VCS VERIFICATION REPORT

GREEN ENERGY PROJECT AT KUTCH BY POWERICA LIMITED

Lloyd's Register Quality Assurance Limited

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Summary:

Lloyd's Register Quality Assurance Limited (LRQA) has been contracted by Powerica Limited, the project participant, to carry out the verification of the project - "Green Energy Project at Kutch by Powerica Limited", with regard to the relevant requirements of VCS programme guidelines and standard (VCS standard version 3.4 & VCS program guide version 3.5). The project is registered as CDM project activity (UNFCCC Reference number 7671). This verification involves the pre-CDM registration period of 14/07/2011 to 21/10/2012 (including both the days).

The project activity involves the installation of 12 WTGs of 1.8 MW each aggregating to 21.6 MW as the total installed capacity. The generated electricity by the project activity is supplied to the Gujarat Energy Transmission Corporation Limited (GETCO) which is a part of the integrated NEWNE grid in India. The primary aim of the project activity is to harness the wind energy for generation of renewable electricity and exporting electricity to the GETCO, thereby displacing equivalent amount of electricity of the integrated NEWNE electricity grid of India which is predominantly from fossil fuel based power plants.

The purpose of the verification is to review the monitoring results and verify that monitoring methodology was implemented according to monitoring plan and monitoring data, used to confirm the reductions in anthropogenic emissions by sources is sufficient, definitive and presented in a concise and transparent manner. In particular, monitoring plan, monitoring report and the project's compliance with relevant VCS, UNFCCC and host Party criteria are verified in order to confirm that the project has been implemented in accordance with previously registered design and conservative assumptions, as documented.

The methodology **ACM 0002, version 12.3.0**: "*Consolidated baseline methodology for grid-connected electricity generation from renewable sources*", an approved methodology of UNFCCC CDM program is applied.

A risk based approach has been followed to perform this verification. In the course of the verification 01 Corrective Action Requests (CARs) and 05 Clarification Requests (CLs) were raised. No Forward Action Request was raised. The CARs and CLs were successfully closed.

The verification comprises a review of the monitoring report over the monitoring period from 14/07/2011 to 21/10/2012 (inclusive of both the days) based on CDM registered PDD (reference project number 7671), in part of the monitoring parameters and monitoring plan, emission reduction calculation spreadsheet, monitoring methodology and all related evidence provided by project proponent.

On-site visit and stakeholders interviews were also performed on 10/01/2014 as part of the verification process.

This verification is also carried out along with supplementary validation on VCS-PD.

The year wise GHG emission reductions by the project activity in the reported monitoring period 14/07/2011 to 21/10/2012 (inclusive of both the days) are as below:

Year	**Emission reductions in the reported monitoring period in tCO_2e**
2011 (14/07/2011 to 31/12/2011)	5,443
2012 (01/01/2012 to 21/10/2012)	47,788
Total	**53,231**

As emission reductions occur prior to the registration of the project as CDM project activity, these emission reductions cannot be claimed as Certified Emission Reductions (CERs). The emission reductions are thus claimed as Verified Carbon Units (VCUs) under the VCS. This is in accordance to the present VCS Guidance for projects that are registered in two GHG programs.

In LRQA's opinion, the emission reductions reported for the "Green Energy Project at Kutch by Powerica Limited" in the monitoring report are fairly and correctly stated. LRQA is therefore able to certify that the emission reductions from the "Green Energy Project at Kutch by Powerica Limited" during the period from 14/07/2011 to 21/10/2012, amount to 53,231 tCO_2e.

LRQA does not assume any responsibility towards the issuance and utilisation of VCUs hereby verified and certified. Request for issuance of VCUs shall be made by the project proponent to an approved VCS Program Registry based on the requirements set out under the most recent version of the VCS Program Guidelines clause on VCS Registration. The verification of reported emission reductions is based on the information made available to LRQA and the engagement conditions detailed in this report. Hence, LRQA cannot be held liable by any party for decisions made or not made based on this report.

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1 INTRODUCTION

1.1 Objective

Lloyd's Register Quality Assurance Limited has been contracted by Powerica Limited , the project participants (PP), to undertake the verification of the project titled "Green Energy Project at Kutch by Powerica Limited" for the pre-CDM registration period of 14/07/2011 to 21/10/2012 (including both the days).Through the verification activities, it is being confirmed that:

- the project is implemented as described in the CDM registered Project Design Document;
- the monitoring system is implemented and fully functional to generate Verified Carbon Units (VCUs) without any double counting, and
- the data reported are accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emissions reductions calculation.

The verification followed the requirements of the current version of the VCS Standard Version 3.4 and VCS program guide 3.5 to ensure the quality and consistency of the verification work and the report.

1.2 Scope and Criteria

The scope of verification was an independent and objective review of the monitored emission reductions (ERs) against the verification requirements of the VCS. LRQA followed a risk-based approach in the verification, focusing on the identification of significant risks for implementation of the registered monitoring plan and the resultant emission reductions. The verification statement shall become final after final review by the decision maker of LRQA Ltd.

The criteria of the verification are:

- VCS Program Guide version 3.5
- VCS Standard version 3.4 and other relevant requirements defined by VCSA.
- The approved methodology ACM 0002, version 12.3.0: "*Consolidated baseline methodology for grid-connected electricity generation from renewable sources*", an approved methodology of UNFCCC CDM program is applied.

The verification has ensured that reported emission reductions are complete and accurate.

1.3 Level of Assurance

The verification report is based on VCS PD, monitoring report, registered CDM-PDD, supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment.

The verification has been planned and organised to achieve a

☒ Reasonable level of assurance with 5% materiality as per VCS standard 3.4.

☐ Limited level of assurance

1.4 Summary Description of the Project

The project activity involves installation of twelve numbers of WTGs having installed /rated capacity of 1.8 MW each. The aggregate installed capacity of the project activity is 21.6 MW. The WTGs are located in the Kutch district of Gujarat state in India. All the twelve WTGs are of Vestas make. Commissioning dates of twelve WTGs of the project activity were in between 14/07/2011 to 31/12/2011 as stated in section 2.1 of the MR. Hence the VCS start date is considered as the earliest among these dates, i.e. 14/07/2011. These dates have been verified from the commissioning certificates issued by Gujarat Energy Development Agency (GEDA).

*Section 4.1.5 (a) (i) of VCS procedural document "Registration and Issuance Process: VCS Version 3", dated 8 October 2013, v3.5, states "*The other GHG program validation (or verification, where the approved GHG program does not have a validation step) or VCS validation shall be completed within two years of the project start date*".* The CDM validation report date for this project activity, as per UNFCCC project page is 24/09/2012 which can be treated as validation completion date and is within the two years of project start date i.e. 14/07/2011. Hence the project activity complies with the above referred VCSA requirement. Furthermore, under VCS, the PP is claiming emission reductions for the period from 14/07/2011 to 21/10/2012 and the first renewable CDM crediting period is from 22/10/2012 to 21/10/2019. Hence there is no overlap for claim of emission reductions in between VCS program and the other GHG program, i.e. CDM.

The project activity has been implemented as described in the registered CDM-PDD, in particular, Sections A.2, A.4.2 and B.7 of the CDM PDD. As per paragraph 3.11.1 of "VCS Standard: VCS Version 3", dated 8 October 2013, v3.4, the requirements with respect to evidencing proof of "Right of Use" the validated documents, i.e. PPA, is matching with the evidencing proof for Right of Use "a right of use arising or granted under statute, regulation or decree by a competent authority" i.e. the right of PP to use the emission reductions arising due to this project activity provided by the PPA signed with Gujarat Urja Vikas Nigam Limited (GUVNL).

During the reported monitoring period 14/07/2011 to 21/10/2012 (including both days), the project activity supplied 56,116 MWh of net electricity to the integrated NEWNE grid, which forms the basis of emission reductions calculation. The validated ex-ante grid emission factor value 0.9486tCO_2/MWh for NEWNE grid is applied for the calculation of baseline emissions and emission reductions for this monitoring period. The applied approved CDM methodology is ACM 0002, version 12.3. The baseline emissions and thus emission reductions during this monitoring period are 53,231 tCO_2e.

The net electricity supplied to the grid is calculated through a two way measured procedure. First measurement of electricity exported/imported is done at the individual WTG yard meters, and second measurement is done at the sub-station meters of the wind farm. Net electricity exported/imported from the project activity is measured by apportioning of losses from the WTG to the substation. This apportioning procedure is also in accordance with the PPA. The verification team also confirmed that apportioning procedures as mentioned in the monitoring plan of the registered PDD has been correctly applied.

2 VERIFICATION PROCESS

2.1 Method and Criteria

The verification consists of the following phases:

1. Desk review of the monitoring plan, monitoring report, CDM-PDD and other relevant documents;

2. On-site visit (including follow-up interviews with project stakeholders) and issuance of draft verification report / findings log;

3. Resolution of outstanding issues and the issuance of the final Verification report and Certification Statement.

2.2 Document Review

During the document review, LRQA has applied standard auditing techniques to assess the quality of information provided. The verification was performed primarily based on the review of the monitoring report and the supporting documentation. This process included:

- a review of data and information presented by the PP to verify their completeness
- a review of the MP and monitoring methodology, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the QA/QC procedures, and
- an evaluation of data management and the QA/QC system in the context of their influence on the generation and reporting of ERs.

The monitoring report version 1.0 dated 20/11/2013 was initially reviewed and LRQA requested the PP to present the supporting information and documents and such additional information and documents that were also reviewed by LRQA. The documents reviewed by LRQA are listed below. Through the process of the verification, the revised monitoring report and the supporting documents were evaluated to confirm the actions taken by the PP to the

CARs and CLs issued by LRQA. LRQA reviewed the final version of the monitoring report (version 3.1 dated 17/02/2014) to confirm that all changes agreed had been incorporated.

The following table outlines the documentation reviewed during the verification:

Category A documents (documents from the PP)

1	Monitoring Report version 1.0 dated 20/11/2013, version 2.0 dated 13/01/2014, version 3.0 dated 10/02/2014, version 3.1, dated 17/02/2014
2	Emission reductions calculation spread sheet version 1.0 dated 20/11/2013, version 2 dated 13/01/2014
3	Commissioning certificates dated 25/07/2011 and 03/03/2012 issued by GEDA as a proof for the commissioning of the 12 WTGs of the project activity from 14/07/2011 to 31/12/2011. The commissioning certificate for 14/07/2011 is considered as the evidence for start date of the project activity
4	Copy for the declaration from PP for the statement "…*not sought or received another form of GHG-related environmental credit, including renewable energy certificates. The project is neither rejected under any other GHG-related environmental credit and the related program*" as stated in section 1.12.3 of the VCS PD.
5	Invoices for sale of electricity for the period covering the monitoring period from 14/07/2011 to 21/10/2012
6	Certificates for share of electricity generated by wind farm at Vandhiya sub-station for the monitoring period
7	LCS meter readings for the month of October 2012
8	Calibration certificates for the energy meters installed at the WTG sites at Electrical yards covering the monitoring period
9	Calibration certificates of the energy meters at Vandhiya sub-station covering the monitoring period
10	Copy of supply agreement for twelve numbers of Vestas 1800 kW Wind turbine generators dated 31st March 2011 including the technical specification of the WTGs
11	Power Purchase agreements with GUVNL, dated 24/06/2011 and 12/09/2011; PPA is also considered as evidence for Right of Use
12	Single line diagram showing the electricity generation, transmission, evacuation and metering system.
13	Proof of training and competency of the project operators
14	Copy of annual maintenance contract with Vestas dated 31/03/2011
15	Initial inspection certificates issued by the office of chief electrical inspector dated: 14/06/2011 and 05/09/2011
16	VCS Project Description (VCS PD) for completed clauses 1.2, 1.3, 1.5, 1.6, 1.7, 1.9, 1.10, 1.12.1, 1.12.2, 1.12.3, 1.12.4 and 1.13, version 01 dated 20/11/2013 and version 02 dated 13/01/2014

Category B documents (other documents referenced)

1	Registered project design document (PDD) for CDM project, version 06 dated: 02/09/2012 for the project activity
2	Validation report for CDM project (Ref: CDM-MUM-0061787), version 04.2, dated: 24/09/2012 for the project activity
3	Approved CDM monitoring methodology ACM 0002, version 12.3, "*Consolidated baseline methodology for grid-connected electricity generation from renewable sources*"
4	VCS Version 3; Program Guidelines; VCSA Rules; and VCS Guidance Document issued on 08/10/2013
5	CDM Validation and Verification Standard, version 05.0
6	Project page on UNFCCC web site for the project activity: http://cdm.unfccc.int/Projects/DB/LRQA%20Ltd1349877556.69/view

2.3 Interviews

The detail of the on-site assessment is as follows:

Date	Location	Team Members on site	Subjects covered	Persons interviewed
10/01/2014	Project site and Vandhiya sub-station	Sanjay Kumar Agarwalla	• Project implementation and management • Site tour • Confirmation of technical specifications of the project WTGs • Data management and reporting systems • Data verification • QA/QC, management systems, calibration, training • Data archiving Environmental and social issues	1. Saroj Sahoo, Manager, Powerica Ltd. 2. Jignesh V, Regional Manager, Vestas 3. Jitesh Visaradia, Sr. Manager, Powerica Ltd. 4. Raj Kumar, Engineer, Vandhiya Sub-station, Vestas. 5. Edewin, Sr. Engineer – Customer Service, Vestas

2.4 Site Inspections

LRQA has conducted on-site inspection in order to confirm all physical features of the project activity proposed in the registered CDM PDD are in place and that the project proponent has operated and correctly monitored all parameters of the project activity as per the registered CDM PDD during this monitoring period.

An on-site assessment was conducted on 10/01/2014 as a part of verification activity which involved:

1) an assessment of the implementation and operation of the project activity as per the registered CDM PDD
2) a review of information flows for generating, aggregating and reporting of the monitoring parameters
3) interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the MP

4) a cross-check between information provided in the MR and data from other sources

5) a check of the monitoring equipment including calibration performance, and observations of monitoring practices against the requirements of the CDM PDD and the applied monitoring methodology

6) A review of calculations and assumptions made in determining the GHG data and ERs, and

7) An identification of QA/QC procedures in place to prevent, or identify and correct, any errors or omissions in the reported monitoring parameters.

2.5 Resolution of Findings

LRQA, during this verification, identified issues related to the monitoring, implementation or operation of the VCS project that could impair the capacity of the proposed VCS project to achieve emission reductions or influence the reporting of emission reductions. LRQA has identified, discussed and concluded these issues within the Verification report in Appendix B.

- Clarification requests (CLs): Project reporting lacks transparency and further information is needed to determine if a material discrepancy is present.
- Corrective action requests (CARs): The VVB has identified a material discrepancy or non-conformance that the project proponent must address.

The verification team identified one (1) CAR and five (5) CLs. All CARs and CL raised by LRQA during this verification have been resolved. If this was not completed, the ERs cannot be certified and recommended for issuance to the VCS Registry.

2.5.1 Forward Action Requests

Forward Action Request (FAR) is to be raised when the monitoring and reporting require attention and / or adjustment for the next verification period. FARs does not relate to VCS requirements for issuance of ERs achieved during the subject monitoring.

LRQA has not raised any FAR during this verification.

2.6 Eligibility for Validation Activities

The project activity falls under sectoral scope 1 and the LRQA is accredited for validation / verification of project activities under this scope.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

This is a registered CDM project activity by UNFCCC (Reference number 7671) validated by the DOE “LRQA”. The validation report was issued on 24/09/2012 and the project was registered by UNFCCC on 22/10/2012.

UNFCCC Clean Development Mechanism is approved by VCS Program and meets VCS criteria. As the project has been validated under CDM, validation of only the clauses 1.2, 1.3, 1.5, 1.6, 1.7, 1.9, 1.10, 1.12.1, 1.12.2, 1.12.3, 1.12.4 and 1.13 of the VCS PD as per VCS Version 3 were carried out as below:

1.2: Sectoral Scope and Project Type

According to the VCS version 3.3 Guidelines and the list of Sectoral Scopes of the UNFCCC, the project is applicable under the following activity categories:

According to Annex A of the Kyoto Protocol, the project is applicable under the sectoral scope 1
- Energy Industries (renewable/ non-renewable sources).

1.3: Project Proponent

Powerica Limited is the Project Proponent for the project activity

1.5: Project Start Date

The start date of the project activity is 14/07/2011 as verified from the commissioning certificates. The earliest commissioning date of the project wind turbines has been considered as start date for the project activity.

1.6: Project Crediting Period

The first renewable CDM crediting period of the project activity is 22/10/ 2012 to 21/10/2019. The VCS crediting period is therefore from 14/07/ 2011 to 21/10 2012.

1.7: Project Scale and Estimated GHG Emission Reductions or Removals

Project Scale	
Project	√
Large project	

1.9: Project Location

The project is located in Kutch district of Gujarat state in India.

The geographic coordinates of each WTGs were verified from the registered CDM PDD and also cross checked during the on-site visit which is as follows:

WTG	Village	District and State	Latitude (^{0}N)	Longitude (^{0}E)
VW 21	Vandhiya	Kutch, Gujarat	23^0 12’ 20”	70^0 37’ 30”
VW 32	Vandhiya	Kutch, Gujarat	23^0 12’ 12”	70^0 37’ 12”
NM82-4	Vandhiya	Kutch, Gujarat	23^0 12’ 5”	70^0 35’ 19”
JW 27	Jangi	Kutch, Gujarat	23^0 12’ 49”	70^0 33’ 35”
NM 82-3	Vandhiya	Kutch, Gujarat	23^0 11’ 53”	70^0 35’ 26”
JW 30 New	Jangi	Kutch, Gujarat	23^0 11’ 59”	70^0 31’ 55”

WTG	Village	District and State	Latitude (^{0}N)	Longitude (^{0}E)
NM 82 07	Vandhiya	Kutch, Gujarat	23^0 11' 53"	70^0 35' 58"
JW 09	Jangi	Kutch, Gujarat	23^0 12' 3"	70^0 33' 2"
JW 10	Jangi	Kutch, Gujarat	23^0 11' 56"	70^0 32' 48"
JW 12	Jangi	Kutch, Gujarat	23^0 12' 29"	70^0 32' 13"
JW 13	Jangi	Kutch, Gujarat	23^0 12' 12"	70^0 32' 16"
NM 82 06	Vandhiya	Kutch, Gujarat	23^0 11' 59"	70^0 35' 47"

1.10: Conditions Prior to Project Initiation

The project activity involves installation of 21.6 MW wind electricity project and supply of the generated electricity to the NEWNE grid. Hence prior to the implementation of the project activity, the equivalent amount of electricity was generated in the grid which is majorly fossil fuel based.

1.12.1: Right of Use

Evidence of Right of Use has been demonstrated by the right of PP to use the emission reductions arising due to this project activity provided by the PPA signed with Gujarat Urja Vikas Nigam Limited (GUVNL).

1.12.2: Emissions Trading Programs and Other Binding Limits

This is not applicable as the project is registered by UNFCCC Registration Reference number – 7671 and is approved by the Indian DNA.

1.12.3: Other Forms of Environmental Credit

The project is located in India and is developed and operated by Powerica Limited. There is no other environmental credit (for example renewable energy certificate) which has or will be produced by or obtained for the project. A self-declaration letter from project proponent addressing that the project does not yield any green benefits / renewable energy certificates and has not claimed emission reductions under any other GHG program for the verification period (14/07/2011 to 21/10/ 2012) has been provided.

1.12.4: Participation under Other GHG Programs

The project has been registered as a CDM project, and it does not fall into rejected projects under any other GHG programs. The reference number of the project with UNFCCC is 7671.

1.13: Additional Information Relevant to the Project

No such additional requirement is relevant to the project that needs to be provided and verified by LRQA.

Hence the project activity meets the criteria of the clauses 1.2, 1.3, 1.5, 1.6, 1.7, 1.9, 1.10, 1.12.1, 1.12.2, 1.12.3, 1.12.4 and 1.13 of the VCS PD as per VCS Version 3 and is likely to achieve the estimated emission reductions.

3.2 Methodology Deviations

No methodology deviation is applied to this project activity.

3.3 Project Description Deviations

There is no deviation from the project description as stated in the CDM registered PDD for the project activity.

3.4 Grouped Project

This is not a group project hence this section is not applicable.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activity, “Green Energy Project at Kutch by Powerica Limited” was registered as a CDM project on 22/10/2012 (UNFCCC Ref No.7671) applying the methodology ACM 0002, version 12.3, “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”. The WTGs of the project activity are owned by the Project Proponent, i.e. Powerica Limited, which was verified from commissioning certificate and the PPA for the project activity.

The project activity involves an installation of 12 Wind Turbine Generators (WTGs) of total generating capacity of 21.6 MW (12×1.8MW) of Vestas make. The WTG units are installed in Kutch district in the state of Gujarat and the electricity generated is exported to NEWNE grid of India.

Verification team confirmed from the registered CDM PDD and on-site visit that the location of the project activity including the coordinates is same as mentioned in the registered PDD.

The project boundary includes the electricity generation equipment at the site and Vandhiya sub-station and the NEWNE grid.

The ex-ante fixed grid emission factor of 0.9486tCO_2/MWh has been used for the baseline emission calculation which is line with the registered CDM PDD.

Comparison of monitored data in MR and in the registered CDM PDD is as follows:

Sr. No.	Parameter	Symbol	Value in PDD	Actual value as in MR for the Monitoring period
1.	Quantity of net electricity generation supplied by the project plan/unit to the grid	$EG_{facility,y}$	56,000 MWh/year (this corresponds to 71,342 MWh for the monitoring period from 14/07/2011 to 21/10/2012)	56,116 MWh
2.	Emission reductions	tCO_2e	53,122 tCO_2e / annum (this corresponds to 67,675 tCO_2e for the monitoring period from 14/07/2011 to 21/10/2012)	53,231 tCO_2e

The net electricity supplied to the grid during the monitoring period is less, and resulted in lower emission reductions.

No change from the registered CDM PDD of physical features which may impact the emission reductions of the project activity has been identified. The verification team confirms all the physical features of the CDM project activity in the registered PDD are in place.

The monitoring plan in the registered CDM PDD requires monitoring of the net energy exported to the grid. The value of the monitoring parameter is indicated appropriately in the section 3.2 of the Monitoring report as per the registered PDD. The verification team confirms that the data were generated at the required frequency as per the monitoring plan in the registered PDD.

The metering arrangement was confirmed during the on-site visit which include WTG yard meters located at the 33 kV line for each of the twelve WTGs and the substation meters located at Vandhiya (220 kV) substation for the electricity supplied by the whole wind farm.

It was confirmed that the information of the meters were consistent with that described in the MR through physical observation and document review.

The net electricity supplied to the grid is calculated through a two way measured procedure. First measurement of electricity exported/imported is done at the individual WTG yard meters, and second measurement is done at the substation meters of the wind farm. These meters were used to measure the electricity export and import on continuous basis and are in custody of MSEDCL. The main meter reading is considered for the calculation net electricity supplied to the grid. The check meter is also installed for purpose of any fault in main meter or any other technical failure. The check meter reading is considered in case of any failure of main meter. During this monitoring period no incidence of main meter failure was found[1]. Net electricity exported/imported

[1] The check meter readings were monitored during the monitoring period and data maiatanied by PP, This was confirmed during the onsite assement. However, considering there was no incidence of failure of the main meter, check meter readings were not required to be reported and hence the main meter readings were considered for ER calculation during the monitoring period. This is in line with the PPA and the registered CDM PDD.

from the project activity is measured by apportioning of losses from the WTG to the substation. This apportioning procedure is also in accordance with the PPA. The verification team during the on-site visit interview with the O&M personnel of Vestas also confirmed that apportioning procedures as mentioned in the monitoring plan of the registered PDD has been correctly applied.

The certificate for share is the basis on which project promoter raises invoice to the State Utility and also forms the basis of emission reductions calculation during this monitoring period. Verification team has cross-checked the net electricity supplied to the grid by the WTG of the project activity with the monthly invoices raised by the PP to state electricity company. This cross check reveals that there is no discrepancy between the values of the net electricity supplied to the grid by the WTG of the project activity reported in the certificate of shares and the invoices.

According to the power purchase agreement, the net electricity delivered at the substation will be used for the financial transaction. The PPA also describes that certificate issued by GEDA for generation share of wind turbine should be used for billing.

Billing is done once in a month. For billing, the data is recorded in presence of representatives of the PP and State Grid Body. Further, the apportioned electricity certificate is issued by the relevant department of the State Grid Body in accordance with the provisions of the PPA.

During the on-site verification, QA/QC procedures were identified which demonstrate that: operation management regulations of the power plant were in place; all meters were calibrated; electricity data was crosschecked; data was archived electronically; emergency procedures were in place; and all operational staff were trained before taking up positions. The verification team thus confirmed that the monitoring of the project activity has been implemented in accordance with the monitoring plan in the registered PDD.

The accuracy of individual energy meters of WTG is 0.5s and substation meter is 0.2s. But the registered CDM PDD states the accuracy class of all the energy meters as 0.2s. CAR 01 was raised in this respect. In response, in line with the CDM PS, version 05.0, Appendix 1, PP has applied a correction of 0.3% (i.e. difference in between the accuracy class mentioned in the registered PDD and actual accuracy class of the installed meters during the monitoring period).

The energy meters are calibrated at an annual frequency which is line with the registered PDD.

Correction has been applied in a conservative manner due to delayed calibration for the meters in accordance to the paragraph 239 of CDM VVS, version 05.0.

The registered CDM PDD clearly describes the monitoring and responsibility of monitoring is with PP. PP has authorized Vestas for O&M duties at site through service and availability agreement. During the site visit, monitoring and reporting procedures were confirmed with the relevant staff and through the document review.

The monitoring plan is in accordance with the UNFCCC approved methodology ACM 0002, version 12.3. All the data is collected and archived in accordance with the methodology and included in the monitoring plan.

The team confirms that the calculation of the emission reductions following the applied methodology has been correctly done.

Base line emissions

As per the registered PDD and the applied methodology, the baseline is the energy supplied by the renewable generating unit (Net saleable energy) multiplied by the emission coefficient (Emission Factor of the grid).

Baseline emission=Net saleable energy X Emission factor of the grid

Project emissions

Project emissions and leakage emissions are considered nil as per the applied methodology.

Leakage emissions

As per the applied methodology and the registered CDM PDD leakage are not considered for the project activity.

Since the project emission and the leakage emissions are nil, the emission reductions by the project activity is the same as the baseline emissions.

The project activity is registered as CDM project under UNFCCC with project reference number as 7671. But under VCS, the PP is claiming emission reductions for the period from 14/07/2011 to 21/10/2012 and the CDM first renewable crediting period is from 22/10/2012 to 21/10/2019. Hence there is no overlap for claim of emission reductions in between VCS program and the other GHG program, i.e. CDM. The project has not been rejected under any other GHG programs. PP has provided a declaration in this respect.

There is no material discrepancy found between the information in the CDM PDD, MR and related supporting document and the monitoring system of the project activity. Hence the verification team confirms that the project has been implemented as described in the project description in the registered CDM PDD.

4.2 Accuracy of GHG Emission Reductions and Removal Calculations

Emission Reductions Due to Project Activity

Emission reductions = Baseline emission – Project emission – Leakage

Being a wind energy project, the project activity does not lead to any form of emission; Hence Project Emission (PE_y) =0.

Also the leakage for the project activity is nil as per the registered PDD and the applied methodology. Hence Leakage (L_y) =0

So, Emission Reductions = Baseline Emission

According to the registered PDD and the MR, the baseline emissions for the project activity have been calculated as:

$BE_y = EG_{facility,y} * EF_y$

Where, BE_y = Baseline emissions,

$EG_{facility,y}$ = Net electricity supplied to the grid

EF_y = Grid emission factor

Monitoring parameter and calibration checklist:

Data / Parameter (as in the MP)		**$EG_{facility,y}$ <Net Electricity exported to grid>**
Value	Ex ante	71,342 (for the monitoring period)
	Ex-post	56,116
Measuring frequency		Continuously
Reporting frequency		Monthly
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes
Recording (Manually / electronically)		Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,…)		Invoices prepared by the PP
Type of Monitoring Equipment and Identification number or Reference in the PDD		Monitoring equipment: Electronic tri-vector meters
Is accuracy of the monitoring equipment as stated in the PDD? If not stated in the PDD, does it represent good monitoring practices?		Yes. Accuracy of the substation meters is stated as 0.2s in the PDD which was confirmed from the site visit. Accuracy of the meters at the WTG transformer yard is 0.5s. But the in the CDM registered PDD it is stated as 0.2s. CAR 01 was raised in this respect. In response PP has applied the differential error in line with paragraph 4 of Appendix 1 of CDM Project Standard, version 05.0. The value of net energy supplied to the grid has been adjusted in a conservative manner.
Period of operating time		14/07/2011 to 21/10/2012
Instrument type		Bi-directional trivector energy meter
Manufacturer, model and serial number		Details of the energy meters installed at the WTG yard:

WTG number	**Main meter (period in service)**
JW 27	GJU61847 (14/07/2011 to 21/10/2012)
NM 04	GJU61852 (14/07/2011 to 21/10/2012)
VW 21	GJU61844 (14/07/2011 to 21/10/2012)
VW 32	GJU61845 (14/07/2011 to 21/10/2012)
NM 82-3	GJU64151 (14/07/2011 to 21/10/2012)
NM 06	GJU64150 (14/07/2011 to 21/10/2012)
NM 07	GJU64154 (14/07/2011 to 21/10/2012)

<table>
<tr><td>Data / Parameter
(as in the MP)</td><td>$EG_{facility,y}$ <Net Electricity exported to grid></td></tr>
<tr><td></td><td>
<table>
<tr><td>JW 09</td><td>GJU64145 (14/07/2011 to 21/10/2012)</td></tr>
<tr><td>JW 10</td><td>GJU64174 (14/07/2011 to 21/10/2012)</td></tr>
<tr><td>JW 12</td><td>GJU64152 (14/07/2011 to 21/10/2012)</td></tr>
<tr><td>JW 13</td><td>GJU64146 (14/07/2011 to 21/10/2012)</td></tr>
<tr><td>JW 30 New</td><td>GJU64165 (14/07/2011 to 21/10/2012)</td></tr>
</table>
Main meters are manufactured by Secure Meters

Vandhiya Substation:
Serial number:
Line 1 - GJ-0670-A (14/07/2011 to 21/10/2012)
Line 2 - GJ-0671-A (14/07/2011 to 21/10/2012)

Substation meters are manufactured by L & T

All the above meters are tri vector bi-directional meters</td></tr>
<tr><td>Specific location</td><td>Individual meters are provided on 33 kV line at the respective WTGs and the sub-station meters are located at the sub-station (Vandhiya)</td></tr>
<tr><td>Calibration dates</td><td>WTG yard meters
<table>
<tr><th>Meter serial no.</th><th>Calibration date</th></tr>
<tr><td>JW 27</td><td>07/06/2011; 11/06/2012</td></tr>
<tr><td>NM 04</td><td>07/06/2011; 11/06/2012</td></tr>
<tr><td>VW 21</td><td>07/06/2011; 11/06/2012</td></tr>
<tr><td>VW 32</td><td>07/06/2011; 11/06/2012</td></tr>
<tr><td>NM 82-3</td><td>28/11/2011; 13/12/2012</td></tr>
<tr><td>NM 06</td><td>28/11/2011; 13/12/2012</td></tr>
<tr><td>NM 07</td><td>28/11/2011; 13/12/2012</td></tr>
<tr><td>JW 09</td><td>28/11/2011; 13/12/2012</td></tr>
<tr><td>JW 10</td><td>28/11/2011; 13/12/2012</td></tr>
<tr><td>JW 12</td><td>28/11/2011; 13/12/2012</td></tr>
<tr><td>JW 13</td><td>28/11/2011; 13/12/2012</td></tr>
<tr><td>JW 30 New</td><td>28/11/2011; 13/12/2012</td></tr>
</table>
Sub-station meters
<table>
<tr><th>Meter serial no.</th><th>Calibration date</th></tr>
<tr><td>GJ-0670-A</td><td>15/10/2009; 17/01/2012</td></tr>
<tr><td>GJ-0671-A</td><td>15/10/2009; 17/01/2012</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Data / Parameter
(as in the MP)</th><th>$EG_{facility,y}$ <Net Electricity exported to grid></th></tr>
<tr><td>Company performing the calibration</td><td>Paschim Gujarat Vij Nigam Limited, a sister company of GETCO[2]</td></tr>
<tr><td>Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?</td><td>Yes</td></tr>
<tr><td>Is calibration valid for the whole reporting period?</td><td>No. The meters were in service beyond the due dates of their calibration as below:

WTG Yard Meters
<table>
<tr><th>Meter serial no.</th><th>Period in service beyond the due date of calibration</th></tr>
<tr><td>JW 27</td><td>07/06/2012 to 10/06/2012</td></tr>
<tr><td>NM 04</td><td>07/06/2012 to 10/06/2012</td></tr>
<tr><td>VW 21</td><td>07/06/2012 to 10/06/2012</td></tr>
<tr><td>VW 32</td><td>07/06/2012 to 10/06/2012</td></tr>
<tr><td>NM 82-3</td><td>28/11/2012 to 12/12/2012</td></tr>
<tr><td>NM 06</td><td>28/11/2012 to 12/12/2012</td></tr>
<tr><td>NM 07</td><td>28/11/2012 to 12/12/2012</td></tr>
<tr><td>JW 09</td><td>28/11/2012 to 12/12/2012</td></tr>
<tr><td>JW 10</td><td>28/11/2012 to 12/12/2012</td></tr>
<tr><td>JW 12</td><td>28/11/2012 to 12/12/2012</td></tr>
<tr><td>JW 13</td><td>28/11/2012 to 12/12/2012</td></tr>
<tr><td>JW 30 New</td><td>28/11/2012 to 12/12/2012</td></tr>
</table>
Sub-station meters: 15/10/2010 to 16/01/2012

Corrections have been applied in conservative manner accordance with paragraph 238 of CDM VVS, version 05 which is deemed acceptable by the verification team.</td></tr>
<tr><td>Maintenance</td><td>Individual meters of the WTGs are being maintained by the PP, bulk meters at the substation are being maintained by GETCO</td></tr>
<tr><td>Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?</td><td>Yes. The net electricity exported to the grid was jointly taken by the representative of the PP and government agency. Based on the apportioning electricity a share certificate was issued by GEDA. This is also used for billing. Verification team confirmed from the review of the share certificates, invoices and measurement readings that correct data has been transferred. Further, for calculation of the emission reductions only the net electricity generation is required to be monitored. Therefore, it can be concluded that correct</td></tr>
</table>

[2] http://www.pgvcl.com/

Data / Parameter (as in the MP)	$EG_{facility,y}$ <Net Electricity exported to grid>
	data has been transferred for reporting of emission reduction.
Key reporting risks	Low risk The meter is also the resettlement meter for the grid company and the PP. It was installed, maintained and calibrated according to the relevant industry standard.

BE_y = 56116 x 0.9486
= 53231 tCO_2e

EF_y is the baseline emission factor which has been determined ex-ante in the registered PDD as 0.9486 tCO_2e/MWh.

The verification team has checked and confirmed the calculations in the spreadsheet and found to be correct. The monitoring report is supported by Microsoft excel based spreadsheet for the calculation of emission reductions. The consistency and formula were verified and found to be accurate.

The net electricity generation has been verified against the share certificates issued by the Gujarat Energy Development Agency. Verification team confirms that the electricity board calculates the electricity figures based on the methodology and formulae provided in the PDD.

Through these approaches, the verification team confirmed that the data for calculation of emission reductions in the MR and Emission reductions spreadsheet submitted were fully substantial.

Although as per the section 5.3.1 #4 of the VCS standard, the threshold for materiality with respect to the aggregate of errors, omissions and misrepresentations relative to the total reported GHG emission reductions and/or removals shall be restricted to 5%, the validation team has checked 100% of the monitoring data and no error in the calculation of emission reduction was detected. This is beyond the stated requirement and hence conservative.

After the closure of all the CARs and CLs raised, the verification team confirms that the GHG emission reductions for the project activity have been quantified correctly in accordance with the project description and the applied methodology ACM 0002, version 12.3.

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

When verifying the report emission reduction, LRQA ensured that there was a clear audit trail that contained the evidence and records that validate the stated figures. All source documents that form the basis for assumptions and other information underlying the GHG data are shown in paragraph 2.2 above.

When assessing the audit trails, LRQA also examined:

1. whether sufficient evidence was available, both in terms of frequency and in covering the full monitoring period
2. the source and nature of the evidence
3. if comparable information was available from sources other than that used in the monitoring report, LRQA cross-checked the monitoring report against the other sources to

confirm that the stated figures were correct. The sources and the data referenced are shown in paragraph 2.2.

LRQA also assessed that the data collection system met the requirements of the monitoring plan as per the applied methodology.

Proper data management inclusive of data acquisition and aggregation, data management system is being followed for the project activity. As per the registered monitoring plan, the energy meters are to be calibrated annually once which has been followed for the monitoring period. Wherever energy meters are used beyond the due dates of calibration, error has been applied in a conservative manner for the calculation of emission reductions in accordance with paragraph 238 of CDM VVS, version 05.0 which is deemed acceptable by the verification team.

All records needed for monitoring are archived in line with the requirements of the registered monitoring plan. No lack of evidence and missing data were detected during on-site verification.

The monitoring personnel at site are well trained and follow reproducible routines. Thus, they are competent to carry out the relevant tasks with sufficient accuracy.

4.4 Non-Permanence Risk Analysis

The project activity was operational during the complete monitoring period. The actual net electricity exported to the grid by the project activity has been monitored and sourced from the share certificates which is an authentic document issued by GETCO. PP also has an operational and maintenance agreement with the technology supplier for the WTGs installed under the project activity. Hence there is no further requirement for the non-performance analysis rating during the monitoring period of the project activity.

5 VERIFICATION CONCLUSION

The scope of the verification relates to the registered CDM PDD (UNFCCC reference number - 7671) and the VCS PD submitted to verification team. The verification team confirm that the project has been implemented in accordance with the project description and the registered CDM PDD.

Verification period: From 14/07/2011 to 21/10/2012 (both days inclusive).

Verified GHG emission reductions and removals in the above verification period:

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
2011 (14/07/2011 – 31/12/2011)	5,443	-	-	5,443
2012 (01/01/2012 – 21/10/2012)	47,788	-	-	47,788
Total	53,231	-	-	**53,231**

The verification team is of the opinion that the project has been implemented in accordance with the registered project description, the MP with complies with the approved monitoring methodology, the monitoring complies with the MP and the monitored data and calculation of ERs are assessed and confirmed as correct.

Therefore LRQA hereby certifies, and requests the issuance of, the reported ERs of "Green Energy Project at Kutch by Powerica Limited" during the monitoring period of 14/07/2011 to 21/10/2012 amounting to 53,231 tCO_2e to the VCS Registry.

Decision Maker



Prabodha C Acharya
General Manager, Climate Change Services, South Asia
27/02/2014

APPENDIX A: Abbreviations

BE	Baseline emissions
CAR	Corrective action request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CER	Certified Emission Reduction
CL	Clarification
DOE	Designated Operational Entity
ERs	Emission reductions
FAR	Forward action request
GEDA	Gujarat Energy Development Agency
GETCO	Gujarat Energy Transmission Company Limited
GHG	Greenhouse gas
GUVNL	Gujarat Urja Vikas Nigam Limited
JMR	Joint Meter Reading
kW	Kilo Watt
kWh	Kilo Watt hour
LR	Lloyd's Register
LRQA	Lloyd's Register Quality Assurance Limited
MP	Monitoring plan
MR	Monitoring Report
MW	Mega Watt
MWh	Mega Watt hour
NA	Not applicable
NEWNE	Northern, Eastern, Western, and North-Eastern Grid
O&M	Operation & Maintenance
PD	Project Description
PDD	Project design document
PLF	Plant Load Factor
PP	Project proponent
PPA	Power Purchase Agreement
PS	Project Standard
QA/QC	Quality Assurance / Quality Control
SLDC	State load dispatch center
tCO_2e	Tonne of carbon dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCSA	VCS Association
VCU	Verified Carbon Unit
VVM	Validation and Verification Manual
VVS	Validation and Verification Standard
WTG	Wind Turbine Generator

APPENDIX B: Finding Log[3]

1. Grade / Ref:	CAR 01 / MR section 3.2	**2. Date:**	13/01/2014	**3. Status:**	Closed
4. Requirement		Paragraph 4 of Appendix 1 of CDM Project Standard, Version 05.0			
5. Nature of the Issue Raised:					
As per the registered PDD with UNFCCC, the accuracy of all the meters is supposed to be 0.2s. But during the monitoring period, the WTG yard meters used are of accuracy class 0.5s.					
6. Nature of responses provided by the project participants:					
In accordance with paragraph 4(a) of appendix-1, of Clean development mechanism project standard, version 05.0, the measured values are adjusted in the revised ER sheet and monitoring report to account the difference in accuracy class i.e. 0.5-0.2=0.3.					
7. Assessment of such responses:					
In line with the CDM PS, version 05.0, Appendix 1, PP has applied a correction of 0.3% (i.e. difference in between the accuracy class mentioned in the registered PDD and actual accuracy class meter installed during the monitoring period). Hence the CAR is closed.					
8. References to resulting changes in the monitoring report or supporting annexes:					
MR sections 1.1, 3.2, 4.1 & 4.4 and ER spread sheet					

[3] Explanation of the Findings Log structure:
1. Grading and Sequential Number of the finding
2. Date of Original Finding
3. New, Open, Closed
4. Reference to Workbook
5. Details of PP's response
6. Evaluation from the Verification team
7. List of changes made as a result of the finding

1. Grade / Ref:	CL 01 / MR Appendix 2 / ER spread sheet	**2. Date:**	13/01/2014	**3. Status:**	Closed
4. Requirement		Paragraph 285 of VVS, Version 05.0			
5. Nature of the Issue Raised:					
Evidence of the daily LCS meter readings based on which apportioning has been done for the month of October 2012 has not been provided.					
6. Nature of responses provided by the project participants:					
The LSC meter readings used for calculation for the month of October 2012 is being provided to the DoE herewith.					
7. Assessment of such responses:					
Evidence for the daily LCS meter readings maintained by Vestas has been provided. Hence the CL is closed.					
8. References to resulting changes in the monitoring report or supporting annexes:					
-					

1. Grade / Ref:	CL 02 / MR section 4.1	**2. Date:**	13/01/2014	**3. Status:**	Closed
4. Requirement		Paragraph 244 of VVS, Version 05.0			
5. Nature of the Issue Raised:					
The values reported for the parameter "$EG_{facility,y}$" in section 4.1 of the MR do not exactly match to decimal places with the share certificates provided. Also the reference of the CDM EB guidelines made (EB 70, Annex 3) for the application of correction is not the latest guideline.					
6. Nature of responses provided by the project participants:					
The values are now corrected in section 4.1 of the revised monitoring report. The reference of the CDM EB guidelines is now updated with the latest one.					
7. Assessment of such responses:					
PP has corrected the electricity supply values as per the share certificates in the revised MR. Also the reference of EB 70, Annex 3 has been removed and the latest version of CDM Project Standard (version 05.0) has been provided. Hence the CL is closed.					
8. References to resulting changes in the monitoring report or supporting annexes:					
ME section 4.1					

1. Grade / Ref:	CL 03 / PD section 1.13	**2. Date:**	13/01/2014	**3. Status:**	Closed
4. Requirement		VCS Project Description template, Version 3			
5. Nature of the Issue Raised:					
PP needs to clarify the statement "*Also, as per ACM 0002 Version 13.3.0, no leakage has been considered for the calculation of emission factor*" in section 1.13 of the VCS PD.					
6. Nature of responses provided by the project participants:					
The same has been corrected in the revised VCS PD.					
7. Assessment of such responses:					
PP has submitted revised VCS PD with appropriate correction. Hence the CL is closed.					
8. References to resulting changes in the monitoring report or supporting annexes:					
VCS PD section 1.13					

1. Grade / Ref:	CL 04 / PD section 1.6	**2. Date:**	13/01/2014	**3. Status:**	Closed
4. Requirement		VCS PD template			
5. Nature of the Issue Raised:					
In section 1.6 of the VCS PD, version 01, dated 20/11/2013, the number of days during the monitoring period has been stated as 462. PP needs to clarify.					
6. Nature of responses provided by the project participants:					
The number days has been corrected to 465 in both revised VCS PD and monitoring report.					
7. Assessment of such responses:					
The number of days during the monitoring period has been corrected to 465. Hence the CL is closed.					
8. References to resulting changes in the monitoring report or supporting annexes:					
MR section 1.6					

1. Grade / Ref:	CL 05 / VCS PD	**2. Date:**	13/01/2014	**3. Status:**	Closed
4. Requirement		VCS PD template			
5. Nature of the Issue Raised:					
The font size used in some sections of the PD, are not in accordance with the VCS PD template. In the VCS PD, the table of content starts with section 2. Where is section 1? In the VCS PD, although in the table of content "APPENDIX" appears, but it is found blank in the PD. PP needs to provide the full forms of the abbreviations where ever used in the PD. Section 1.7 of the PD is not as per the VCS PD template.					
6. Nature of responses provided by the project participants:					
The font in the revised VCS PD has now been made consistent with the VCS template. The table of content is corrected in the revised VCS PD. Appendix-1 for list of abbreviation is now incorporated in the revised VCS PD. The list is abbreviation is now included in the appendix-1 of the revised VCS PD. Section 1.7 of the PD is corrected and made consistent with the VCS PD template.					
7. Assessment of such responses:					
The font in the revised VCS PD has now been made consistent with the VCS template. The table of content is corrected in the revised VCS PD. Appendix-1 for list of abbreviation is now incorporated in the revised VCS PD. The list is abbreviation is now included in the appendix-1 of the revised VCS PD. Section 1.7 of the PD is corrected and made consistent with the VCS PD template.					
8. References to resulting changes in the monitoring report or supporting annexes:					
VCS PD					

APPENDIX C: Certificate of appointment

Verification of "Green Energy Project at Kutch by Powerica Limited"

We hereby certify that the following personnel have engaged in the verification process that has fully satisfied the competence requirements of the verification of the VCS project activity.

Name of Person	Assigned Roles
Sanjay Kumar Agarwalla	Team Leader and Sector expert
Archak Pattanaik	Technical Reviewer and Sector expert
Prabodha C Acharya	Decision Maker

Signed by

Decision Maker



Prabodha c Acharya

General Manager, Climate Change Services, South Asia

27/02/2014