

VERIFICATION REPORT OF GRID CONNECTED WIND ENERGY PROJECT IN TAMIL NADU



Document Prepared By

BUREAU VERITAS CERTIFICATION HOLDING SAS

67/71 BOULEVARD DU CHATEAU, 92200 NEUILLY SUR SEINE CDX – FRANCE

climatechange.ops@uk.bureauveritas.com

www.bureauveritas.com

Project Title	Grid Connected Wind Energy Project in Tamil Nadu
Version	01
Report ID	BVC/INDIA – VCS- VER/665.49/2016

Report Title	Verification Report of Grid Connected Wind Energy Project in Tamil Nadu
Client	CLP Wind Farms (Theni-Project II) Private Limited
Pages	26
Date of Issue	07 November 2016
Prepared By	Bureau Veritas Certification Holding SAS
Contact	67/71 Boulevard du Château, 92200 Neuilly sur Seine, France Tél. : +33 (0)1 55 24 70 00 Fax : +33 (0)1 55 24 70 climatechange.ops@uk.bureauveritas.com www.bureauveritas.com
Approved By	Mr. Rajendra Sharma
Work Carried Out By	Ms. Sapana Pednekar (Team Leader) Mr. Sanjay Patankar (Internal Technical Review)

Summary:

Bureau Veritas Certification has performed the third verification of the VCS Project ID 911 “Grid Connected Wind Energy Project in Tamil Nadu” project of CLP Wind Farms (Theni-Project II) Private Limited located across villages of G.Usulampatti, Mottanoothu, Kothapatti, Shanmuga Sundara Puram & Marikundu in District Theni of Tamil Nadu State in India on the basis of Verified Carbon Standard Version 3, 19 October 2016, v3.6 as well as criteria given to provide for consistent project operations, monitoring and reporting.

The verification scope is defined as a periodic independent review and ex-post determination by the Validation Verification Body (VVB) of the monitored reductions in GHG emissions during defined verification period, and consisted of the following three phases:

- i) desk review of the project design and the baseline and monitoring plan;
- ii) follow-up interviews with project stakeholders;
- iii) Resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The project activity is to generate power (electrical energy) from renewable energy (wind energy), which displaces power generation from fossil fuel that would have been the scenario in absence of the project activity, thus achieve GHG emission reduction due to utilization of renewable energy.

The verification is based on the documents like Monitoring Report, Project description (PD), Emission Reduction calculations and other supporting documents provided to the verification team. This verification is carried out in accordance with VCS Standard Version 3 dated 19 October 2016 v3.6 and VCS Program Guide Version3, dated 19 October 2016 v3.6.

During the current verification, the verification team raised findings in the form of corrective action requests (CARs) and Clarification requests (CLs).

In summary, Bureau Veritas Certification confirms that the project is implemented as planned and described in VCS-Project Description. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project contributes towards GHG emission reductions. The GHG emission reduction is calculated without material mis-statements.

Contents

1	Introduction.....	6
1.1	Objective.....	6
1.2	Scope and Criteria	6
1.3	Level of Assurance.....	6
1.4	Summary Description of the Project.....	7
2	Verification Process.....	7
2.1	Method and Criteria.....	8
2.2	Document Review	8
2.3	Interviews.....	9
2.4	Site Inspections.....	9
2.5	Resolution of Findings.....	9
2.5.1	Forward Action Requests	9
2.6	Eligibility for Validation Activities.....	10
3	Validation Findings	10
3.1	Participation under Other GHG Programs.....	10
3.2	Methodology Deviations	10
3.3	Project Description Deviations.....	10
3.4	Grouped Project.....	11
4	Verification Findings	11
4.1	Project Implementation Status.....	11
4.2	Accuracy of GHG Emission Reduction and Removal Calculations	13
4.3	Quality of Evidence to Determine GHG Emission Reductions and Removals	14
4.4	Non-Permanence Risk Analysis	17
5	Safeguards.....	17

5.1	No Net Harm	17
5.2	Local Stakeholder Consultation	17
6	Verification conclusion	17
APPENDIX I: Details of corrective actions and clarification requested		20
ANNEXURE II: Documents referred during Verification and Validation of the Project Activity.....		25
ANNEXURE III: List of Persons interviewed		25
ANNEXURE IV: Curricula Vitae of the Verification Team Members		26

Abbreviations:

VER	Verified Emission Reduction
VCS	Verified Carbon Standard
VCU	Verified Carbon Unit
CAR	Corrective Action Request
CL	Clarification Request
FAR	Forward Action Request
CO ₂	Carbon Dioxide
DR	Document Review
GHG	Green House Gases
I	Interview
IETA	International Emissions Trading Association
MV	Means of Verification
MP	Monitoring Plan
MR	Monitoring Report
NGO	Non-Governmental Organization
PD	Project Description
PDD	Project Design Document
UNFCCC	United Nations Framework Convention for Climate Change
CDM	Clean Development Mechanism
MU	Million Units
KW	Kilowatt
KWh	Kilowatt-hour
MW	Megawatt
MWh	Megawatt-hour
EF	Emission factor
TANGEDCO	Tamil Nadu Generation and Distribution Company Limited
PPA	Power Purchase agreement
JMR	Joint Meter Reading
CEA	Central Electricity Authority
PP	Project Proponent
WTG	Wind Turbine Generator
VVB	Validation Verification Body

1 INTRODUCTION

1.1 Objective

Verification is the periodic independent review and ex-post determination by the verifier of the monitored reductions in GHG emissions during defined verification period. The objective of the verification is to verify that the project is implemented as planned, to confirm that the monitoring system is in place and fully functional, and to assure that the project has generated verifiable emission reductions. This is third verification of the project activity under VCS for the vintage from 04/10/2012 to 09/06/2016 (inclusive of both the days). These emission reductions are verified as per the guidance provided by VCS standards version 3 dated 19 October 2016 v3.6.

The verification shall consider both qualitative and quantitative information on emission reductions. Quantitative data comprises the monitoring report and emission reduction calculations submitted to the verifier by the project proponent and qualitative data comprises information on internal management controls, calculation procedures, and procedures for transfer, frequency of emission reduction reports, review and internal audit of calculations/data transfers.

1.2 Scope and Criteria

The verification scope is defined as an independent and objective review of monitoring report, VCS PD of the project for the project's baseline study including the monitored data and other relevant documents made available to verifier and information collected through performing interviews with Project proponent during on-site assessment of the project activity. The verification follows VCS Standard version 3 dated 19 October 2016 v3.6.

The verification is not meant to provide any consultation towards the client. However, stated request for forward actions and/or corrective actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.

1.3 Level of Assurance

The verification team was provided with a monitoring report, covering the period 04/10/2012 to 09/06/2016 (inclusive of both the days). Based on this documentation, a document review, on-site assessment of implementation of the project activity and interview with the project proponent was conducted. The Monitoring Report, version 04, dated 08/11/2016 (/2/) covering the period from 04/10/2012 to 09/06/2016 (inclusive of both the days) serves as the basis for the assessment presented herewith.

The verification report is based on the documents made available to verification team and information provided during interviews. Based on the process and procedures conducted, it can be concluded that the GHG assertion.

1. Is materially correct and is a fair representation of GHG data and information, and
2. Has been prepared in accordance with VCS Standard Version 3 dated 19 October 2016 v3.6.

The data used for the calculation of emission reductions were taken from CEA (Central Electricity Authority), JMR issued by TANGEDCO and Invoice raised by the Project proponent for the net electricity exported to the grid by project activity. As per the VCS PD, revised VCS MR; the calibration for the meters will be done every 3 years. During the current monitoring period, the calibration frequency was not found followed and the details of the same are discussed in the following sections of the report. There was one instance when meter were changed during the current verification period. During site visit and subsequent review of meter calibration reports it was confirmed that there was only one meter change in the project activity during the current monitoring period. Verification is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of emission reductions.

Based on the process and procedure conducted, it can be concluded that the GHG assertion is materially correct and is a fair representation of GHG data and information which has been prepared in accordance with the VCS Standard 3 v3.6 for the current verification period.

The verification team considers the assurance level as '**reasonable**'. In accordance with the VCS Standard 3 dated 19 October 2016 v3.6, the materiality threshold applied was five percent. The accrued emission reductions for the current monitoring period from the project activity are 247,885 tCO₂e.

1.4 Summary Description of the Project

The project activity is owned by M/s CLP Wind Farms (Theni-Project II) Private Limited (hereafter referred to as "the Project Proponent"). The installed capacity of the project activity is 49.5MW. It involves the installation of Vestas make 30 numbers Wind Turbine Generator's (WTG) of capacity 1650 KW each located across 5 villages namely, G.Usulampatti, Mottanoothu, Kothapatti, Shanmuga Sundara Puram & Marikundu in Theni District in the state of Tamil Nadu, India. The entire power generated by the project activity is exported to the Southern region grid with a firm power purchase agreement with TANGEDCO.

The project activity generates electricity using wind energy, which does not result in any greenhouse gas (GHG) emissions. Thus, this project activity leads to a reduction in GHG emissions that would otherwise have occurred when using electricity generated from conventional fossil fuel based sources in the Southern region grid.

The Project Start Date is 25/06/2010, when the first WTG in the Project activity was commissioned and started electricity generation. The 3rd monitoring period for the Project under the VCS is from 04/10/2012 to 09/06/2016.

Project Title	Grid Connected Wind Energy Project in Tamil Nadu.
Monitoring period	04/10/2012 to 09/06/2016 (inclusive of both the days)
Project proponent	CLP Wind Farms (Theni Project II) Private Limited
Methodology used	ACM 0002 version 13
Location of the project	G.Usulampatti, Mottanoothu, Kothapatti, Shanmuga Sundara Puram & Marikundu villages in Theni District in Tamil Nadu State, India
Geo Coordinates	As provided in Annexure 1of VCS PD and section 1.7 of the monitoring report

A set of bidirectional (main and check) energy meters are installed near each WECs to account the electricity supplied to the grid. The main meter readings are recorded monthly by representatives of the respective electricity board (TANGEDCO) and Project participant's representative. Based on this monthly recording, the state electricity board issues the 'joint meter reading' (JMR) termed as Statement of Energy every month.

The verification team cross-checked all the Energy statements issued by TANGEDCO, invoices raised by Project Participant for corresponding months and confirms that the generated electricity has been sold to the grid and not used for any other purpose throughout the current monitoring period.

The project activity generates electricity using wind energy, which does not result in any greenhouse gas (GHG) emissions. Thus, this project activity leads to a reduction in GHG emissions that would otherwise have occurred when using electricity generated from conventional fossil fuel based sources in the Southern region grid.

2 VERIFICATION PROCESS

2.1 Method and Criteria

The overall verification, beginning from the Contract Review to Verification report & opinion, was conducted using Bureau Veritas Certification internal procedures.

The verification criteria followed by the project proponent is based on the VCS standards Version 3 dated 19 October 2016 v3.6. This is third verification of the project activity under VCS for the vintage from 04/10/2012 till 09/06/2016 (inclusive of both the days). The verification process consists of following activities:

- i) Desk review of the registered project document including the baseline and the monitoring plan: This process consists of the review of the current and previously approved documents related to the project activity including VCS PD, previous verification documents. The current documents include the Monitoring report for the current verification period, emission reduction spreadsheet and other supporting documents (JMR issued by TANGEDCO, invoices raised by the Project proponent, calibration certificates, meter change document, etc.) pertaining to the current verification period. Refer to Appendix II for the list of documents.
- ii) Interviews with project stakeholders and Document Review: The second step involves the Interviews and discussion with the Project Proponent and as well as review of documents provided under Annexure II to ensure the implementation and operation of the project activity in line with the approved VCS documents;
- iii) Resolution of outstanding issues and the issuance of the final verification report including verification opinion: The third step involves the resolution of the CAR/CL raised. Verification process also includes raising the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification before conclusion on the GHG emission reduction calculation.

To guarantee the transparency of the verification process, the concerns raised are documented in more detail in the verification protocol in Annexure I. The verification of the Project resulted in 02 Corrective Action Requests (CARs) and 05 Clarification Requests (CL).

All the CARs and CLs were closed based on adequate responses from the Project Proponent(s) which meets the applicable requirements. They have been reassessed before their formal acceptance and closure. The closure of all the CARs and CLs are discussed under Annexure I of the verification report.

The project activity involves 100% monitoring of data related to emission reduction calculation. No sampling plan has been envisaged.

2.2 Document Review

The verification team has assessed the accuracy of the project description including monitoring plan through a combination of steps consisting of site visit inspection, review of contract related to the project activity, Scrutiny of technical specification and interview of the project proponent and their representatives. Following supporting documents were reviewed for the current verification period:

- VCS PD of the project activity, previous verification documents;
- Monitoring report and emission reduction spreadsheet for the current verification period,
- JMR issued by TANGEDCO on monthly basis and corresponding monthly Invoices raised by the Project proponent for the current verification period, Meter Calibration certificates, meter replacement certificate issued by the TANGEDCO, etc.

Based on this documentation, a document review and an on-site assessment of implementation and emission reduction was conducted. The Monitoring Report, version 4, dated 08/11/2016 covering the period 04/10/2012-09/06/2016 (inclusive of both the days), serves as the basis for the assessment presented herewith.

2.3 Interviews

During site visit conducted on 27/09/2016, Bureau Veritas Certification performed interviews with the representative of the project proponent and O & M Service provider to confirm selected information and to resolve issues identified in the document review.

Representatives of CLP Wind Farms (Theni-Project II) Private Limited and O & M Service providers were interviewed. The main topics of the interviews are summarized in Table below:

Interviewed organization	Interview topics
CLP Wind Farms (Theni-Project II) Private Limited (Project Proponent)	• Project implementation and changes; if any • Monitoring Plan • Monitored Data • Data recording and archiving • GHG calculation procedures • Resolution of CAR(s) and CL(s) • Change to the registered monitoring plan (if any)
Vestas Wind Technology India Private Limited(O & M Service providers)	• Metering System at the site, • Technical Equipment and operation • Monitoring • Data Recording and archiving • Calibration of measuring equipment • Data uncertainty and residual risks

The details of the personnel interviewed are provided in Annexure III of the report.

2.4 Site Inspections

This is third verification of the project activity under VCS for the monitoring period starting from 04/10/2012-09/06/2016 (inclusive of both the days). The physical site visit for the verification period carried out by Team leader on 27/09/2016.

The verification team reviewed all the JMR records of the sold electricity (issued by the TANGEDCO; state electricity utility which is a government entity) for the current verification period and confirms that there is no change in the project design with respect to the VCS validated PD.

2.5 Resolution of Findings

The verification team confirms that there are no remaining issues or any material discrepancy in the registered documents on VCSA website and supporting documents mentioned under Annexure II of this report. However, during current verification period there were 02 Corrective Action Requests and 05 Clarification Requests raised and were subsequently closed by the verification team on the basis of correct and appropriate response by the Project proponent. The closure of CAR(s) and CL are discussed under Annexure I of the verification report.

2.5.1 Forward Action Requests

There was no forward action request raised during previous verification. During current verification period, there was no outstanding discrepancy observed by the verification team. Hence, no Forward Action Request was raised.

2.6 Eligibility for Validation Activities

Not Applicable as it is third verification of the project which is validated and registered under CDM and VCS. BVCH holds accreditation for Validation and Verification of Sectoral Scope 1 in which this project qualifies.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

This is third periodic verification for the registered VCS project activity with project ID 911. Hence this section is not applicable.

This project is already registered under CDM but, Project Proponent has provided a self-declaration in this regard which confirms that Project Proponent will not claim Emission reductions for current monitoring period from 04/10/2012 to 09/06/2016 (inclusive of both the days) under any other GHG program except VCS.

3.2 Methodology Deviations

Not Applicable

3.3 Project Description Deviations

The Project proponent has proposed for two deviations in the current verification period.

As per the approved project description in the approved VCS PD, every 3 years meters were to be calibrated. However, during current verification period, it was observed that there was delay in calibration of meters beyond the stipulated frequency of 3 years. This delay in calibration can be termed as the deviation from the information provided in the project description of the VCS PD. Further Verification team also noted that the energy meters and it's the frequency of calibration are not in jurisdiction of Project participant or its representatives, but are with TANGEDCO. Hence Project participant do not have any role to play in the same.

In line with paragraph 3.6.2 of VCS Standard version 3, dated 19 October 2016 v3.6, verification team confirms that the deviation is appropriately described and the delay in calibration of meters is considered in line with the requirement as stipulated in para 395 and 395 of validation and verification standard (VVS), EB 65 A04 Version 09 to readings of Net electricity exported for the duration of delay. The verification team confirms that by application of error as per this guidelines leads to lower the baseline emissions and thus provides the conservative quantity of Emission Reductions.

The verifier has therefore accepted this deviation as it will not impact the accuracy of the electricity generation and consequently, that of the emission reductions claimed. The deviation also has no effect on the applicability of the methodology, additionality or the appropriateness of the baseline scenario as it is only related to the monitoring arrangements within the project. This is likely to be a temporary deviation as during next verification period the calibration frequency of once in 3 years may be followed.

The second deviation is regarding the apportioning approach followed in the event when start or end date of JMR's do not match with the start or the end date of the monitoring period considered by the project proponent. The approach followed by the Project Proponent was already used during previous verification also and was deemed to be accepted. However, it was missed to be described in section of project description deviation during that time. So BVCH is of the opinion that this is a permanent deviation from the project description stated in the Approved VCS PD. The verifier has accepted this deviation for the reasons that there is no loss of accuracy as a result of the Apportioning approach followed and also the calculation of emission reductions would be more accurate.

The verification team is of the opinion therefore, that the deviations taken by Project proponent are acceptable and it will not affect computation of ER or impact the project activity performance.

3.4 Grouped Project

Not applicable as this is not a grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

It has been observed by the verification team that the project involves the installation of 30 numbers of 1650 kW WTGs of Vestas make in G.Usulampatti, Mottanoothu, Kothapatti, Shanmuga Sundara Puram & Marikundu Villages in Theni district in the state of Tamil Nadu, India. All the 30 WTG's are leading to a cumulative capacity of the project as 49.5 MW, which is same as described in the VCS Approved PD (Ref/3/). The entire power generated by the project activity is exported to the southern regional grid of India with a firm energy purchase agreement with the TANGEDCO erstwhile known as TNEB.

During the site visit and review of the monitoring report, the verification team observed that the entire electricity generated from all these Wind Turbine Generator's is supplied to the grid, which is in line with the VCS PD (/3/). The following table provides the details of implementation in detail.

Sr. No	HTSC No	No of WTG	Commissioning Date	Capacity (MW)
1	T-90, T-91, T-92, T-93, T-94, T-95, T-96, T-97, T-98, T-99, T-100, T-101, T-102, T-103, T-104, T-105, T-106, T-107, T-108, T-109,	20	25/06/2010	33

Sr. No	HTSC No	No of WTG	Commissioning Date	Capacity (MW)
2	T-113, T-114, T-115, T-116, T-117, T-118, T-119, T-120, T-121, T-122,	10	02/07/2010	16.5

All the WECs in Project activity are in continuous operation since commissioning of all the WEGs.

Power System: The electricity generated by the Project is delivered to the grid substation at Andipatti 110kV/33-22kV line and then delivered to Southern Regional Grid.

Metering System: A set of bidirectional (main and check) energy meters are installed near each WECs to account the electricity supplied to the grid. The main meter readings are recorded monthly by representatives of the respective electricity board (TANGEDCO) and Project participant's representative. Based on this monthly recording, the state electricity board issues the 'joint meter reading' (JMR) termed as Statement of Energy every month.

The verification team cross-checked all the Energy statements issued by TANGEDCO, invoices raised by Project Participant for corresponding months and confirms that the generated electricity has been sold to the grid and not used for any other purpose throughout the current monitoring period.

All meters are of bi-directional tri-vector type with an accuracy class of 0.5 except one set of meters are of 0.2 accuracy class installed at HTSC no 103.

Hence, the verification team confirms that the project activity has been implemented as per the description provided in the VCS-PD (Ref/3/). The equipment necessary for GHG emission reductions are in place.

The verification team confirms that no information about the project activity provided in the final monitoring report is different from that stated in the registered VCS-PD, and which could have caused or is likely to cause any increase in the estimates of emission reductions during the future monitoring periods.

Compliance of Monitoring with the Monitoring Plan

The monitoring plan is in accordance with the UNFCCC approved methodology applied by the registered VCS project activity viz; ACM 0002, version 13.

The primary monitoring in the project activity is that of the net electricity supplied to the state electricity grid. The verification team hereby confirms that the registered monitoring plan is in accordance with the UNFCCC approved methodology applied by the project activity. The deviation as described in above section 3.3 was taken by the Project Proponent for the current verification period.

Corresponding to the Section 4 of VCS version 03 date 19 October 2016 v3.6, Bureau Veritas Certification can confirm that the monitoring plan is in accordance with the approved methodology including applicable tool(s) applied by the Project.

Thus, the verification team confirms that the actual operation of the project activity is in line with the description in the VCS registered PD. There was no other data or information provided in the monitoring report that was different from the description stated in the CDM-registered PDD and VCS registered PD and having caused or likely to cause any increase in the estimates of emission reductions in the future monitoring periods.

The Project proponent has confirmed that there are no GHG emission reductions or removals generated by the project have been included in any emissions trading program or any other mechanism that includes GHG allowance trading. Also, have not claimed any other form of environmental credits nor has participated or was rejected under any other GHG programs. The Project proponent has also provided undertaking (/11/) to support the same in response verification team's clarification sought.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

Monitoring of the project activity parameters has been carried out in accordance with the monitoring plan, contained in the approved VCS PD.

The parameters required by the registered monitoring plan and the manner in which the verification team has verified the information flow (from data generation, aggregation, to recording, calculation and reporting for these parameters) including the values in the monitoring reports are described below:

- (a) **Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project activity during the period y ($EG_{PJ,y}$)** – This is a calculated value and it is a difference between the electricity exported to the grid and electricity imported from the grid. The net electricity supplied to the grid by the Project activity as presented in the monthly Energy statements (JMR) and it forms the basis for the calculation of the emission reduction from the project activity. This value was verified from TANGEDCO issued Monthly energy account statement. The Net electricity export values indicated in the TANGEDCO statement were further cross verified with the invoices raised by the project participant on state utility.
- (b) **$EF_{grid\ CM,y}$, Combined Margin (CM) CO₂ emission factor for Southern Grid** - The emission factor for the first crediting period of the Project activity has been determined ex-ante in the registered VCS PD. The emission factor value of 0.8970 tCO₂/MWh used in the monitoring report has been verified against the registered VCS PD and found it to be consistent.

All records like monthly JMR (Ref/9/), Invoice raised by the Project proponent (Ref/10/), Calibration certificates (Ref/12/), etc. related to the project activity operations are also well maintained by the Project Proponent. The data was found to be recorded diligently.

As per the methodology ACM0002 Version 13 and the registered VCS PD, the emission reductions for the Project are calculated as the baseline emissions minus the project emissions and leakage. Hence the emission reduction is determined by the following formula:

$$ER_y = BE_y - PE_y - LE_y$$

Where,

ER_y = Emission reductions

BE_y = Baseline emissions

PE_y = Project emissions

LE_y = Leakage Emissions

Baseline Emissions

It is calculated as the product of Net electricity supplied to the grid multiplied with Grid Emission Factor and is determined using the following formula:

$$BE_y = EG_y \times EF_y$$

$$= 276,350 \times 0.8970 = 247,885 \text{ tCO}_2\text{e}$$

Where,

EF_y = GHG emission factor of the southern Grid, 0.8970 tCO₂e/MWh

EG_y = Net electricity supplied to the grid (MWh)

Project Emissions

Project emission is considered to be nil which is in line with the applied methodology ACM 0002 version 13

Leakage Emissions

No leakage needs to be considered according to ACM0002 Version 13

Emission reductions

The emission reductions during the monitoring period from 04/10/2012 to 09/06/2016 are calculated as:

$$ER_y = BE_y - PE_y - LE_y$$

$$= 247,885 - 0 - 0$$

$$= 247,885 \text{ tCO}_2\text{e}$$

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

The verification team confirms that all parameters stated in the registered monitoring plan were monitored throughout the current verification period and data on the same was available.

The following actions were taken to ensure that the most conservative assumption theoretically possible has been made:

1. Ensured that the data that directly affect emission reductions are from official sources.
2. The values of net electricity exported to the grid as indicated in the JMR (/9/) were also cross-checked with the invoices raised by the Project proponent on TANGEDCO (/10/).
3. The registered monitoring plan indicates the frequency of accuracy testing/ calibration of the main and check meters as once in 3 years. The meters of the project activity are tested and sealed in the presence of TANGEDCO representative.
4. During this monitoring period, the installed measuring instruments have been operating well. However, there was delay in calibration of the meters during the current monitoring period. The details of the same are presented in the following table:

HTSC Loc No	Serial number	Accuracy	Calibration date	Validity	Actual Date of Calibration	Delay
T-90	TNB04329(MM) TNB04333(CM)	0.5S	13/03/2010	12/03/2013	08/09/2015	910 days
T-91	TNB02959 (MM) TNB02958 (CM)	0.5S	15/2/2010	14/02/2013	08/09/2015	936 days
T-92	TNB04384 (MM) TNB04383 (CM)	0.5S	01/06/2010	31/05/2013	08/09/2015	830 days
T-93	TNB04389 (MM) TNB04390 (CM)	0.5S	01/06/2010	31/05/2013	08/09/2015	830 days
T-94	TNB04385 (MM) TNB04386 (CM)	0.5S	01/06/2010	31/05/2013	09/09/2015	831 days
T-95	TNB02951 (MM) TNB04056 (CM)	0.5S	16/02/2010	15/02/2013	09/09/2015	936 days
			15/12/2009	14/12/2012		999 days
T-96	TNB04326(MM) TNB04327 (CM)	0.5S	25/05/2010	24/05/2013	09/09/2015	838 days
T-97	TNB04328 (MM) TNB04332 (CM)	0.5S	13/03/2010	12/03/2013	09/09/2015	911 days
T-98	TNB04387 (MM) TNB04388 (CM)	0.5S	01/06/2010	31/05/2013	09/09/2015	831 days
T-99	TNB04331 (MM) TNB04335 (CM)	0.5S	13/03/2010	12/03/2013	08/09/2015	910 days
T-100	TNB04077 (MM) TNB04063 (CM)	0.5S	06/01/2010	05/01/2013	08/09/2015	976 days
			31/10/2009	30/10/2012		1043 days
T-101	TNB04318 (MM) TNB04319 (CM)	0.5S	25/05/2010	24/05/2013	06/09/2015	835 days
T-102	TNB04047 (MM) TNB04062 (CM)	0.5S	06/01/2010	05/01/2013	07/09/2015	975 days
			31/10/2009	30/10/2012		1042 days
T-103	TNB02950 (MM) TNB04055 (CM)	0.5S	17/02/2010	16/02/2013	07/09/2015	933 days
			15/12/2009	14/12/2012		997 days

HTSC Loc No	Serial number	Accuracy	Calibration date	Validity	Actual Date of Calibration	Delay
	HT2160431(MM) HT2160432(CM)	0.2S	03/03/2016	02/03/2019 ¹	NA	NA
T-104	TNB02947 (MM) TNB04091 (CM)	0.5S	17/02/2010	16/02/2013	06/09/2015	932 days
			12/11/2009	11/11/2012		1029 days
T-105	TNB 04420 (MM) TNB 04448 (CM)	0.5S	03/06/2010	02/06/2013	07/09/2015	827 days
T-106	TNB02952(MM) TNB04057 (CM)	0.5S	16/02/2010	25/06/2013	06/09/2015	803 days
			15/12/2009	14/12/2012		996 days
T-107	TNB04320 (MM) TNB04321 (CM)	0.5S	25/05/2010	24/05/2013	07/09/2015	836 days
T-108	TNB02949 (MM)	0.5S	17/02/2010	16/02/2013	07/09/2015	933 days
	TNB04054 (CM)		15/12/2009	14/12/2012		997 days
T-109	TNB04325 (MM) TNB04324 (CM)	0.5S	25/05/2010	24/05/2013	07/09/2015	836 days
T-113	TNB 4330 (MM) TNB04334 (CM)	0.5S	13/03/2010	12/03/2013	08/09/2015	910 days
T-114	TNB04417 (MM) TNB04416 (CM)	0.5S	03/06/2010	02/06/2013	08/09/2015	828 days
T-115	TNB04391 (MM)	0.5S	01/06/2010	31/05/2013	09/09/2015	831 days
	TNB04392 (CM)		03/06/2010	02/06/2013		829 days
T-116	TNB04418 (MM) TNB04419(CM)	0.5S	03/06/2010	02/06/2013	07/09/2015	827 days
T-117	TNB04058 (MM)	0.5S	15/12/2009	14/12/2012	07/09/2015	997 days
	TNB02953 (CM)		16/02/2010	15/02/2013		934 days
T-118	TNB02948 (MM)	0.5S	17/02/2010	16/02/2013	08/09/2015	934 days
	TNB04092 (CM)		12/11/2009	11/11/2012		1031 days
T-119	TNB04322 (MM) TNB04323 (CM)	0.5S	25/05/2010	24/05/2013	07/09/2015	836 days
T-120	TNB02954 (MM) TNB02955 (CM)	0.5S	16/02/2010	15/02/2013	06/09/2015	933 days
T-121	TNB04368 (MM) TNB04369 (CM)	0.5S	03/06/2010	02/06/2013	06/09/2015	826 days
T-122	TNB02956 (MM) TNB02957 (CM)	0.5S	15/02/2010	14/02/2013	06/09/2015	934 days

As evident from above meter testing dates, in continuation with the previous accuracy testing date in the year 2009-10 the next scheduled date of testing was in the year 2012-13, whereas actual meter testing was conducted in the month of September 2015. Thus, the frequency of calibration of once in 3 years was not followed and there was delay in the calibration of all meters during current verification period. Further, delay Calibration reports indicate that all the meters were within their permissible limits of error. Hence, in line with paragraph 395 and 396 of CDM VVS version 9, Project proponent has applied maximum error of 0.5% as applicable on the metered readings for entire verification period between October 2012 - September 2015. The approach followed by Project participant will lead to conservative calculation of VERs.

¹ Post current verification period

Verification team also noted that the energy meters and it's the frequency of calibration are not in jurisdiction of Project proponent or its representatives, but is with TANGEDCO. Hence Project participant do not have any role to play in the same.

Further, verification team also noted that in 01 HTSC location, there was a meter change in the year 2016. The meter change document was referred by the verification team and it confirms that the meters were working fine, but due to failure in HG Fuse the meters were declared defective and replaced subsequently.

In line with paragraph 3.6.2 of VCS Standard version 3, dated 19 October 2016 v3.6, verification team confirms that the deviation is appropriately described in the relevant section. Hence, verification team was able to conclude that although there was a deviation taken during the current verification period, the project remains in compliance with the VCS rules.

5. There were no major shutdown and/or emergencies situations during the current verification period. The verification team observed that there is no FAR raised during the validation of the project activity.

All the data was available and monitored in accordance with the registered monitoring plan. There is no instance of data not being available during the current verification period. The action taken to ensure that the most conservative assumption theoretically possible has been made by the project proponent was to ensure that the data that directly affect emission reductions are taken from official sources.

Appropriate methods and formulae for calculating baseline emissions, have been followed. There are no project emissions to be considered as per the applied methodology and also since there is no transfer of equipment involved, leakage also do not apply. Hence, the verification team confirms that the emission reductions claimed during the current monitoring period are conservative and reliable.

4.4 Non-Permanence Risk Analysis

Not Applicable

5 SAFEGUARDS

5.1 No Net Harm

The project being Wind Power Project do not possess any kind of negative environmental and socio economic impacts.

5.2 Local Stakeholder Consultation

Not relevant in the context of current verification.

6 VERIFICATION CONCLUSION

The verification scope is an independent and objective review of the VCS Project description, the project's baseline study and monitoring plan and other relevant documents. The review is to verify the implementation of monitoring plan as defined in registered VCS PD. The period for verification is from 04/10/2012 to 09/06/2016 (inclusive of both the days).

The verification of the monitored data indicates the emission reductions and the amount for emission reductions for the monitoring period are provided below:

Monitoring Period		Total Emission Reductions Achieved (tCO ₂ e)
From	To	
04/10/2012	31/12/2012	6,554
01/01/2013	31/12/2013	84,909
01/01/2014	31/12/2014	82,326
01/01/2015	31/12/2015	58,261
01/01/2016	09/06/2016	15,835

The calculations of emission reductions are found to be correct. The baseline for the Southern regional grid has been taken for arriving at baseline emissions. The grid emission factor of 0.8970 tCO₂e/MWh for Southern regional grid was found to be correct.

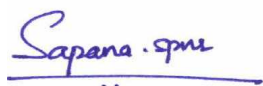
Appropriate procedures for maintaining the confidentiality and safe custody of the validation or verification documentation and for retaining them for a period sufficient to meet the needs of the client, the responsible parties, the GHG programmes to which they subscribe, and in accordance with legal and professional requirements of record retention have been established.

The verification team confirms that the project is implemented as planned and described in the approved VCS-PD. The monitoring mechanism is effective and reliable. The reported data are accurate and correct based on all the records provided to the verification team during the verification as provided in annexure-II. The installed equipment being essential for generating the emission reductions run reliably and the measuring equipment/instruments are well within the frequency of calibration.

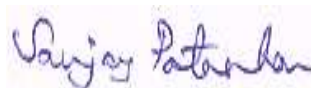
Verification period: From *04 October 2012* to *09 June 2016*

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

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2012	6,554	0	0	6,554
2013	84,909	0	0	84,909
2014	82,326	0	0	82,326
2015	58,261	0	0	58,261
2016	15,835	0	0	15,835
Total	247,885.00	0	0	247,885.00



Ms. Sapana Pednekar
(Team Leader)
08/11/2016
Mumbai, India



Mr. Sanjay Patankar
(Internal Technical Review)
08/11/2016
Mumbai, India

APPENDIX I: DETAILS OF CORRECTIVE ACTIONS AND CLARIFICATION REQUESTED

Draft report clarifications and corrective action requests by validation team	Reference/ Section	Summary of project owner response	Validation team conclusion
CL 1 : In section 1.9, the Project Participant claims that although the project activity is registered under CDM, the carbon credits generated from the project activity will not be claimed under 2 GHG programmes for same monitoring period. However, Project Proponent to provide an authentic declaration for the same to substantiate the claim for the current monitoring period (04.10.2012 - 09.06.2016).	1.9 MR	Declaration letter, by the PP is provided which states that, <i>“the carbon credits generated from the project activity will not be claimed under 2 GHG programmes for same monitoring period 04.10.2012 - 09.06.2016”</i> DOE is requested to kindly refer the attached declaration letter.	The undertaking provided by the Project Participant dated 25/10/2016 confirms that emission reductions under current monitoring (4.10.2012 – 09.06.2016) period will not be claimed under any other GHG program other than VCS. Based on the valid declaration submitted CL 01 is vacated.
CL 2 : 1) The JMR dates and the current monitoring period start date are not same, so Project Proponent has followed apportioning procedure on pro-rata basis to calculate Emission reductions for the period of the mismatch. However, VCS Registered PD does not describe this procedure. In view of same, Project Proponent to clarify the reason for not considering this to be a deviation from VCS approved project description. 2) During current verification period, it is observed that there is delay in the calibration of meters beyond stipulated frequency of 3 years in line with the registered PD. As per the requirement of VCS Standard, is this delay in calibration not to be considered as project description deviation. Project Proponent to clarify.	2.2.2 MR	1. Procedures followed for apportioning of mismatch period is now updated in <i>Section 2.2.2 project description deviation.</i> Further section 3.3 of the MR, elaborates the approach to be followed for apportioning emission reduction in the event of mismatch. 2 Delay in calibration of meters beyond stipulated frequency of once in 3 years (mentioned in line with the registered PD) is now considered in section 2.2.2 of the monitoring report. Further, in line with para 395 and 396 of CDM validation and verification standard (VVS), EB 65 A04 Version 09, the maximum permissible error has been applied conservatively on	1. The revised MR now describes the deviation for the apportioning procedure followed during the mismatch of the dates at the start or the end of the monitoring period. The description provided in section 2.2.2 and 3.3 is acceptable. Hence, Point 01 is closed. 2. The delay in calibration of meters during the current verification period was considered as the deviation from the defined frequency of meters to be once in 3 years in the approved project description. The same has been also described in the revised MR under relevant section of 2.2.2

Draft report clarifications and corrective action requests by validation team	Reference/ Section	Summary of project owner response	Validation team conclusion
		electricity generation values falling beyond the validity period of calibration report.	and was found to be acceptable. Hence, point 2 is closed. Based on the appropriate revisions done by the project proponent, CL 02 was vacated.
CL 3 : During site visit, it was observed that main and check meters serial no's at HTSC 103 do not match with the details in the MR, provided to the verification team. On inquiry at the site, the verification team was informed that the meters were replaced in the year 2016. Project Proponent to justify the same with the meter change details in MR and also substantiate it with authentic meter change documents.	Section 3.3 of MR, Calibration details	In line to the onsite observations, meter replacement certificate is been provided along with this submission. This change in main and check meter at HTSC 103 is also updated in the revised monitoring report.	The Project Proponent has provided the meter change documents issued by TANGEDCO dated 10/03/2016 which confirms that the set of main and check meters at the HTSC 103 were replaced on 03.03.2016. The reason for replacement stated in the document is 'Failure in HG Fuse and hence, metering set was declared defective'. The new set of meters are of 0.2 accuracy class which is more accurate as compared to previous meter's accuracy class of 0.5. The justification provided by the Project Proponent is found to be acceptable. Hence, CL3 is closed.
CAR 1 In the table of calibration details of the meters, the dates of 1 st Calibration do not match with the Corresponding Calibration Certificates for Loc T-91, T-92, T-95, T-96, T-99, T-103, T-104, T-106, T-108, T-109, T-114, T-118.	Section 3.3 of MR, Calibration details	Changes in line to the calibration certificates for year 2010 is been made in the revised MR. However for Loc-T 99 values are in line with the calibration certificates.	The correct dates for the calibration are now provided in MR and are in line with the calibration certificates issued by the TANGEDCO. Hence, CAR 01 is closed.
CL 4 :	Section 3.3	1. Calibration frequency for the energy meters are once in three years thus	1. In the events of the delay in the

Draft report clarifications and corrective action requests by validation team	Reference/ Section	Summary of project owner response	Validation team conclusion
1. During review of Calibration Certificates, it was observed that the calibration/meter testing frequency of once in 3 years was not followed during the current monitoring period. The monitoring report version 1 is not found to account this delay in the calibration of meters in the description under section 3.3. 2. Further in the ER Sheet, this delay was not found to be applied correctly to the months of actual delay. 3. It is not clear to the verification team why error of 1% is applied on the readings when the accuracy class of the meters is 0.5 and the delayed calibration certificates also confirms that meters were within permissible limit of error.	MR, ER Sheet-	correction factor is applied to the generation values beyond calibration validity due date. This delay in the calibration of meters is updated under section 3.3 of the revised monitoring report. 2. In the ER Sheet, this delay is now applied correctly to the months of actual delay 3. Application of error factor to its maximum permissible limit of 0.5% is been applied for the delayed period. DOE is requested to refer revised version of ER sheet for the same.	calibration of the meters beyond the stipulated period of 3 years, the Project Proponent has applied maximum permissible error equivalent to the accuracy class of meters, as the delayed calibration certificates confirmed the meters to be with it permissible limits of error. The approach followed by the Project Proponent is conservative and is found to be acceptable. Hence, point 01 is closed. 2. The error is now correctly applied to all the JMR months reading for the period when the meters were not in the validity of calibration. Hence, point 02 is closed. 3. The correct error factor equivalent to the accuracy class of meters are now applied to the JMR readings. Hence, point 3 is closed. Based on the satisfactory response provided by the project proponent, CL04 is vacated.
CAR 2 Net Export values for following HTSC No's do not match with the corresponding	ER Sheet	Net Export values for following HTSC No's is now consistent with the JMR/Invoices • 09-Apr-13 to 09-May-13 for T-90 • 09-Sep-15 to 09-Oct-15 for T-91	All relevant values are revised correctly and found to be matching with the corresponding JMR and

Draft report clarifications and corrective action requests by validation team	Reference/ Section	Summary of project owner response	Validation team conclusion						
months JMR/ Invoice. 09-Apr-13 to 09-May-13 for T-90 09-Sep-15 to 09-Oct-15 for T-91 09-Mar-16 to 09-Apr-16 for T-95 09-Dec-15 to 09-Jan-16 for T-96 09-Jun-15 to 09-Jul-15 for T-101 09-Jan-13 to 09-Feb-13 for T-103 09-Jul-15 to 09-Aug-15 for T-105, T-116 09-Sep-15 to 09-Oct-15 for T-109 09-May-15 to 09-Jun-15 for T-113 09-Apr-16 to 09-May-16 for T-116, T-118		09-Mar-16 to 09-Apr-16 for T-95 09-Dec-15 to 09-Jan-16 for T-96 09-Jun-15 to 09-Jul-15 for T-101 09-Jan-13 to 09-Feb-13 for T-103 09-Jul-15 to 09-Aug-15 for T-105, T-116 09-Sep-15 to 09-Oct-15 for T-109 09-May-15 to 09-Jun-15 for T-113 09-Apr-16 to 09-May-16 for T-116, T-118	Invoices. Hence, CAR 2 is closed.						
CL 5 : 1. JMR and Invoice for 09-May-16 to 09-Jun-16 are not provided to the verification team. 2. It is not evident why there were 2 JMRs during following months: <table><tr><td>09-Aug-15</td><td>09-Sep-15</td><td>T-90, 91, 92, 93, 99, 100 – 109, 113, 114, 116, 117, 119, 120, 121, 122</td></tr><tr><td>09-Feb-16</td><td>09-Mar-16</td><td>T-103</td></tr></table>	09-Aug-15	09-Sep-15	T-90, 91, 92, 93, 99, 100 – 109, 113, 114, 116, 117, 119, 120, 121, 122	09-Feb-16	09-Mar-16	T-103	ER Sheet	i. JMR and Invoice for 09-May-16 to 09-Jun-16 are now provided to the verification team. ii. Readings for the period 09-Aug-2015 to 09-Sep-2015 and were taken in two parts i.e. 09-Aug-2015 to 08-Spt-2015 and 08-Sept-2015 to 09-Sep-2015, this due to calibration of energy meters carried out for the period between 6th to 9th of September 2015. However, billing cycle as mentioned in the two JMR's is uninterrupted and continuous. Further for the T-103, old main and check meters were replaced with the paid of new main and check meters on 03-Mar-16, thus readings were taken in two parts i.e. from 09-Feb-16 to 03-Mar-	1. The JMR and corresponding Invoices for 09-May-16 to 09-Jun-16 are now provided. Hence, point 01 is closed. 2. The justification provided is found to acceptable. Hence, point 02 is closed. Based on the satisfactory response provided CL 05 is vacated.
09-Aug-15	09-Sep-15	T-90, 91, 92, 93, 99, 100 – 109, 113, 114, 116, 117, 119, 120, 121, 122							
09-Feb-16	09-Mar-16	T-103							

Draft report clarifications and corrective action requests by validation team	Reference/ Section	Summary of project owner response			Validation team conclusion
		2016 and 03-Mar-16 to 09-Mar-16.			
		09-Aug-15	09-Sep-15	T-90, 91, 92, 93, 99, 100 – 109, 113, 114, 116, 117, 119, 120, 121, 122	
		09-Feb-16	09-Mar-16	T-103	

ANNEXURE II: DOCUMENTS REFERRED DURING VERIFICATION OF THE PROJECT ACTIVITY

- /1/ VCS Monitoring Report, version 01, dated 25/08/2016
- /2/ Final VCS MR version 4 dated 08/11/2016
- /3/ Approved VCS PD version 03 dated 21/06/2012
- /4/ Proof of registration as CDM Project activity ref no 7416
(<http://cdm.unfccc.int/Projects/DB/RWTUV1348485861.38/view>)
- /5/ VCS Monitoring report template Current Version: v3.4 dated on 19 October 2016
- /6/ Verified Carbon Standard Version 3, v3.6 dated 19 October 2016
- /7/ VCS Program Guide Version 3 v3.6 dated 19 October 2016
- /8/ Emission Reduction Calculation Sheet
- /9/ Monthly State Energy Statements (JMR) issued by TNEB for the current verification period
- /10/ Copy of all invoices raised to TANGEDCO by Project proponent for net electricity exported to the grid for the current verification period
- /11/ Declaration from CLP Wind Farms (Theni-Project II) Private Limited that the project shall not claim credits for the same period under any other GHG program dated 25/10/2016
- /12/ Calibration certificates issued by TANGEDCO for the current monitoring period and meter replacement report

ANNEXURE III: LIST OF PERSONS INTERVIEWED

List persons interviewed during the verification process or persons that contributed with other information that are not included in the documents listed above.

- /1/ Mr. Dipjay Sanchania CLP Wind Farms (Theni Project II) Private Limited
- /2/ Mr. Sandip Saha CLP Wind Farms (Theni Project II) Private Limited
- /3/ Mr. G Bharatidasan Senior Manager- Operation, CLP Wind Farms (Theni Project II) Private Limited
- /4/ Mr. A Tlavarajan Senior Engineer, Vestas Wind Technology India Private Limited
- /5/ Mr. N Kannan Engineer, Vestas Wind Technology India Private Limited

ANNEXURE IV: Curricula Vitae of the Verification Team Members**Ms. Sapana Pednekar - Team Leader****Bureau Veritas Certification, Lead Verifier - Climate change**

She is a Post Graduate in Environmental Science from University of Pune, India and holds a PGDBA in Financial Management from Welingkars School of Management. She has total Industrial work experience of 10 years in the field of environmental studies of which more than 8 years' experience is in the field of CDM and VCS. She is working in Bureau Veritas Certification (India) Pvt. Ltd. for last more than 6 years and has undergone training related to Clean Development Mechanism and is currently involved in validation and verification of more than 60 CDM/ VCS project activities. She has undergone and successfully completed ISO 14001:2004 standard, ISO 50001:2011 standard Lead Auditor Courses and ISO 14064:2006 Standard Lead verifier course.

Sanjay Patankar, Internal Technical Reviewer**Bureau Veritas Certification, Lead verifier – Climate Change**

Educational qualifications: B.E. (Mech.) M.E. (Mech.)

He has over 20 years of experience in engineering manufacturing industry covering various functions like enterprise management, product design, engineering, tool & die design, improvements in the production shop, quality assurance & control and systems planning and implementation, including ISO 9001 based quality management systems. Working for the last 9 years in Bureau Veritas Certification (India) Pvt. Ltd. as Lead Auditor for ISO 9001, 14001 and OHSAS 18001 standards/specifications.