WIND POWER PROJECT AT THENI BY POWERICA LIMITED

Document Prepared By (ATUL TAKARKHEDE - LEAD AUDITOR/ TECHNICAL EXPERT)

LGAI Technological Center S.A.

Ctra. Acceso a la facultad de Medicina, s/n, Campus UAB

E – 08193 Bellaterra (Barcelona) – Spain

Tel: +34 935 672 008

Fax: +34 935 672 001

www.appluscertification.com

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Prepared By	LGAI Technological Center, S.A. (Applus+ Certification)
Contact	Campus UAB – Ronda de la Font del Carme, s/n 08193 Bellaterra – Barcelona (Spain) Tel.:+34 93 567 20 08 Fax.:+34 93 567 20 01 www.appluscertification.com agustin.calle@applus.com carla.debat@applus.com
Approved By	Juan Sendin Caballero, Applus+ Certification B.U. Managing Director

Work Carried Out By	ATUL TAKARKHEDE -Lead Auditor

Summary:

Validation purpose: The main purpose of this project activity is to generate clean form of electricity through renewable energy sources. The project activity helps to reduce the supply demand gap in the state and also helps in contributing to the sustainable development by using Wind energy as the source of power generation and reduction of GHG Emissions. The technology employed by the project activity converts kinetic energy in wind to mechanical energy and mechanical energy to electrical energy using wind turbine generators (WTGs). The project activity involves a total installation of 6 Wind Turbine Generators (WTG) of total generating capacity of 9.9 MW (6 units of Vestas make V82 WTG). The WTG units are installed in Theni district of the state of Tamilnadu.

The project is registered under CDM mechanism (reference number: 4572[1]). The present validation (gap validation) is under VCS mechanism and assessment of clause 1.1, 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, 1.13 and 2.6 of the VCS Project Description Template. The same is in line with Para 3.11.10 of VCS standard version 3.7.

A risk based approach has been followed to perform this validation activity. In the course of gap validation, 02 Corrective Action request (CAR), 00 Clarification Requests (CLs) and 00 Forward action request action were raised and successfully closed. The review of the project description and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and PP have provided Applus+ Certification with sufficient evidence to verify the fulfilment of the stated criteria of VCS.

Verification purpose: The project activity involves a total installation of 6 Wind Turbine Generators (WTG) of total generating capacity of 9.9 MW (6 units of Vestas make V82 WTG). The WTG units are installed in Theni district of the state of Tamilnadu. The project aims at providing electricity to the state of Tamilnadu by effective utilization of renewable resources. The electricity generated from the project activity is supplied to Southern regional grid of India (Now Indian Electricity Grid). This is because the project activity qualifies as a CDM/VCS project as it would be feeding clean power to the electricity grid thereby helping in significant reduction of GHG emissions.

Wind turbines produce electricity by using the natural power of wind to drive a generator. Wind has considerable amount of kinetic energy when blowing at high speeds. When this kinetic energy passes through the blades of the wind turbines, it is converted into mechanical energy and rotates the wind blades. When the wind blades rotate, the connected generator also rotates, thereby producing electricity.

The project uses Vestas technology. The total emission reductions for the current monitoring period i.e. 11/12/2012 to 10/09/2018 are 98,590 tCO_{2e}.

[1] http://cdm.unfccc.int/Projects/DB/LRQA%20Ltd1300097036.88/view

This is the first monitoring period under VCS and covers the activity from 11/12/2012 to 10/09/2018 (inclusive of both dates). The project is registered under Clean Development Mechanism (CDM) of UNFCCC with 7 years crediting period (Renewable) (Reference No: 4572) on 17/03/2011[2]. The Crediting period of the project under CDM started on 01/05/2011 and ended on 30/04/2018. The project has begun generating GHG emission reductions from commissioning. The crediting period for VCS will start from 13/09/2010 to 12/09/2020. CERs from 01/05/2011 to 10/12/2012 has been already issued and details are available on UNFCCC webpage[3]. The project proponent will also not claim GHG emission reductions under two schemes for the same period. The GHG credits from 11/12/2012 to 10/09/2018 will be claimed under VCS only. An undertaking from the project participant confirms that project will not claim any other scheme benefits for the concerned monitoring period.

A risk-based approach has been followed to perform this verification activity. In the course of verification, 04 Corrective Action requests (CAR), 00 Clarification Requests (CLs) and 00 Forward action requests (FARs) were raised and successfully closed. The review of the Monitoring report and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and PP have provided DOE with sufficient evidence to verify the fulfilment of the stated criteria of VCS.

LGAI Technological Center S.A. (Applus+ Certification) (Hereafter referred as Applus+ Certification) has been appointed by "Powerica Limited" to perform the 1st periodic verification of the "Wind Power Project at Theni by Powerica Limited" under VCS standard and guideline version 3.7. The objective of this verification activity is to have an independent third party for the assessment of the project design, Monitoring report and Final Verification report and to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements. In particular;

- the project's baseline is assessed against "AMS-I.D. Version 16"
- the project's monitoring plan is assessed against "AMS-I.D. Version 16"
- the projects compliance with, the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS guideline and standard version 3.7
- CDM Validation and Verification Standard version 02 for the project activities
- CDM Project Standard version 02 for the project activities
- CDM Project Cycle Procedure version 02 for the project activities
- VCS standard v3.7

[2] https://cdm.unfccc.int/Projects/DB/LRQA%20Ltd1300097036.88/view

[3] VER for the period 13/09/2010 to 30/04/2011 is unclaimed till date as CDM crediting period starts from 01/05/2011 and monitoring period for 1st VCS verification is chosen by PP from 11/12/2012 to 10/09/2018.

- VCS program guideline v3.7

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 verified emission reductions (VERs).

The scope of the verification is the independent and objective review of the Monitoring report (MR). The MR is reviewed against the relevant criteria (see above) and decisions by the CDM Executive Board and VCS executive board, including the approved baseline and monitoring methodology. The verification was based on the guidance given in the CDM Validation and Verification Standard version 02 for the project activity, review against registered PDD and Final Validation report, CDM Project Standard version 02 for the project activities, CDM Project Cycle Procedure version 02 for the project activities and VCS program guideline and standard version 3.7.

The assessment team has employed a risk based approach to assess the completeness and accuracy of the claims and conservativeness of the assumptions in the MR. The main focus of the assessment team is to identify the significant risks for the project implementation and the generation of VERs. The verification is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the monitoring report.

The only purpose of the verification is its usage during the issuance process as part of the VCS project cycle. Therefore, LGAI Technological Center S.A. (Applus+ Certification) can't be held liable by any party for decisions made or not made based on the verification opinion, which will go beyond that purpose.

The verification has been planned and organized to achieve a Reasonable Level of assurance as per the requirement of VCS. No sampling procedure applied for site visit or document verifications. The entire documents checked/WTGs verification conducted to arrive at positive verification conclusions.

Contents

1 INTRODUCTION

1.1 Objective

LGAI Technological Center S.A. (Applus+ Certification) (Hereafter referred as Applus+ Certification) has been appointed by "Powerica Limited" to perform the 1st periodic verification of the "Wind Power Project at Theni by Powerica Limited" under VCS standard and guideline version 3.7. The objective of this verification activity is to have an independent third party for the assessment of the project design, Monitoring report and Final Verification report and to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements. In particular;

- the project's baseline is assessed against "AMS-I.D. Version 16"
- the project's monitoring plan is assessed against "AMS-I.D. Version 16"
- the projects compliance with, the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS guideline and standard version 3.7
- CDM Validation and Verification Standard version 02 for the project activities
- CDM Project Standard version 02 for the project activities
- CDM Project Cycle Procedure version 02 for the project activities
- VCS standard v3.7
- VCS program guideline v3.7

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 verified emission reductions (VERs).

1.2 Scope and Criteria

The scope of the verification is the independent and objective review of the Monitoring report (MR). The MR is reviewed against the relevant criteria (see 1.1) and decisions by the CDM Executive Board and VCS executive board, including the approved baseline and monitoring methodology. The verification was based on the guidance given in the CDM Validation and Verification Standard version 02 for the project activities, review against registered PD and Final Validation report, CDM Project Standard version 02 for the project activities, CDM Project Cycle Procedure version 02 for the project activities and VCS program guideline and standard version 3.7.

The assessment team has employed a risk based approach to assess the completeness and accuracy of the claims and conservativeness of the assumptions in the MR. The main focus of the assessment team is to identify the significant risks for the project implementation and the generation of VERs. The verification is not meant to provide any consulting towards the project participants. However, stated

requests for clarifications and/or corrective actions may have provided input for improvement of the monitoring report combined.

The only purpose of the verification is its usage during the issuance process as part of the VCS project cycle. Therefore, LGAI Technological Center S.A. (Applus+ Certification) can't be held liable by any party for decisions made or not made based on the verification opinion, which will go beyond that purpose.

1.3 Level of Assurance

The verification has been planned and organized to achieve a Reasonable Level of assurance as per the requirement of VCS. No sampling procedure applied for site visit or document verifications. The entire documents checked/WTGs verification conducted to arrive at positive verification conclusions.

1.4 Summary Description of the Project

The project activity involves a total installation of 6 Wind Turbine Generators (WTG) of total generating capacity of 9.9 MW (6 units of Vestas make V82 WTG). The WTG units are installed in Theni district of the state of Tamilnadu. The project aims at providing electricity to the state of Tamilnadu by effective utilization of renewable resources. The electricity generated from the project activity is supplied to Southern regional grid of India (Now Indian Electricity Grid). This is because the project activity qualifies as a CDM/VCS project as it would be feeding clean power to the electricity grid thereby helping in significant reduction of GHG emissions.

The timeline for Commission of the project activity is also checked by the assessment team. Assessment team checked the Commission of all the WTGs via the commissioning Certificates and found correct. The project is implemented as per the description in the registered PD. No event observed during the current monitoring period which can alter or deviate from the methodology requirement. The details are as below:

Sl. No	WTG	HTSC No.	Capacity of WTG (MW)	Commissioning Date
1	TGU28	T - 139	1.65	13/09/2010
2	TM721	T - 141	1.65	13/09/2010
3	TSSP158	T - 142	1.65	13/09/2010
4	TSSP174	T - 143	1.65	13/09/2010
5	TSSP1255	T - 144	1.65	13/09/2010
6	TM41	T-145	1.65	17/09/2010

There was no activity at the site prior to implementation of the project activity (Greenfield). The electricity generated by the project is exported to the Indian grid. The project activity will therefore displace an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid. Since Wind power is Greenhouse Gas (GHG) emissions free, the power generated will prevent the anthropogenic gas emissions generated by fossil fuel based thermal power stations comprising coal, diesel, furnace oil and gas.

2 VERIFICATION PROCESS

2.1 Method and Criteria

Gap Validation and Verification Scope: The scope is defined as an independent and objective review of the project design document (PD: relevant clause: 1.1, 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, 1.13 and 2.6) and Monitoring report (MR). The PD and MR is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board and VCS standard and guideline version 3.5, including the approved baseline and monitoring methodology AMS-I.D. Version 16. The validation and verification based on the requirements in the Validation and Verification Standard (VVS version 02 of the project activities), project standard version 02 of the project activities, project cycle procedure version 02 of the project activities and VCS guideline and standard version 3.7.

The gap validation and verification are not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the Monitoring report/VCS PD.

In line with Guidelines for Application of materiality in verifications, the verification team has conducted a complete verification of all the information presented in the monitoring report and data monitored as presented in the emission reduction calculation spreadsheet. It invoices follows the paper trail back to the raw data such as meter reading records and invoices. There are no material errors, overestimation of ER, omission or misstatement. No sampling is used as the verification team has visited Wind site along with the substations. The verification team has reviewed all the documents like commissioning certificates, JMR, invoices etc.

Gap Validation and Verification Process: The project assessment is based on the “Clean Development Mechanism Validation and Verification Standard” version 02 for the project activity and “VCS standard version 3.7” and “VCS program guide version 3.7” and is conducted using standard auditing techniques to assess the correctness of the information provided by the project participants. Before the assessment begins, members of the team covering the technical scope(s), sectoral scope(s), and relevant host country experience for evaluating the VCS project activity are appointed.

Once the project is received by the assessment team, the members of the assessment team carried out:

1. A desk review of project design documentation (clause: 1.1, 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, 1.13 and 2.6 of VCS PD template) and the Monitoring report;

2. Follow-up interviews with project participant;

3. The resolution of outstanding issues and the issuance of the final verification report and opinion.

The prepared verification report and other supporting documents then undergo an internal quality control at the HQ (Accredited office) before being submitted to the VCS executive board.

In order to ensure transparency, assumptions must be clear and stated explicitly and background material must also be referenced. Applus+ Certification has developed a specific checklist customized for the project. The checklist demonstrates, in a transparent manner, the project criteria (requirements),

discussion on each criterion by the assessment team, and the results from validating the identified criteria.

Appointment of the assessment team

According to the sectoral scope / technical area and experience in the sectoral or national business environment, Applus+ Certification has composed a project assessment team in accordance with the appointment rules in the internal Quality Management System of Applus+ Certification.

The composition of audit team shall be approved by the Applus+ Certification ensuring that the required skills are covered by the team.

The four qualification levels for team members that are assigned by formal appointment rules are as pres ented below:

●Lead Auditor (LA).

●Auditor (A) / Auditor in Training (AiT).

●Technical Expert (TE).

●Technical Reviewer (TR).

The sectoral scope / technical area knowledge linked to the applied methodology/ies shall be covered by the assessment team.

Name	Role	SS Coverage	TA Coverage	Financial aspect	Host country experience
Dr. Atul Takarkhede	LA/TE	YES	YES	NA	YES
Mr. Denny Xue	TR	YES	YES	NA	NA

The detail regarding the assessment team is provided below in this report as Appendix 3

Document review

The VCS PD version 01 and Monitoring report version 01 submitted by the PP was reviewed against the approved methodology, CDM registered PDD, CDM final validation report and other relevant criteria to verify the correctness, credibility, and interpretation of the presented information. Furthermore, a cross-check between information provided and information from other sources has been done. A complete list of all documents and evidence material reviewed is included in this report below in appendix 1.

Follow-up interviews

A site visit is conducted by Applus+ Certification. Audit team performed interviews, telephone conferences, and physical site inspection with project stakeholders to confirm selected information and to resolve issues identified in the document review. The detail is provided in this report.

Resolution of Clarification and Corrective Action Request

The objective of this phase of the Gap Validation and Verification was to resolve the requests for corrective actions and clarification and any other outstanding issues which need to be clarified for Applus+ Certification positive conclusion on the Monitoring report/VCS PD. The Corrective Action Requests and Clarification Requests raised by Applus+ Certification were resolved during communications between the Client and Applus+ Certification to guarantee the transparency of the verification process, the concerns raised, and responses given are summarized below in the appendix 2.

The final MR Version 02 and VCS PD version 02 submitted by PP on 29/12/2018 serves as the basis for the final assessment presented. Additional changes to the project during the gap validation and verification process are not considered to be significant with respect to the main CDM/VCS objectives. The two CDM/VCS main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

Internal quality control

As final step of a gap Validation and verification of the final documentation including the Gap Validation and verification report and the checklist have to undergo an internal quality control by the technical review committee, i.e. each report has to be finally approved either by the head of the technical review committee or the deputy. In case one of these two persons is part of the assessment team approval can only be given by the other one to avoid any conflict of Interest.

After confirmation of the PP the positive verification opinion and relevant documents are submitted to the VCS board through the VCS web-platform

2.2 Document Review

The details of the document observed during the verification process are listed below in Appendix 1 of this report.

2.3 Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Gupta	Shri. Pradeep	PP Representative	03/12/2018 - 04/12/2018	Implementation of the project and monitoring. Baseline emission calculation, achieved emission reduction for the monitoring period, monitoring process followed onsite	Dr. Atul Takarkhede
2	Ezhil	-	Villager		Local Stakeholder Consultations	
3	K.V.	Ajay	Villager		Local Stakeholder Consultations	
4	Dutta	Bhaskar	Consultant		Baseline emission, Emission reduction calculation etc.	

2.4 Site Inspections

Duration of on-site inspection: 03/12/2018-04/12/2018				
No.	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.	Assessment team checked the implementation of the project, Baseline emission, Emission reduction calculation, technical description of the project and Monitoring. Assessment team also checked that whether the monitoring plan as described in the VCS PD is actually practised onsite. Also assessment team checked any change in host country criteria which may affect the baseline of the project activity. Assessment team also had a discussion with Local stakeholders and checked grievance register placed onsite as per the continuous improvement measure of PP for the Local villagers.	Andipatti District: Theni State: Tamilnadu, India	03/12/2018-04/12/2018	Dr. Atul Takarkhede

2.5 Resolution of Findings

The objective of this phase of the Gap Validation and Verification was to resolve the requests for corrective actions and clarification and any other outstanding issues from validation which need to be clarified for Applus+ Certification's positive conclusion on the Monitoring report. The Corrective Action Requests and Clarification Requests raised by Applus+ Certification were resolved during communications between the Client and Applus+ Certification to guarantee the transparency of the verification process, the concerns raised, and responses given are summarized below in the appendix 2.

The final MR Version 02 and VCS PD version 02 submitted by PP on 29/12/2018 serves as the basis for the final assessment presented. Additional changes to the project during the gap validation and verification process are not considered to be significant with respect to the main CDM/VCS objectives. The two CDM/VCS main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

Areas of validation and verification findings	**No. of CL**	**No. of CAR**	**No. of FAR**
Project design document and Monitoring report	00	00	00
Description of project activity	00	01	00
Application of selected baseline and monitoring methodology and selected standardized baseline			
Applicability of methodology and standardized baseline	00	00	00
Deviation from methodology	00	00	00

Clarification on applicability of methodology, tool and/or standardized baseline	00	00	00
Project boundary	00	00	00
Establishment and description of baseline scenario	00	00	00
Demonstration of additionality	00	00	00
Emission reductions	00	02	00
Calibration details	00	01	
Monitoring plan	00	00	00
No Net harm assessment	00	00	
Local stakeholder consultation	00	00	
Others (please specify)- Validation findings: 1. Matter related to double counting 2. Correction on connected grid	00	02	00
Total	00	Validation findings: 02 Verification findings: 04 Total: 06	00

The list of findings and there resolution is presented in Appendix 2 of this report.

2.5.1 Forward Action Requests

This is 1st periodic verification + Gap Validation of the project activity and no FAR is raised.

2.6 Eligibility for Validation Activities

The Validation and verification body holds accreditation to carry out both Gap validation and verification activities. The accreditation scope can be checked from the below link:

http://cdm.unfccc.int/DOE/list/DOE.html?entityCode=E-0032

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The present project activity is registered under CDM mechanism (UN reference number: 4572). The project can be traced via link (http://cdm.unfccc.int/Projects/DB/LRQA%20Ltd1300097036.88/view)

The gap validation is performed for the project activity as per Para 3.11.10 of VCS standard version 3.7. As per the requirement of this template following are the observation of the assessment team:

1. The project is registered under CDM mechanism and UN reference number of the project is 4572. The project title is "*Wind power project at Theni by Powerica Limited*".
2. The project is eligible under Para 3.11.10 of VCS standard version 3.7.
3. Assessment team adopted a step wise procedure to assess the respective clause required for gap validation under VCS vide Para 3.11.10 of VCS standard version 3.7

:

- Clause 1.1: The project activity involves a total installation of 6 Wind Turbine Generators (WTG) of total generating capacity of 9.9 MW (6 units of Vestas make V82 WTG). The WTG units are installed in Theni district of the state of Tamilnadu. The project aims at providing electricity to the state of Tamilnadu by effective utilization of renewable resources. The same is also confirmed from the registered CDM PDD and registered final Validation report. There was no activity at the site prior to implementation of the project activity (Greenfield). The electricity generated by the project is exported to the Indian grid. The project activity will therefore displace an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid. Since Wind power is Greenhouse Gas (GHG) emissions free, the power generated will prevent the anthropogenic gas emissions generated by fossil fuel based thermal power stations comprising coal, diesel, furnace oil and gas. Assessment team checked the project activity description and confirm that there is no change from the registered CDM PDD and implementation of the project. Hence the project is eligible under Clause 1.1 of VCS PD.

- Clause 1.2: According to the categorisation system of the Clean Development Mechanism, which is part of Green House Gas (GHG) program that has been approved by the VCS board, the project is categorised as:
  Type I: Renewable energy projects
  Category: Grid connected renewable electricity generation – AMS-I.D. Version 16: Assessment team checked the type and category of the project activity and found that the project is eligible under Type I and renewable category of project. Hence the project is eligible under Clause 1.2 of VCS PD.

- Clause 1.3: Assessment team observed that the name, title, address, phone number of the project participant is same as per the CDM registered PDD. Hence, Clause 1.3 as depicted in the VCS PD for gap validation is acceptable to the assessment team.

- Clause 1.5: The start date of the project is considered as the commissioning date of the first WTGs (as per the Commissioning certificate of the WTGs) and the same is correct as per the definition of start date of VCS. The emission reduction is claimed from the commissioning date which is correct as per the requirement of Para 3.11.10 of VCS standard version 3.7. Hence, Clause 1.5 as depicted in the VCS PD for gap validation is acceptable to the assessment team.

- Clause 1.6: The Project activity is commissioned on 13/09/2010 (Commissioning certificate is checked) hence starts date of PRE-CDM VCS crediting period is 13/09/2010. Assessment team confirm that the crediting period for VCS began on 13/09/2010 and will end on 12/09/2020. The project proponent will also not claim GHG emission reductions under two schemes for the same period. The GHG credits from 11/12/2012 to 10/09/2018 will be claimed under VCS only. An undertaking from the project participant confirms that project will not claim any other scheme benefits for the concerned monitoring period.

- Clause 1.7: The emission reduction of the project activity is less than 300,000 tCO_2 e per annum and thus project falls under project category as per the requirement of VCS. Thus

clause 1.7 as depicted in the VCS PD for gap validation is acceptable to the assessment team.

- Clause 1.9: The project location (along with Latitude and longitude) of the project activity is checked by the assessment team during the onsite visit through GPS tracker. The co-ordinates are also checked via Google earth software and it is confirmed that the detail as presented in registered CDM PDD and VCS PD is correct. The latitude and longitude of the project is as below:

WTG	HTSC No.	Village	Latitude	Longitude
TSSP1255	T-144	Shanmuga Sundarapuram	09° 59' 40''	77° 34' 10''
TM721	T-141	Mottanuthu	09° 58' 46''	77° 34' 43''
TSSP158	T-142	Shanmuga Sundarapuram	09° 59' 08''	77° 34' 39''
TM41	T-145	Mottanuthu	09° 58' 34''	77° 35' 24''
TGU28	T-139	Usilampatti	09° 57' 03''	77° 33' 33''
TSSP174	T-143	Shanmuga Sundarapuram	09° 59' 23''	77° 34' 43''

- Clause 1.10: This is a Greenfield project. The project activity replaces the carbon intensive grid electricity. The proposed project activity effectively utilises renewable wind energy to generate electricity which will be feed into the coal intensive Southern (now Indian) Grid. Thereby the project activity reduces the dependence on fossil fuel based generation units and as there are no associated emissions with this project it contributes to the reduction of greenhouse gases (GHG) emissions. Assessment team checked the baseline during the onsite visit and also cross checked with CDM PDD and validation report. Thus clause 1.10 as depicted in the VCS PD for gap validation is acceptable to the assessment team.

- Clause 1.12.1: The ownership details were checked by the assessment team using: Power agreement between owner and State Utility, Commissioning certificate and Purchase order of the WTGs. Thus clause 1.12.1 as depicted in the VCS PD for gap validation is acceptable to the assessment team.

- Clause 1.12.2: The project is registered under CDM and UNFCCC (Registration ID - 4572). The project is also approved by the DNA and a copy of the approval is available on the UNFCCC page. Project Proponent has submitted undertaking that they will not claim same GHG emission reductions of the project from CDM and VCS. PP would not use net GHG emission reductions by the projects for compliance with emission trading program to meet binding limits on GHG emissions. Thus clause 1.12.2 as depicted in the VCS PD for gap validation is acceptable to the assessment team.

- Clause 1.12.3: Project has been registered with UNFCCC under Clean Development Mechanism program. Registration reference number is 4572. Project Proponent has submitted undertaking for not availing other forms of environmental credit for the same monitoring period under consideration. Thus clause 1.12.3 as depicted in the VCS PD for gap validation is acceptable to the assessment team

- Clause 1.12.4: Project has been registered with UNFCCC under Clean Development Mechanism program, Registration reference number is 4572. PP also submitted undertaking for Project neither has any intends to generate any form of GHG related

environmental credit for neither GHG emission reductions nor removals claimed under the VCS program. Thus clause 1.12.4 as depicted in the VCS PD for gap validation is acceptable to the assessment team

- Clause 1.13: Assessment team checked that project do not falls under AFOLU category as the project is electricity generation from Wind turbines. No leakage involved as per the direction of AMS-I.D. Version 16 and CDM registered PDD. There is no commercially sensitive information accounted for the determination of baseline, net GHG removals and for demonstration of additionality for the present project activity. There are no information or incidents that will have bearing on the eligibility of the project, the net GHG emission reductions or removals, or the quantification of the project's net GHG emission reductions or removals. Thus clause 1.13 as depicted in the VCS PD for gap validation is acceptable to the assessment team

- Clause 2.6: No methodology deviation is envisaged for the present project activity and thus the same is acceptable to the assessment team.

The respective undertaking for Clause 1.12.2, 1.12.3 and 1.12.4 were not submitted to the assessment team. CAR 01 was thus raised regarding the same and after submission of satisfactory documents the Non Conformity (NC) is closed. The detail regarding the Non Conformity could be found in Appendix 2 of this report.

3.2 Methodology Deviations

No methodology deviation is envisaged for present verification.

3.3 Project Description Deviations

As per Para 3.6.1, sub para (2) of VCS standard version 3.7, project has undergone deviation in the monitoring plan from the registered CDM PDD.

As per registered CDM PDD, the calibration frequency is once in two years. The calibration of meters is not in control of PP and same is done by state electricity board. The state electricity board does not follow any fixed calibration frequency; hence deviation is requested for change in calibration frequency as once in five years. This calibration frequency is as per CEA notification http://www.aegcl.co.in/Metering_Regulations_Of_CEA_17_03_2006.pdf, page 12

The change in calibration frequency does not have any impact on ER calculations as during monthly reading state electricity board official and PP representative check the meter conditions. Also, both parties accept the reading and PP raise the invoice to state electricity board based on monthly JMR reading. Thus financial obligations are involved which ensures that meters are running accurately.

CAR 06 was raised during the verification process and closed successfully. The detail regarding the Non Conformity could be found in Appendix 2 of this report.

3.4 Grouped Project

This is not a grouped project. Thus this section is not applicable.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

During the verification site visit it was concluded that the project is implemented as per the requirement of the CDM registered PDD and Final Validation report. During the current monitoring period it was observed that no unforeseen incident/event evolved which can impact the operation of the project activity. The project undergone continuous operation and only scheduled maintenance is observed as per the manufacturer's specification which is acceptable to the assessment team.

CAR 03 was raised during the verification process regarding inconsistencies in the MR. The NC is closed successfully. The detail regarding the Non Conformity could be found in Appendix 2 of this report.

Feeder details are provided which is confirmed by the assessment team during the verification site visit.

Breakdown log sheets for individual power project i.e. WTGs breakdown log sheets are submitted by PP. There was no major breakdown during the monitoring period. Scheduled maintenance was carried out as per the instruction of the manufacturer and the same is acceptable to the assessment team. The shutdown details were also included as Appendix 2 in the revised MR Version 02 which is checked and found correct.

Project location is confirmed by the assessment team during the site visit. Assessment team also checked with the GPS meter regarding the latitude and longitude of the project site and confirm that the details as mentioned in the registered PD are correct. The detail is as below:

WTG	HTSC No.	Village	Latitude	Longitude
TSSP1255	T-144	Shanmuga Sundarapuram	09° 59’ 40’’	77° 34’ 10’’
TM721	T-141	Mottanuthu	09° 58’ 46’’	77° 34’ 43’’
TSSP158	T-142	Shanmuga Sundarapuram	09° 59’ 08’’	77° 34’ 39’’
TM41	T-145	Mottanuthu	09° 58’ 34’’	77° 35’ 24’’
TGU28	T-139	Usilampatti	09° 57’ 03’’	77° 33’ 33’’
TSSP174	T-143	Shanmuga Sundarapuram	09° 59’ 23’’	77° 34’ 43’’

Assessment team also checked the Technical details of the WTGs installed onsite. The same is checked during the onsite visit from the number plate capacity of each WTG and also cross checked from the technical manual of the Manufactures. The detail is as below:

Parameters	Value
Make	Vestas
Model	V-82
Rated Power	1650 KW
Rotor diameter	82 m
Swept area	5281 m^2
Cut in wind speed	3.5 m/s
Rated wind speed	13 m/s
Cut out wind speed	20 m/s
No. of Blades	3

Regulation	Active stall
Toer Height	78 m
Insulation	Class F/B

Assessment team checked the commissioning certificate and confirmed that the dates of Commission for the WTGs are correct.

The assessment team confirmed that there is no proposed or actual change to the project design during this monitoring period. The project design as mentioned in the registered PDD is implemented and thus the same is acceptable to the assessment team. All required monitoring equipment's and procedures as mentioned in the registered PDD are available and implemented in an appropriate manner.

The organisational role and responsibility as mentioned in the registered PD is followed onsite. All the monitoring equipment was not calibrated as per the specified interval in the registered PD. However, PP has submitted a deviation request for the same, which has been accepted by the assessment team. All the emergency preparedness as mentioned in the registered PD is followed onsite and no discrepancies were found regarding the same.

Assessment team would like to clarify that the project is registered under CDM number 4572. The present monitoring period is 11/12/2012 to 10/09/2018 (inclusive of both days) and no credit is claimed from other mechanism in the present monitoring period except from VCS therefore avoiding any double counting. A written declaration is also checked by the assessment team which confirms that PP will not claim any GHG emission for the present monitoring period from any other mechanism.

It was also observed during the verification process is that project is not rejected by any other GHG program around the world.

Assessment team hereby also confirms from the declaration made by PP the projects are not registered under the REC mechanism of India and the same is cross-checked at https://recregistryindia.nic.in. Moreover as per state tariff policy the project is not eligible to receive REC benefits as it is selling power to State electricity grid.

The assessment team observed that the project is in line with the registered PD, FVR and approved methodology and thus no clarification/deviation is sought.

Sustainable development indicators

The National CDM Authority (NCDMA), which is the Designated National Authority (DNA) for the Government of India (GOI) under the Ministry of Environment, Forests and Climate Change (MoEFCC), has mentioned four indicators for the sustainable development in the interim approval guidelines for Clean Development Mechanism (CDM/VCS) projects from India[4].Thus the project's contribution towards sustainable development has been addressed based on the following sustainable development aspects:

[4] http://www.cdmindia.gov.in/approval_process.php

Social well-being

The project activity provided / provides job opportunity to local people during erection, commissioning and maintenance of the Wind project. Frequency of visiting villages and nearby areas by skilled, technical and industrialist increase due to installation /site visit/operation and maintenance work related to solar plant. This directly and indirectly positively affects the economy of villages and nearby area.

Environmental well-being

Wind power is one of the cleanest renewable energy powers and does not involve any fossil fuel. There are no GHG emissions. The impact on land, water, air and soil is negligible. Thus the project activity contributes to environmental well-being without causing any negative impact on the surrounding environment.

Economic well-being

The VCS project activity generates permanent and temporary employment opportunity within the vicinity of the project. The electricity supply in the nearby area improves which directly and indirectly improves the economy and lifestyle of the area.

Technological well-being

The project activity is step forward in harnessing the untapped wind potential and further diffusion of the wind technology in the region. The project activity leads to the promotion and demonstrates the success of wind projects in the region which further motivate more investors to invest in wind power projects. Hence, the project activity leads to technological well-being.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the VCS PD. The verification team has checked whether calculations of baseline GHG emissions, project GHG emissions and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the monitoring plan of the VCS PD
Findings	CAR 04 and CAR 05 were raised during the verification process and closed successfully. Please refer Appendix 2 of this report for the detail closure of the CARs
Conclusion	The baseline Emissions for a given year is calculated by multiplying the energy baseline (EB) with the regional grid emission factor. Formula Used:- BE_y = Baseline Emission Factor ($EF_{Grid,CM,y}$) x (EG_y – EC_y) Where, BE_y = Baseline Emissions (tons/year) EG_y: Electricity exported to grid annually (MWh) EC_y: Electricity imported from grid annually (MWh). <u>Ex ante Parameters:</u>

	$EF_{grid,CM,y,}$ $EF_{grid,BM,y}$, $EF_{grid,OM,y}$ were mentioned as ex-ante fixed parameter. Assessment team checked the values, source of data, choice of data, purpose of the data mentioned in the MR from the registered PDD and confirms that the similar approach was considered for the current monitoring period also. The values for $EF_{grid,CM,y}$= 0.9445 tCO_2/MWh- Assessment team Confirmed that the value is as per the CDM registered PDD $EF_{grid,BM,y}$ = 0.8179 tCO_2/MWh- Assessment team Confirmed that the value is as per the CDM registered PDD $EF_{grid,OM,y}$ = 0.9868 tCO_2/MWh- Assessment team Confirmed that the value is as per the CDM registered PDD 1. $EF_{grid,OM,y}$: Operating Margin emissions factor for grid connected power generation in year y calculated using the latest version of "Tool to calculate the emission factor for an electricity system. $EF_{OM,y}$ is computed using the Simple Operating margin CO_2 emission factor. Simple Operating margin CO_2 emission factor is calculated from the weighted average CO_2 emissions per unit net electricity generation of all power plants serving the system, not including low-cost / must-run. This is in agreement with the guidance provided in the Tool to calculate the emission factor for an electricity system. The value is considered from CEA version 5 and registered PDD. Assessment team checked the registered PDD and found that value considered for emission reduction calculation in this present monitoring period is sourced from the registered PDD. Thus assessment team conclude that the emission reduction calculation for the present monitoring period is conservative and correct. 2. $EF_{grid,BM,y}$: Build Margin emissions factor for grid connected power generation in year y calculated using the latest version of "Tool to calculate the emission factor". Build margin emission factor is the generation-weighted average emission factor of all power plants m during the most recent year y for which generation data is available. The value is considered from CEA version 5 and registered PDD. Assessment team checked the registered PDD and found that value considered for emission reduction calculation in this present monitoring period is sourced from the registered PDD. Thus assessment team conclude that the emission reduction calculation for the present monitoring period is conservative and correct. 3. $EF_{grid,CM,y}$: Combined Margin emissions factor for grid connected power generation in year y calculated using the latest version of "Tool to calculate the emission factor for an electricity system. Combined Margin is computed using the official data sources and is in-line with the guidance provided in the tool. The value is considered from CEA version 5 and registered PD. Assessment team checked the registered PD and found that value considered for emission reduction calculation in this present monitoring period is sourced from the registered PDD. Thus assessment team conclude that the emission reduction calculation for the present monitoring period is conservative and correct. The value for $EF_{grid,CM,y,}$ $EF_{grid,BM,y}$, $EF_{grid,OM,y}$ were considered from the CO_2

	baseline database (Version 5 published by Central Electricity Authority (CEA). The default value as mentioned in the registered PD and MR are same. The value of combined margin in India is being given by CEA and thus assessment team conclude that the value is correct and appropriate. The default value in turn is used for baseline calculation as per the formula given in the registered PDD for the current monitoring period. Ex-post parameter: As per the registered monitoring plan and requirement of the registered methodology following parameters needs to be monitored: (a) Quantity of net electricity supplied to the grid in year y (**EG_y**) – The parameter is a sourced from primary source i.e. TNEB Statement of electricity generated by each WTG. The Statement of electricity generation provides the Values of Net electricity supplied by individual WTG including export and import values. Assessment team checked the same and found correct. The practice is as per the requirement of State regulatory authority and approved methodology. The tri-vector meter reading reflects the electricity exported and imported by the WTG. The invoices are used for cross check mechanism and are as per the requirement of registered PDD and approved methodology. The meter reading is taken during a fixed billing cycle of every month and representative of electricity board and Operation and maintenance personal onsite present during the process. Assessment team checked all the values of the Net electricity exported for the month from the TNEB Statement during the current monitoring period. The electricity meters are under the custody of the electricity board and calibrated by electricity board as per their standard procedures. The meters are calibrated in line with State Indian grid code regulations for such installations. Baseline emission factor is calculated as combined margin, consisting of a combination of operating margin (OM) and build margin (BM) factors. **BE_y** baseline emissions, tCO_2e = $(EF_{Grid,CM,y}) \times (EG_y - EC_y)$ = 0.9445 tCO_2 / MWh x (105,543.384 -1,159.272) MWh = 0.9445 tCO_2 / MWh x 104,384.112 MWh = 98,590 tCO_2 (Rounded Down) The emission reduction calculation is checked and thus found correct. The project activity involves in harnessing Wind power. So the emissions from the project are zero. Leakage emission is zero as per the registered PD. As per the applied methodology, emission reductions are calculated as follows:

	$ER = BE_y – PE_y - LE_y$ $= 98,590 – 0 – 0 = 98,590\ tCO_2e$ (rounded down)

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

Means of verification	The verification team checked the Calibration details of the monitoring meters with the calibration certificates.
Findings	CAR 06 was raised during the verification process. The description of the CAR and its closure is described below in Appendix 2 of this report
Conclusion	The metering arrangement is bi-directional energy meters (main and check, however, now only main meters are in place as TNEB removed check meters) at WTG location. These meters record several parameters including electricity exported & imported. These electricity meters are being used by state electricity board for statements (JMR). Assessment team found that since metering arrangement, monitoring practice, accuracy class, calibration interval is under control of state electricity board, the PP does not have control over this process. As per registered PDD, the Calibration frequency is once in a 2 year. PP has requested for a deviation for changing calibration frequency from 2 years to 5 years as per the recommendation of CEA. The details of deviation request have been provided in section 3.3 of report. The details of the Calibration is presented in Appendix 5 Assessment team confirms that all the energy meters installed at WTG locations are of accuracy class of 0.2s are calibrated as per the national standards followed by the electricity board, but they are calibrated at least once in a 5 year. The Meter and testing division of the electricity board is accredited by NABL (National Accreditation Board for Laboratory, Govt of India) to carry out the testing of the meters which is as per the national regulation and thus traceability of the Calibration is also confirmed by the assessment team. PP had requested for change in calibration frequency as per CEA notification by Ministry pf Power, Govt. of India (http://www.aegcl.co.in/Metering_Regulations_Of_CEA_17_03_2006.pdf , page 12). As the calibration of meters is not in control of PP and same is done by state electricity board. The state electricity board does not follow any fixed calibration frequency; hence deviation requested by PP approved. DoE confirms that this change in calibration frequency will not have any impact on ER calculations as during monthly reading state electricity board official and PP representative check the meter conditions. Also both parties accepts the reading and PP raise the invoice to state electricity board based on monthly JMR reading. Thus, financial obligations are involved which ensures that meters are running accurately.

4.4 Non-Permanence Risk Analysis

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
NA	NA	NA	NA	NA

5 SAFEGUARDS

5.1 No Net Harm

No potential environment or socio-economic matter was found during the site visit. The project is renewable energy project and thus no negative impact observed onsite.

The project activity promotes environmental and socio-economic well-being as it results in zero GHG emissions due to installation and operation of clean, renewable energy technology for electricity generation. The report on "Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Projects" prepared by MNRE dated September 2013. This report clearly mentioned that Wind power project activity operations do not result in direct air pollution, noise pollution. Moreover, also as per the Central Pollution Control Board of India notification[5] wind project falls under White Category and are practically non-polluting.

However, assessment team still conducted the No net harm assessment for some of the parameters and the result is described below.

SL.NO	Indicator	Assessment team opinion
1	Air quality	The project generates clean energy which replaces the fossil fuel intensive electricity generation. Also report on "Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Projects" prepared by MNRE dated September 2013. This report clearly mentioned that Wind plant operations do not result in direct air pollution. Adequate measures were taken to mitigate the envisaged impacts like spraying water on the road side to reduce dust level, etc. This was confirmed by the local stakeholders. Therefore, it is validated that mitigation measures were robustly implemented on ground for air quality issues project will have a positive impact on air quality.
3	Soil condition	There are negligible impacts envisaged during operation of the project activity. For mitigating the impacts during construction, various mitigation

[5] http://envfor.nic.in/sites/default/files/Latest_118_Final_Directions.pdf

		measures were taken which is validated from the plant records of PP and the interview with local villagers. The top soil excavated during construction, was stockpiled and used for compaction. The roads were not paved and soling was done with excavated earth & rock material, so land disturbance could be minimized. It was also confirmed that, the vegetation done at site helps for soil erosion. The same is confirmed during the stakeholder meetings during onsite visit. Therefore, it can be concluded that the project has no effect on soil conditions during its operation because it has no waste coming out.
4	Biodiversity	During the validation site visit it was observed that the condition of ground vegetation will be gradually improved; No rare species has been found in the around area. The project site is not on the migration route of migratory bird. As Such Wind plant do not have any obstruction in the path of migratory birds. With the implementation of Project, the greening water will be increased significantly; the biodiversity in the vicinity will be improved with the vegetation improvement. No negative impact envisaged.
5	Employment Generation	The project activity employed local population as skilled workers as well as security guards which were envisaged during the validation site visit. The personnel employed by the project activity are also provided trainings and exposed to various awareness programs therefore a positive indicator has been accepted.
6	Livelihood of the poor	The project is associated with infrastructure development like roads in the nearby areas and promoting economic activities like grants to local school and communities temples etc. Also, project employed local villagers as guards for the security of power project. Positive impact envisaged. .

5.2 Local Stakeholder Consultation

All the stakeholders are happy with the implementation and operation of the project activity and no negative comments envisaged for the project activity. There was no change in technical project description form the registered VCS PD. Assessment team confirmed the same during the verification site visit. Also, as best practice method PP also placed a grievance register onsite to record any grievance from the stakeholders during and after the implementation of the project activity. Assessment team checked the grievance register maintained onsite and no negative comments were observed for the project activity. Local people are happy as the project generated employment opportunities and thus the living standards in and around the vicinity of the project is increased and thus assessment team confirms that local stakeholders have no issue with this project activity after implementation and continuous operation.

The interaction with some of the stakeholders during the site visit is presented below:

Name of the stakeholder	Mr. Ajay K.V.
Occupation	Villager
DOE questions: Did the power plant discharge any harmful pollutants? Answer: NO the plant does not discharge any harmful pollutants. DOE questions: Did the power plant destroy any crop fields? Answer: The plant is implemented in barren land and there were no any fertile land or crop which is damaged.	

Name of the stakeholder	Mr. Ezhil
Occupation	Villager
DOE QUESTION: Did PP promised employment opportunity? Answer: Locals explained that as promised employment opportunity is provided to the local villagers. DOE also like to conclude that during the site visit it was observed that local people were employed for security and operation related work like water spraying, vegetation improvement and other unskilled work. DOE also found that skilled local persons were also employed by the organization for the operation and maintenance of the power plant.	

6 VERIFICATION CONCLUSION

Applus+ Certification has been engaged by Powerica Limited to perform the gap validation and 1st periodical verification of the "Wind Power Project at Theni by Powerica Limited".

The management of Powerica Limited is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project's Monitoring Plan in the registered VCS PD and the applied methodology AMS-I.D. Version 16.

Our Gap Validation approach was based on the requirements as defined under the Kyoto Protocol, Marrakesh accord, as well as those defined by the CDM Executive Board and VCS board. Our approach is risk-based, drawing on an understanding of the risks associated with estimated GHG emissions data and the controls in place to mitigate these. The validation can confirm that:

- The projects description compliance with, the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS guideline and standard version 3.7.

- The project's monitoring plan is assessed against "AMS-I.D. Version 16" for large scale project.

- A risk based approach has been followed to perform this validation activity. The review of the project description and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews with Project Owner have provided LGAI Technological Center S.A. (Applus+ Certification) with sufficient evidence for positive validation opinion as per the requirement of VCS.

- The relevant Clause as required by Para 3.11.10 of VCS standard version 3.7 is assessed with third party documents and relevant supporting documents to fulfil the requirement.

Our Verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakesh accord, as well as those defined by the CDM Executive Board. Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. The verification team can confirm that:

- the project is operated as planned and described in the project document;

- the monitoring plan is as per the applied methodology;

- the monitoring process in Monitoring Report is as per the PD

- the development and maintenance of records and reporting procedures are in accordance with the monitoring plan;

- the installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately;

- the monitoring system is in place and generates GHG emission reductions data;

- the GHG emission reductions are calculated without material misstatements.

Verification period: 11/12/2012 to 10/09/2018 (inclusive of both days).

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)
2012	752	0	0	752
2013	17,216	0	0	17,216
2014	15,871	0	0	15,871
2015	11,353	0	0	11,353
2016	19,099	0	0	19,099
2017	18,933	0	0	18,933
2018	15,366	0	0	15,366
Total	**98,950**	**0**	**0**	**98,950**

Assessment team checked the calculation of estimated VER versus Actual VER. As per the registered CDM PDD the amount of VERs annually is 22,798 tCO_{2e}. The days involved in present monitoring period are 2100. Therefore on pro-rate basis the estimated VERs for the monitoring period is 131,167 tCO_{2e}. Actual VERs obtained for the monitoring period is 98,590 tCO_{2e} and thus the actual VER is 25% lower than the estimated VER. This variation is majorly due to the variations in wind flow pattern, grid availability and other parameters which are not in the control of PP.

APPENDIX 1: DOCUMENTS REVIEWED OR REFERENCED (VERIFICATION)

No.	Author	Title	References to the document	Provider
1	NA	Commissioning certificates of the WTGs implemented in the project site.	Commissioning certificates of the WTGs implemented in the project site.	Project participant
2	NA	Contract of the project participant with the DOE	Contract document signed between PP and DOE	Project participant
3	NA	Technical specifications of WTGs generators from manufacturers	Manufacturer technical specifications	Project participant
4	NA	Registered Final Validation report and registered CDM PDD http://cdm.unfccc.int/Projects/DB/LRQA%20Ltd1300097036.88/view	NA	Project participant
6	NA	Emission Calculation sheet version 01 Emission Calculation sheet version 02	ER sheet Dated 27/11/2018 ER sheet Dated 29/12/2018	Project participant
7	NA	The operational lifetime of the project activity from the manufacturer=(Technical specifications)	Manufacturer technical specifications	Project participant
8	NA	UNFCCC www.cdm.unfccc.int CEA: Central electricity authority www.cea.nic.in VCS: Verified Carbon Standard www.v-c-s.org	Reference link is provided.	Independent Search
09	NA	Tools/ guidelines used in the project activity • Glossary of CDM terms version 07 • VCS verification report template version 03	UNFCCC CDM/VCS web site	UNFCCC
10	NA	Monthly statement (JMR) for the complete monitoring period	Monthly statement (JMR) for the complete monitoring period	PP

		Invoices for the complete Monitoring period	Invoices for the complete Monitoring period	
11	NA	MR version 01 MR version 02 VCS PD version 01 VCS PD version 02	27/11/2018 29/12/2018 27/11/2018 29/12/2018	PP
12	NA	Break down details of the complete monitoring period	Log sheet	PP
13	NA	Declaration regarding no participation in other GHG program for the concerned monitoring period	Declaration dated 10/12/2018	PP

APPENDIX 2: CORRECTIVE ACTION REQUESTS, CLARIFICATION REQUESTS AND FORWARD ACTION REQUESTS (CAR/CL/FAR)

VALIDATION FINDINGS:

CAR ID	01	**Section no.**	1.12.4 of VCS PD	**Date:** 28/12/2018
Description of CAR				
VCS PD provided reference of UNFCCC Registration in Section 1.12.4. Thus, PP requested to provide details of the CERs issued till date and also copy of undertaking in effect of no double counting of CDM & VCS emission reductions achieved will take place.				
Project participant response				**Date: 29/12/2018**
The project is registered with CDM having UN reference number as UN4572. The CDM CERs are issued from 01/05/2011 to 10/12/2012. The VCS monitoring period starts from 11/12/2012 to 10/09/2018. PP will not claim the CDM benefits for that VCS monitoring period and will claim only VCU benefits. The undertaking for no double accounting has been provided to DOE.				
Documentation provided by project participant				
Undertaking of PP for no double accounting				
DOE assessment				**Date: 26/03/2019**
The undertaking dated 10/12/2018 is checked and found correct. CER issued till 10/12/2012 and same is checked with UNFCCC webpage. The project is not claiming any other benefit for the concerned monitoring period as confirmed from the undertaking. CAR is thus closed.				

CAR ID	02	**Section no.**	VCS PD	**Date:** 28/12/2018
Description of CAR				
Corrections/reference inclusion requested in the revised project description with respect to connected grid at present.				
Project participant response				**Date: 29/12/2018**
The correction has been made with mention of Indian Grid of the project activity.				
Documentation provided by project participant				
VCS MR Version 02				
DOE assessment				**Date:26/03/2019**
The details are now included in the revised VCS PD and thus CAR is closed.				

VERIFICATION FINDINGS:

CAR ID	03	**Section no.**	VCS MR	**Date:** 28/12/2018
Description of CAR				
Following inconsistencies observed in the MR: 1. MR not consistent about inclusion of first & last days of monitoring period. 2. Corrections/reference inclusion requested in the revised project description with respect to connected grid at present. 3. PP requested to submit commissioning certificates of the WTGs involved in the project activity. 4. PP requested to provide details of CERs issued under CDM mechanism till date.				
Project participant response				**Date: 29/12/2018**
1. It is mentioned about inclusive of first and last day for monitoring period in revised VCS MR. 2. The transparent note is mentioned about integration of grid and it is mentioned that Southern grid is now part of Indian Grid. Since project activity registered with CDM with consideration of fixed ex-ante southern grid emission factor, hence southern grid is also kept in VCS PD and VCS MR. 3. The commissioning certificates are provided to DOE.				

4. The project is registered with CDM having UN reference number as UN4572. The CDM CERs are issued from 01/05/2011 to 10/12/2012. The total CERs of 39,722 are issued from this monitoring period. The VCS monitoring period starts from 11/1/22012 to 10/09/2018. PP will not claim the CDM benefits for that VCS monitoring period and will claim only VCU benefits. The undertaking for no double accounting has been provided to DOE.
Documentation provided by project participant
VCS MR Version 02 Commissioning certificates
DOE assessment **Date:26/03/2019**
Following are the observation of the DOE: 1. VCS MR now mentions the first and last day for monitoring period. CAR is thus closed 2. The project description now includes the connection details to the grid. CAR is thus closed. 3. The commissioning certificates are submitted and the same is found correct. CAR is thus closed. 4. Details of CERs issued are provided and checked with UNFCCC webpage. Same found correct. VCS Monitoring period is starting after end of CDM monitoring period. The undertaking for no double accounting has been provided. Thus CAR closed.

CAR ID	04	**Section no.**	3.2 of MR	**Date:** 28/12/2018
Description of CAR				
PP requested to submit JMR and invoices for complete monitoring period in support of net electricity exported by the project activity.				
Project participant response				**Date:29/12/2018**
The JMR and invoices for complete monitoring period are submitted to DOE				
Documentation provided by project participant				
JMR and Invoices				
DOE assessment				**Date:** 26/03/2019
The Share certificate and the invoices for the monitoring period is checked and found correct by the assessment team. The ER calculation is thus conservative and hence the CAR is closed.				

CAR ID	05	**Section no.**	3.2 of MR	**Date:** 28/12/2018
Description of CAR				
Corrections requested in the Invoices values in ER sheet for month of Jan 2015 to March 2015.				
Project participant response				**Date: 29/12/2018**
The corrections are done for Jan 15 to March 15 period for invoices values.				
Documentation provided by project participant				
ER spreadsheet version 02				
DOE assessment				**Date:26/03/2019**
ER sheet has been checked and found correct. CAR is closed.				

CAR ID	06	**Section no.**	3.2 of MR	**Date:** 28/12/2018
Description of CAR				
PP requested to submit calibration certificates of the monitoring meters involved in the project activity..				
Project participant response				**Date: 29/12/2018**
Calibration certificates are submitted to DOE. The deviation is requested to change the calibration frequency as this is not under control of PP. The calibration frequency is under control of state electricity board, thus calibration frequency as per CEA notification which mentioned calibration as once in five years is considered for project activity.				
Documentation provided by project participant				
Calibration Certificates VCS MR version 02				

DOE assessment	**Date:26/03/2019**
The Calibration certificate for the monitoring period is submitted to the assessment team. The latest calibration certificate is found correct. Deviation for change in frequency of calibration of monitoring meters is sought and same is assessed & accepted by assessment team. No delay in calibration found. CAR is thus closed.	

APPENDIX 3: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Verification findings
1.	Lead Auditor/Technical Expert	OR	Takarkhede	Dr. Atul	TQC-Outsourced entity	Yes	Yes	Yes	Yes

Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer (TR)	EI	Xue	Denny	Applus+ Certification
2.	Approver	IR	Sendin	Juan	Applus+ Certification B.U. Managing Director

Short CVs of the Team:

1. Dr. Atul Takarkhede counts with 9 years of experience in field of Environmental Auditing, consulting and accreditation. He is an Expert in ISO 9001-14001, CO2/GHG Reporting, Carbon Foot Print, Energy, Water and Waste Management Reporting for organizations environmental performance. His professional portfolio is mainly related with carrying out EIA, conducting QA/QC of EIA Reports; Conducting Environmental/water Audits; NABET requirements appliance. Furthermore, he counts with solid experience on CDM-VCS-GS consultancy and auditing. He has Ph.D. (Environmental Science) from Institute of Science, RTM Nagpur University, Nagpur, and he has already published different technical reports related to environmental science. Currently he is associated with True Quality Certifications Private Limited and is empanelled with APPLUS certification to carry out GHG audit.
2. Hanshen (Denny) Xue (Master Degree in Environmental Engineering, Bachelor Degree in Thermal Engineering) is an Auditor appointed by Applus+ LGAI for the GHG project assessment. He is based on Shanghai. He has more than 1.5 years of work experiences in CDM project development. Before he joined Applus+ LGAI, he has been worked for Shanghai Chuanji Investment and Management which is a CDM consultancy company as a project manager for CDM project development.

APPENDIX 4: ABBREVIATIONS

Abbreviations	Full texts
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CEA	Central Electricity Authority
CL	Clarification request
CM	Combined Margin
CMS	Central Monitoring system
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EF	Emission Factor
EIA	Environmental Impact Assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming potential
RBI	Reserve Bank Of India
PP	Project Participant
TNEB	Tamilnadu State Electricity Board

APPENDIX 5: CALIBRATION DETAILS OF THE METERS

The calibration details of meters (Yard Meters) involved in the project activity are as below

WTG No.	Serial No. (Old meters)	Make	Year 2012	Year 2015	New Meter Serial No. (#New meters)	Make	Year 2017	Due date of Calibration
TGU 28 SS(T-139)	TNB 04431	Secure	11/08/2012	20/10/2015	627560	HPL	17/05/2017	17/05/2022
TM 41 SS(T-145)	TNB 04425	Secure	11/08/2012	20/10/2015	624763	HPL	17/05/2017	17/05/2022
TSSP 158 SS(T-142)	TNB 04415	Secure	11/08/2012	20/10/2015	624852	HPL	17/05/2017	17/05/2022
TSSP 174 SS(T-143)	TNB 04432	Secure	11/08/2012	20/10/2015	627558	HPL	17/05/2017	17/05/2022
TM 721 SS(T-141)	TNB 04435	Secure	11/08/2012	20/10/2015	627555	HPL	17/05/2017	17/05/2022
TSSP 1225 SS(T-144)	TNB 04427	Secure	11/08/2012	20/10/2015	627553	HPL	17/05/2017	17/05/2022

#The old meters are replaced by new meters and calibrated on 17/05/2017.

All meters are of Secure Make and 0.2s accuracy class. Considering once in five years calibration frequency as per CEA notification and as per deviation request, there is no any delay in calibration applicable for the project activity.