reviewed during the first verification.

A detailed list of the CARs CLs and FAR raised and discussed in the course of this verification is included in the next section 3 of this report.

3 VERIFICATION FINDINGS

In this section the assessments and findings from the desk review of the VCS PD, site visit, interviews and supporting documents as well as the final assessments are summarised. Table 3-1 includes an overview of all raised CARs, CLs and FARs.

Table 3-1: Overview of CARs, CLs and FARs issued

No.	Topic / Chapter	CAR	CL	FAR
3.1	Remaining issues, including any material discrepancy	-	-	-
3.2	Project implementation	01	-	-
3.3	Completeness of monitoring	04	01	-
3.4	Accuracy of emission reduction calculations	03	-	-
3.5	Quality of evidence to determine emission reductions	-	-	-
3.6	Management and operational system	-	-	-
-	SUM	08	01	0

3.1 Remaining issues, including any material discrepancy, from previous validation

Description

There are no remaining issues including material discrepancies from the earlier validation or determination stage of the project.

Related Findings

- ☒ No CARs, CLs or FARs have been identified in this context
- ☐ The following finding(s) have been addressed:

Final Assessment

There were no issues including material discrepancies and same has been cross checked from the validation report of the registered CDM PDD by the verification team. This is in compliance with VCS standard 2007.1.

3.2 Project implementation

Description

In the project activity the commissioning of WEGs took place over a period of 11 months. The first WEGs was commissioned on 12th April 2008 and the last WEGs was commissioned on 12th March 2009.

The project proponent intended to claim the credits from 12th April 2008 onwards which was accepted by the verification team. Also the sufficient data was evidenced through JMR/share certificates from April 2008 till the end of first monitoring period i.e. 12th February 2010.

The project has been implemented as described in the validated/registered CDM Project Design Document^{/PDD/}, however one CAR has been raised during the verification.

Related Findings

- ☐ No CARs, CLs or FARs have been identified in this context
- ☒ The following finding(s) have been addressed:

Finding:	3.2-1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The mentioned commissioning date of last WEGs on page 5th of MR and on page 29 of registered PDD is contradictory. Kindly rectify the same.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The last WEGs for the project activity were commissioned on 12th March 2009. The monitoring report has been revised to include the correct date.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Commissioning date of last WEGS in the revised MR has been correct and same was verified from the commissioning certificated by the verification team. The commissioning date is now consistent with PDD also. Hence CAR is closed.		

Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements
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Final Assessment

Commissioning certificates have been provided by the PP and checked thoroughly by the verification team. Verification team found the revised monitoring report^{/MR2/} clearly described the commissioning and the implementation of the project activity.

The only CAR raised on the inconsistency of the date of commissioning of last WEGs in monitoring report^{/MR1/} with the registered CDM PDD, which was successfully closed after verifying the revised monitoring report^{/MR2/} and original commissioning certificate.

3.3 Completeness of monitoring

Description

The monitoring report^{/MR1/MR2/} has outlined the monitoring of the project over the period (12th April 2008 to 12th February 2010). The submitted monitoring report^{/MR1/MR2/} which forms the basis of the verification was prepared by summarizing consolidated data over the whole monitoring period in accordance with the monitoring plan of the validated/registered CDM PDD/^{PDD/}.

Related Findings

☐ No CARs, CLs or FARs have been identified in this context

☒ The following finding(s) have been addressed:

Finding:	3.3-1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding	The monitoring report needs to incorporate the comparison of the actual ex-post emission reduction occurred in the		

	monitoring period with the ex-ante estimated emission reductions in the registered PDD.
Corrective Action #1	The emission reductions estimated in the registered PDD are 107,173 tCO₂ per annum. Since the current monitoring period covers a period of 1 year 10 months, emission reductions have been extrapolated for the current monitoring period, i.e. 12 April 2008 to 12 Feb 2010 (672 days). The emission reductions estimated in the registered PDD for this period works out to be $197,316 \text{ tCO}_2 \left(\frac{672}{365} \times 107,173 \right)$. The emission reductions actually achieved in the monitoring period are 118,494 tCO₂. Thus, it can be observed that the emission reductions for the current monitoring period have decreased as compared to the figure estimated in the registered PDD. This is because the registered PDD estimated emission reductions per annum assuming all the WEGs to be commissioned whereas in the current monitoring period, the WEGs were commissioned in a phased manner with the first WEGS being commissioned on 12th April 2008 and the last WEGS being commissioned on 12th March 2009. The same reasoning has been included in the revised monitoring report.
DOE Assessment #1	The revised monitoring report^{MR2/} is now incorporated with the comparison of the actual ex-post emission reduction occurred in the monitoring period with the ex-ante estimated emission reductions in the registered PDD. Explanation of comparison is found satisfactory by the verification team. CAR is closed.
Conclusion	☐ To be checked during the next periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding:	3.3-2		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	PP needs to further clarify whether the connected grid system is western regional grid in view of the fact that in India currently only two grid systems exist i.e. NEWNE and southern grid.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	At the time of web hosting of the CDM PDD for the project activity, it was envisaged that the project would be connected to the Western regional grid. However, the Western regional grid has now been synchronized with Northern, Eastern and North-Eastern regional grids and is now called the NEWNE grid. The same has been revised in the Monitoring Report.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Clarification on the name of the grid system is clearly explained by the PP and subsequently its correction is also made in the revised monitoring report ^{/MR2/} . CL is successfully closed.		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Finding:	3.3-3		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The GETCO third main meter serial no mentioned on page 15 of MR is GJB04170, which is not correct as found during site Visit. Correction for the same is required		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Serial number of the third GETCO main meter is GJB01470 and has been corrected in the revised Monitoring Report.		

DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The GETCO third main meter serial no is corrected in the revised monitoring report^{/MR2/} which is inline with the site visit evidences and also the calibration certificate of the same meter. CAR is closed.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding:	3.3-4		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	PP is requested to mention the number of WEGs associated with each meter installed at metering yard, along with the year of installation of meter in the metering yard.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The number of WEGs associated with each meter installed at metering yard along with its year of installation has been included in the revised Monitoring Report.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	No. of WEGs attached with the metering yard meter has now been clearly mentioned in the revised monitoring report^{/MR2/} and found correct by the verification team as per the site visit. Hence CAR is closed.		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Finding:	3.3-5		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	All headings/sections and tables in the Monitoring report need to be numbered and captioned.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	All tables in the revised Monitoring Report have been numbered and captioned.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	All the tables, headings/section have been properly numbered and captioned in the revised monitoring report ^{/MR2/} . Hence CAR is closed.		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Final Assessment

To be provided as part of the final verification reporting.

Revised monitoring report^{MR2/} has been assessed by the verification team and hence the CAR/CLs raised on the completeness of monitoring have been successfully closed

The monitoring report^{/MR2/} is in line with the requirements of the monitoring plan of the registered CDM PDD/^{PDD/} as well as with the applied methodology ACM0002 Version 8.0.

3.4 Accuracy of emission reduction calculations

Description

The monitoring report^{/MR1/MR2/} has been found to be in line with the registered CDM PDD/^{PDD/}, and also uses the same parameters.

The calculated emission reductions of 118,494 t CO₂e for the period between 12/04/2008 to 12/02/2010 has been verified and found to be true, real and accountable. Still three (03) CARs were raised on the same and closed successfully.

Related Findings

- ☐ No CARs, CLs or FARs have been identified in this context
- ☒ The following finding(s) have been addressed:

Finding:	3.4-1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	On page 11 of MR, PP needs to mention the exact figure of net electricity generation in kWh as mentioned in share certificate of GEDA.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The exact figure of net electricity generation (in kWh) as mentioned in share certificate of GEDA has been reported in the revised Monitoring Report.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Exact figure of net electricity generation i.e. 131,542,696 kWh for the entire monitoring period (12/04/2008 to 12/02/2010) as mentioned in share certificate of GEDA is now provided in the revised monitoring report ^{/MR2/} and found correct by the verification team.		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Finding:	3.4-2
Classification	☒ CAR ☐ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	A consolidated CAR is raised on the calibration details: - The calibrations dates mentioned in the MR for meters in metering yard are after the start date of monitoring period. PP needs to mention the calibration dates of meters in metering yard prior to monitoring period also. - In case of GETCO first and second bulk main meters as mentioned on page 14 of MR, the gap between consecutive calibrations are more than one year, which is not complying with the registered PDD. Pl. justify.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	- The dates of calibration carried out for meters installed in metering yard have been mentioned in the revised Monitoring Report. - The results of the delayed calibration of GETCO main meters show that the meters were operating well within the permissible limits of error. Thus, the meters can be assumed to be working within the permissible level of accuracy during the entire monitoring period before the delayed calibration as well. Further, as per the new Power Purchase Agreements being signed for wind power projects in Gujarat it is required to conduct the calibration of main meters only once in three years.

DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	• The calibrations dates for meters in metering yard are after the start date of monitoring period is now incorporated in the revised monitoring report^{/MR2/} and found to be correct by the verification team as verified by the calibration reports^{/CAL/}. • The calibration of the main GETCO meter is carried out by the electricity board (PGVCL) and the report for the same is submitted to the verification team. The report states that meter was found within the permissible range and hence meter was working properly. The same was also checked by the verification team during the on site verification. Although the calibration in some cases delayed, but the meters were working properly and within permissible limit of error (except for meter No. GJU04176 having calibration certificates dated 27.06.2007 and 03.03.2009 for which error observed were 0,288% and 0,345% respectively). The delay is justified by the section 7.2. § IV Of Article 7: Metering and Communication of Power Purchase Agreement^{/PPA/}. Emission reduction calculation Spreadsheet^{/XLS2/} and and revised Monitoring report^{/MR2/} were checked and found that PP has deducted maximum observed error of 0.345 % from export and added the same percentage in import for the period from April 2008 till 2nd March 2009 which is found to be appropriate and conservative. Hence, based on above, Verification team concludes that corrective action taken is in line with EB 52 Annex 60 for delay in calibration of energy meters. CAR 3. 4-2 is successfully closed..
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☒ Additional action should be taken ☒ The project complies with the requirements

Finding:	3.4-3
Classification	☒ CAR ☐ CL ☐ FAR
Description of finding Describe the finding in unambiguous style; address the context (e.g. section)	The emission reductions for the period of 26th Jan 2010 to 12th Feb 2010 are calculated on the basis of daily generation and share certificate provided by GEDA. PP needs to elaborate the calculation in MR and provide the justification for the appropriateness of the calculation procedure applied. Moreover PP needs to provide all the share certificates covering the whole verification period.
Corrective Action #1 This section shall be filled by the PP. It shall address the corrective action taken in details.	Calculations involving determination of net electricity exported by GPECL from 26th Jan 2010 to 12th Feb 2010 are iterated below: (a) The Net Electricity Generation by GPECL for the period from 26.01.10 to 26.02.10 (entire billing month) has been calculated by GEDA as 121,409 (GPEC – I) + 7,335,393 (GPEC – II) = 7,456,802 kWh. (b) The daily electricity generation recorded for the period from 26.01.10 to 12.02.10 (period under consideration) for the 63 WEGs was 3,605,276 kWh. (c) The daily electricity generation recorded for the period from 26.01.10 to 26.02.10 (entire billing month) for the 63 WEGs was 3,605,276 (26.01.10 to 12.02.10) + 4,026,033 (13.02.10 to 26.02.10) = 7,631,309 kWh The value obtained in step (a) is multiplied by the ratio (b)/(c) to obtain the net electricity exported by the 63 WEGs of GPECL from 26.01.10 to 12.02.10 (period under consideration) i.e. 3,523 MWh $\left(7,456,802 \times \frac{3,605,276}{7,631,309} \right)$ The same has been included in the revised monitoring report.

DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The emission reductions for the period of 26th Jan 2010 to 12th Feb 2010 are calculated on the basis of daily generation and share certificate provided by GEDA(pro-rating the share certificate value) The PP has calculated the emission reduction till the 12th February 2010 while the share certificate issued by the GEDA gives the real net export value for the entire month of February. For this PP pro-rated the Share certificate generation value with due consideration of SCADA daily reading for the month of February for the calculation of emission reduction till 12/02/2010. Since the net export is appropriated for the particular period, hence it also accounts of transmission losses, and thus considered appropriate. The same is now described in the revised monitoring report^{/MR2/} which was supported with calculation spreadsheet. The pro-rata calculation, share certificates along with the SCADA reading for the specified period was thoroughly checked and cross checked by the verification team and found accurate and appropriate. Further it is hereby clarified that PP intended to claim VERs only till 12th February 2010 simply because the same project activity got registered under CDM (Ref No. 2925,) on date: 13/02/2010. Hence CAR is closed.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Final Assessment

Findings raised on the overall emission reduction calculation by GPECL were successfully closed due to corrective actions taken and clarification made by the PP.

The net electricity generated by the project during the monitoring period (12/04/2008 to 12/02/2010) is 131,542,696 which lead to net emission reductions of 118,494 t CO₂.

Monthly share certificates of net electricity supplied to the grid by the project activity, covering the entire monitoring period (2008-04-12 to 2010-02-12) has been checked and found to be correct. The daily reading for the last month of the current monitoring period is also verified by the verification team through generation log sheet.

The net emission reduction calculated based on the share certificate released by the GEDA for the entire verification period and found to be correct by the verification team.

Furthermore the emission reductions for the period of 26th Jan 2010 to 12th Feb 2010 are calculated on the basis of daily generation^{/log/} and pro-rating the share certificate value provided by GEDA (pro-rating the JMR/Share certificate value), which was found to be satisfactory by the verification team.

3.5 Quality of evidence to determine emission reductions

Description: All the share certificates and calibration reports are checked. During site visit verification team has also checked the daily readings from SCADA to crosscheck the share certificates. All the meters were found working properly.

Related Findings

- ☒ No CARs, CLs or FARs have been identified in this context
- ☐ The following finding(s) have been addressed:

Final Assessment

The Share certificate released by GEDA is an authentic source for emission reduction calculation and also the periodic calibration/test certificates for the entire monitoring period were submitted to the verification team and found satisfactory.

☐ ...

3.6 Management and operational system

Description

The suitability of the monitoring system was assessed first during the desk review, followed by site visit and the interviews. The management and operation of the project has been found to be sufficient as per the monitoring plan of the registered CDM PDD^{/PDD/}. The system in place on site has been found to be satisfactory as it ensures that the quality of the emission reductions achieved by the project is

maintained and is in accordance to the registered PDD.

Related Findings

- ☒ No CARs, CLs or FARs have been identified in this context
- ☐ The following finding(s) have been addressed:

Final Assessment

The management and operation system found was in line with quality required to generate emission reductions and same has been cross checked in three steps
1.Document desk review, 2 Site visits 3. Interviews by the verification team

4 VERIFICATION STATEMENT

The verification statement will be provided as part of the final verification report.

Gujarat Paguthan Energy Corporation Private Limited (GPECL) has commissioned the TÜV NORD JI / CDM Certification Program to carry out the verification of the Project “Wind based renewable energy project in Gujarat” in the Jamnagar district of Gujarat, India with regard to the requirements of VCS 2007.1 Standard.

The project activity involves an initiative by GPECL to export renewable electricity produced by Wind Electric Generators (WEGs) to the power deficit NEWNE regional grid in order to decrease power shortage, diversify the grid and reduce greenhouse gas emissions.

The wind power generated from the project is displacing the electricity generated from fossil fuel intensive thermal power plants feeding into NEWNE grid.

Reporting period: From 12-04-2008 to 12-02-2010

In the course of the verification (08) Corrective Action Requests (CARs), (01) Clarification Requests (CLs) were raised and successfully closed.

The verification is based on the draft monitoring report, revised monitoring report, monitoring plan as set out in the registered CDM PDD, the validation report, emission reduction calculation spreadsheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

In detail the conclusions can be summarised as follows:

- all operations of the project are implemented and installed as planned and described in the validated project design document (PDD)^{/CDM PDD/}.

The monitoring plan is in accordance with the applied approved methodology, i.e., Consolidated baseline methodology for grid-connected electricity generation from renewable sources i.e. ACM0002, version 08”.

- the installed equipment essential for measuring parameters required for calculating emission reductions is calibrated appropriately.
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of the verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Period	Emission Reduction t CO2 eq
12 April 2008 to December 2008	19,483
January 2009 to December 2009	88,002
January 2010 to 12 February 2010	11,009
Total Emission reductions	118,494

Baseline emissions 118,494t CO2 equivalents

Emission reductions 118,494t CO2 equivalents

New Delhi, 2010-10-20

A handwritten signature in black ink, appearing to read 'Archak Pattanaik', written over a horizontal line.

TÜV NORD JI/CDM Certification
Program

Mr. Archak Pattanaik

Verification Team Leader

Essen, 2010-10-20

A handwritten signature in black ink, appearing to read 'Rainer Winter', written in a cursive style.

TÜV NORD JI/CDM Certification
Program

Mr. Rainer Winter

Final Approval

5 REFERENCES

Table 5-1: Documents provided by the project participant

Reference	Document
/CAL/	Calibration records for the key instruments and measuring devices: • Calibration certificate of GETCO bulk main meter S. No. GJU04175 covering whole verification period dated: 04.02.2008, 03.03.2009. • Calibration certificate of GETCO bulk main meter S. No. GJU04176 covering whole verification period dated: 27.06.2007, 03.03.2009. • Calibration certificate of GETCO bulk main meter S. No. GJB01470 covering whole verification period dated: 10.04.2008, 03.03.2009. • Calibration certificate of meter S. No. GJB01567 installed at metering yard covering whole verification period dated: 28.02.2008 and 12.10.2009 • Calibration certificate of meter S. No. GJB01561 installed at metering yard covering whole verification period dated: 28.02.2008 and 26.08.2009 • Calibration certificate of meter S. No. GJB01560 installed at metering yard covering whole verification period dated: 28.02.2008 and 26.08.2009 • Calibration certificate of meter S. No. GJB01562 installed at metering yard covering whole verification period dated: 28.02.2008 and 12.10.2009 • Calibration certificate of meter S. No. GJB01565 installed at metering yard covering whole verification period dated: 28.02.2008 and 12.10.2009 • Calibration certificate of meter S. No. GJB01740 installed at metering yard covering whole verification period dated: 19.08.2008 . • Calibration certificate of meter S. No. 07025779 installed at metering yard covering whole verification period dated: 17.05.2008 and 26.08.2009 • Calibration certificate of meter S. No. GJB01726 installed at metering yard covering whole verification period dated: 11.06.2008 and 26.08.2009 • Calibration certificate of meter S. No. GJB01600 installed at metering yard covering whole verification period dated: 19.05.2008 and 12.10.2009
/CCI/	• Commissioning certificates for the 10 WECS dated 15 September 2008 • Commissioning certificates for the 05 WECS dated 23 January 2008 • Commissioning certificates for the 05 WECS dated 7th October 2008 • Commissioning certificates for the 02 WECS dated 16th July 2008. • Commissioning certificates for the 08 WECS dated 19th June 2008

Reference	Document
	- Commissioning certificates for the 06 WEGS dated 6th June 2008 - Commissioning certificates for the 01 WEGS dated 17th 2008 - Commissioning certificates for the 03 WEGS dated 15th December 2008 - Commissioning certificates for the 04 WEGS dated 30th December 2008. - Commissioning certificates for the 02 WEGS dated 30th December 2008. - Commissioning certificates for the 06 WEGS dated 17th February 2009. - Commissioning certificates for the 01 WEG dated 20th March 2009.
/CON/	The signed contract between TUV-NORD and GPECL to carry out the validation and verification job dated 03/03/2010.
/SC/	Monthly share certificates for whole the monitoring period 2008-04-12 -2010-02-12
/LOG/	Extract of log of monitored data of the project activity: - Log sheets for the breakdown details. - Log of the metres associated with project activity. - Log of the GETCO bulk main meter
/ORG/	Organisation Chart for operation and monitoring for the proposed project activity.
/MR1/	Draft MR version 01 which forms the basis for draft verification report dated 26/02/2010.
/MR2/	Revised MR version 02 which forms the basis for verification report dated 01/04/2010
/PHOTO/	Photograph of the WEGS installed at project site.
/PPA/	- Power purchase agreement between gpecl and dgvl dated 2008-09-24. - Wind Energy Purchase Agreement between GPEC and Torrent Power Limited (TPL) dated 14th October 2008 for 49.6 MW
/PMS/	Preventive maintenance schedule
/QA-QC/	The QA-QC procedure on data acquisition and storage.
/TR/	Training and maintenance record of the plant personnel associated with the project activity.

Reference	Document
/XLS1/	Supporting Excel sheets for calculation of emission reduction related to MR1 dated 26/02/2010.
/XLS2/	Supporting Excel sheets for calculation of emission reductions associated with MR2 dated 01/04/2010.

Table 5-2: Background investigation and assessment documents

Reference	Document
/ACM 0002/	Grid connected electricity generation from renewable sources : ACM 0002 (version 08)
/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/IPPC/	1996 IPCC GUIDELINES FOR NATIONAL GREENHOUSE GAS INVENTORIES: WORK BOOK 2006 IPCC GUIDELINES FOR NATIONAL GREENHOUSE GAS INVENTORIES: WORK BOOK
/ISO 14064/	Greenhouse gases -- Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals Greenhouse gases -- Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements Greenhouse gases -- Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions
/ISO14065/	Greenhouse gases - Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition
VCS	Voluntary Carbon Standard 2007.1
/VDS-PD-T/	VCS PD Template
/VVM/	Validation and Verification Manual (Version as per EB 51)

Table 5-3: Websites used

Reference	Link	Organisation
/cd4cdm/	www.cd4cdm.org	UNEP Riso Centre
/ipcc/	www.ipcc-nggip.iges.or.jp	IPCC publications
/vcs/	www.v-c-s.org	VCSA
/unfccc/	http://cdm.unfccc.int	UNFCCC
/wpi/	www.windpowerindia.com	Wind Power India

Table 5-4: List of interviewed persons

Reference	Mol1		Name	Organisation / Function
/IM01/	V	☒ Mr. ☐ Ms.	Satish Vayachal	Manager-Renewables GPEC Pvt. Ltd.
/IM01/	V	☒ Mr. ☐ Ms.	Kantilala Baria	Senior Manager-Service, Enercon India Limited.
/IM01/	V	☒ Mr. ☐ Ms.	P. Sajil	Sr. Eng., Enercon India Limited.
/IM01/	V	☒ Mr. ☐ Ms.	Kiran Sule	Engineer Enercon India Limited
/IM01/	V	☒ Mr. ☐ Ms.	Ishan Parikh	Site In charge, Enercon India Limited
/IM02/	V	☒ Mr. ☐ Ms.	Atin Prakash	Ernst & Young/ Consultant

¹⁾ Means of Interview: (Telephone, E-Mail, Visit)