

VERIFICATION REPORT FOR “WIND POWER PROJECT AT ANTHIYUR, TAMIL NADU”



Document Prepared By: LGAI Technological Center, S.A. (Applus)

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Summary:

LGAI Technological Center, S.A. (hereafter referred to as Applus+ LGAI) has been contracted by M/s Nuziveedu Seeds Limited to conduct the verification of the project "Wind Power Project at Anthiyur, Tamil Nadu", VCS ID 682, against VCS Standard Version 3.7.

The verification includes confirming the implementation of the monitoring plan of the registered VCS PD and MR (Project ID 682) and the application of the monitoring methodology as per AMS ID version 14: "Grid connected Renewable Electricity Generation". A site visit was conducted to verify the data submitted in the monitoring report.

The purpose of this project activity is to generate electricity using renewable sources (wind) and export it to southern grid, thereby displacing the grid generated electricity.

A risk based approach has been followed to perform this verification. In the course of verification, 02 Corrective Action request (CARs) and 00 Clarification request (CLs) were raised and satisfactorily closed.

The review of the project design documentation, monitoring report and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and stakeholders have provided Applus+ LGAI with sufficient evidence to validate the fulfilment of the stated criteria.

Applus+ LGAI confirms that the project is implemented in accordance with the registered VCS PD & MR. The monitoring system is in place and the emission reductions are calculated without material misstatements. Our opinion relates to the projects GHG emissions and the resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring and its associated documents. Based on the information seen and evaluated we confirm that the emission reductions from the project activity "Wind Power Project at Anthiyur, Tamil Nadu" in India during the period 08/02/2010 to 31/03/2016 (including both days) amount to 175,420 tonnes of CO₂e.

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1 INTRODUCTION

1.1 Objective

Applus+ LGAI has been contracted by M/s Nuziveedu Seeds Limited (project proponent), to undertake the verification of the renewable energy project titled “Wind Power Project at Anthiyur, Tamil Nadu” (VCS ID- 682) The verifiers have reviewed the GHG data collected to date for the monitoring period from 08/02/2010 to 31/03/2016 (both days included) covered in this verification. The objective of this verification is a thorough and independent assessment of registered project activities against the applicable VCS requirement by the DOE. The verification process shall determine whether the proposed project activity complies with the requirements of latest VCS guidelines, applicability conditions of the selected methodology, relevant host country regulations and guidance issued by the VCS Board.

1.2 Scope and Criteria

The scope of the verification was the independent and objective review and ex-post determination of the monitored reductions in GHG emissions from “Wind Power Project at Anthiyur, Tamil Nadu” The verification of this project was based on the registered project description & monitoring report /xx/ and supporting documents submitted by the project proponent to the verification team. The documents were reviewed against the following guidance and protocols:

VCS Standard: VCS Version 3, 21/06/2017, v3.7 (VCS Standard)

Approved Clean Development Mechanism (CDM) methodology AMS I. D, version 14, “Grid connected Renewable Electricity Generation”.

Validated VCS Project Description, version 02 dated 27/10/2009

VCS Program Guide, Version 3, 21/06/2017, v3.7

ISO 14064-3: Specification with guidance for the validation and verification of greenhouse gas assertions, 2006

The verification is not meant to provide any consulting towards the client. However, stated request for clarifications and/or corrective actions may provide input for improvement of the project design.

1.3 Level of Assurance

The level of assurance of the verification report falls under reasonable assurance engagements as selected by the Client. The verification team verified the complete monitoring data for all the parameters of the monitoring plan and confirms that the reported emission reductions are free from any type of material errors. Materiality for the project is 5%.

1.4 Summary Description of the Project

The project activity involves electricity generation by wind electric convertors and supplying the generated electricity to the Southern Grid. The project being a renewable energy generation activity, it leads to removal of fossil fuel dominated electricity generation. The project activity results in reductions of greenhouse gas (GHG) emissions that are real, measurable, and verifiable and also plays beneficial role in the mitigation of climate change.

The project activity consists of 9 WTGs (1650 kW capacity each), making the total installed capacity to be 14.85 MW at Anthiyur Village of Udumalpet and Pollachi Talukas of Coimbatore District in Tamil Nadu.

Location of the project was verified through Latlong.net (<https://www.gps-coordinates.net/>) and found consistent with the data provided in the registered PD /01/. This information was verified during physical site visit and found to be in line with the details provided in the registered PD /01/.

The WTGs have been commissioned between 26/03/2005 and 17/05/2005. The same was verified against the registered VCS PD/01/ and commissioning certificates/12/. The emission reductions from the project activity during the period 08/02/2010 – 31/03/2016 (including both days) amount to 175,420 tonnes of CO₂e.

2 VERIFICATION PROCESS

The registered VCS project is undergoing second verification under VCS, the approach adopted to ensure the quality of emission reductions is described in the following sections.

2.1 Method and Criteria

Verification was conducted using Applus+ LGAI procedures in line with the requirements specified in the VCS Version 3 Requirements, CDM M&P, the latest version of the CDM Validation and Verification Standard, and relevant decisions of the COP/MOP and the CDM EB and applying standard auditing techniques.

It is to be assessed and determined whether the proposed implementation and operation of the project activity, and the steps taken to report emission reductions comply with the criteria and relevant guidance provided by the VCS Board. The validation/verification process consist of the following three phases;

- A desk review of the VCS PD and VCS MR
- Site visit and follow up interviews with project stakeholders
- The resolution of outstanding issues and issuance of final report and opinion.

2.2 Document Review

The verification is performed primarily as a document review of the registered VCS PD/01/, previous MR and Verification report and associated documents as stated in details in appendix 1 of this document. The assessment is performed by a verification team using a protocol. The cross checks between information provided in the Monitoring report, VCS PD and information from sources other than those used, if available, the team's sectoral or local expertise and, if necessary, independent background investigations.

2.3 Interviews

The site visit for the project location, by the assessment team, was conducted on 03/04/2017 and the following stakeholders were interviewed.

S N	Name	Organization
1	E. Satish kumar	M/s Nuziveedu Seeds Limited
2	R. Ramesh Kumar	M/s Nuziveedu Seeds Limited

The topics covered during interview ranges from general features and implementation of project to technical details of the project like calibration details, monitoring and measuring system and data collection, recording and archiving procedures. The assessment was drawn based on the feedback received during interview coupled with the documentation and on-site observations.

2.4 Site Inspections

A site visit was undertaken by the verification team on 03/04/2017 to carry out the following;

- An assessment of the implementation and operation of the registered project activity as per the registered VCS PD and VCS MR;
- A review of information flows for generating, aggregating and reporting the monitoring parameters;
- Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the PD;
- A cross check between information provided in the monitoring report and data from other sources such as plant logbooks, inventories, purchase records or similar data sources;
- A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PD, the applied methodology including applicable tool(s), and, where applicable, the applied standardized baseline;
- A review of calculations and assumptions made in determining the GHG data and emission reductions;
- An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

2.5 Resolution of Findings

The objective of this step is to identify, discuss and conclude on the issues related to the monitoring, implementation and operations of the registered project activity that could impair the capacity of the registered project activity to achieve emission reductions or influence the monitoring and reporting of emission reductions. This is done based on the desk review and onsite assessment. The verification team prepares and/or updates a verification protocol (internal document) that records the conformities and non-conformities, which may be of following types;

CAR (Corrective Action Request) is raised if one of the following occurs:

- Non-compliance with the monitoring plan, the methodology or the standardized baseline are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;
- Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions;
- Issues identified in a FAR during validation to be verified during verification or previous verification(s) have not been resolved by the project participants.

Clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met. All CARs and CLs raised by the Applus+ LGAI during verification shall be resolved prior to submitting a request for issuance.

FAR (Forward Action Request) is raised during verification if the monitoring and reporting require attention and/or adjustment for the next verification period.

All the findings that are raised and communicated to project participant during the verification are included under Appendix 3. The section also includes the response, if provided, by the project participants and an assessment by the verification team if it was closed out or otherwise.

2.5.1 Forward Action Requests

The project activity is undergoing fourth verification under VCS; there were no FARs raised during the validation or previous verification.

2.6 Eligibility for Validation Activities

Not applicable.

3 VALIDATION FINDINGS

Not applicable.

3.1 Participation under Other GHG Programs

The project activity is registered under the VCS only (VCS Project ID 682) and is not registered under any other emissions trading program or any other mechanism that includes GHG allowance trading. PP also confirms that net GHG emission reductions or removals generated during this monitoring period shall not be used for compliance under any such programs or mechanisms. This was confirmed through a declaration/15/ submitted by the PP and hence accepted by the assessment team.

3.2 Methodology Deviations

There is no methodology deviation identified during the current monitoring period.

3.3 Project Description Deviations

During the current monitoring period (from 08/02/2010 to 31/03/2016), calibration of the energy meters were not conducted as per the frequency determined in the registered PD and delay in the calibration was identified as project deviation. Project proponent has addressed the deviation in line with the paragraph 369(a) of CDM VVS version 01.

The assessment team able to confirm that the deviation identified during the 1st monitoring period and in the current monitoring period is appropriately described and justified and the project remains in compliance with the VCS rules. Also the deviation does not have an impact on the applicability of the methodology, additionality or the appropriateness of the baseline scenario.

3.4 Grouped Project

Not applicable. The project activity is not a grouped project

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activity consists of 9 WTGs installed at Anthiyur Village of Udumalpet and Pollachi Talukas of Coimbatore District in Tamil Nadu. The WTGs under the project activity have been commissioned between 26/03/2005 and 17/05/2005. The WTGs are of M/s Vestas Wind Technology with an individual capacity of 1.65 MW, summing up to 14.85 MW of total installation capacity. The installation and specification of WTGs has been check with commissioning certificates/12/ and on-site assessment/19/. The commissioning has also been duly validated in the VCS validation report of the project activity/02/. There was no major breakdown or shut downs during the monitoring period which might affect the applicability of methodology or might cause material errors in emission reductions.

Assessment team concludes the following:

- a) The implementation status of project activity was found to be in compliance with registered PD
- b) DOE has conducted the on-site visit to confirm the implementation status of the project.
- c) The commissioning date of the project activity was found to be accurately and consistently recorded.
- d) The actual operation of project activity was found to be in compliance with the flow diagram provided in registered PD.
- e) There was no increase in emission reduction from estimates made in registered PD, and hence no further justification to be provided for the same.

- f) The project is registered under VCS program only.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

The project monitoring has been carried in accordance with the registered VCS PD/01/ and the monitoring report/04/. The monitoring plan laid in the registered PD is being followed at the site/19/. The assessment team has verified the information flow (from data generation, aggregation, to recording, calculation and reporting for these parameters including the values) in the MR/05/.

The emission reductions are purely based on the net electricity generated and exported from the machines. PP has provided all the sufficient data for current monitoring period. The values of the parameter net electricity generation supplied to the grid by each phase used in deriving the GHG emission reduction could be very well correlated between the data sets and ER spreadsheet/06/ provided by PP. the verification of each monitoring parameter has been discussed later in section 4.3.

The calculation method and formulae used in calculating baseline emission is in compliance to the methodology used i.e. AMS- I. D. version 14 /10/. Since project activity is a wind power project, leakage emission and project emission has been considered as zero.

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

The below tables describe how the parameter, that is to be measured according to the monitoring plan, has been verified to confirm that the actual monitoring complies with the monitoring plan, monitoring data has been thoroughly assessed and that the calibration requirements are met.

Parameter	Gross Electricity export to the grid by the project during the year y, $EG_{Gross,y}$ (kWh)	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	The electricity exported to the grid is measured through energy meters at the WTG metering location on continuous basis and reported monthly.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The reporting frequency is in line with the monitoring plan as outlined in the registered PD/01/ and monitoring methodology/10/.
	Monitoring equipment	There is one set of dedicated energy meters (main & check meter) provided for each WTGs owner at 33 kV metering points.

	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	All the energy meters are two-way tri-vector meters of accuracy class 0.2s. Accuracy of the monitoring equipment's is in accordance with the monitoring plan as outlined in the registered PD.
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Yes the accuracy valid for the entire measuring range.
	Calibration frequency /interval:	Annual
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Yes the calibration frequency of the energy meters is in line with the monitoring plan of the registered PD.
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Calibration of the measuring equipment's is carried out by an accredited entity i.e. by state utility (TNEB)/07/
	Is(are) calibration(s) valid for the whole	Calibration of energy meters recording energy exported is valid for whole reporting period.

	reporting period?																			
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Yes, calibration carried out for a measuring range comparable with the range for which measurements have been carried.																		
	How were the values in the monitoring report verified?	Reported values of this parameter have been verified with monthly joint metering report/08/ during site visit .Value of this parameter for the current monitoring period is verified as 190,826,271 kWh. <table><tr><td>Year</td><td>Value Verified</td></tr><tr><td>2010</td><td>37,569,791 kWh.</td></tr><tr><td>2011</td><td>34,763,187 kWh.</td></tr><tr><td>2012</td><td>41,893,255 kWh.</td></tr><tr><td>2013</td><td>32,352,362 kWh.</td></tr><tr><td>2014</td><td>25,219,202 kWh.</td></tr><tr><td>2015</td><td>16,769,555 kWh.</td></tr><tr><td>2016</td><td>2,258,919 kWh.</td></tr><tr><td>Total</td><td>190,826,271 kWh.</td></tr></table> Furthermore monthly values of this parameter is reported in the ER calculation sheet/06/ are also verified with the monitoring report/05/ and found to be consistent.	Year	Value Verified	2010	37,569,791 kWh.	2011	34,763,187 kWh.	2012	41,893,255 kWh.	2013	32,352,362 kWh.	2014	25,219,202 kWh.	2015	16,769,555 kWh.	2016	2,258,919 kWh.	Total	190,826,271 kWh.
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2015	16,769,555 kWh.																			
2016	2,258,919 kWh.																			
Total	190,826,271 kWh.																			
If applicable, has the reported data been cross-checked with other available data?	The monthly reported values of this parameter were further cross checked with the monthly invoices raised by the PP /09/ and found to be consistent.																			
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the adequate QA/QC procedures were implemented by all the stakeholders, namely, the Grid Authority, the PP and the O&M Contractor. The data transfer process for the said parameter is as follows: The monthly Joint meter reading is taken by the representatives of TNEB (State utility) in the presence of NSL officials in the form of JMRs.																			

	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	No such issues.	
Findings	CAR #1 and CAR #2 was raised and resolved		
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology/10/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.		

Parameter	Net electricity supplied to the grid, EG _{net,y} (MWh)	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	The net electricity supplied to the grid is measured through energy meters at the WTG metering location on continuous basis and reported monthly.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The reporting frequency is in line with the monitoring plan as outlined in the registered PD/01/ and monitoring methodology/10/.
	Monitoring equipment	There is one set of dedicated energy meters (main & check meter) provided for each WTGs owner at 33 kV metering points.
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the	All the energy meters are two-way tri-vector meters of accuracy class 0.2s. Accuracy of the monitoring equipment's is in accordance with the monitoring plan as outlined in the registered PD.

	monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Yes the accuracy valid for the entire measuring range.
	Calibration frequency /interval:	Annual
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Yes the calibration frequency of the energy meters is in line with the monitoring plan of the registered PD.
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Calibration of the measuring equipment's is carried out by an accredited entity i.e. by state utility (TNEB)/07/
	Is(are) calibration(s) valid for the whole reporting period?	Calibration of energy meters recording energy imported is valid for whole reporting period.
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Yes, calibration carried out for a measuring range comparable with the range for which measurements have been carried out.

	How were the values in the monitoring report verified?	Reported values of this parameter have been verified with monthly joint meter reading report/08/ during site visit .Value of this parameter for the current monitoring period is verified as 189,295 MWh. <table><tr><td>Year</td><td>Value Verified</td></tr><tr><td>2010</td><td>37,391 MWh</td></tr><tr><td>2011</td><td>34,524 MWh</td></tr><tr><td>2012</td><td>41,647 MWh</td></tr><tr><td>2013</td><td>32,110 MWh</td></tr><tr><td>2014</td><td>24,981 MWh</td></tr><tr><td>2015</td><td>16,498 MWh</td></tr><tr><td>2016</td><td>2,143 MWh</td></tr><tr><td>Total</td><td>189,295 MWh</td></tr></table> Furthermore monthly values of this parameter is reported in the ER calculation sheet/06/ are also verified with the monitoring report/05/ and found to be consistent.	Year	Value Verified	2010	37,391 MWh	2011	34,524 MWh	2012	41,647 MWh	2013	32,110 MWh	2014	24,981 MWh	2015	16,498 MWh	2016	2,143 MWh	Total	189,295 MWh
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Total	189,295 MWh																			
	If applicable, has the reported data been cross-checked with other available data?	The monthly reported values of this parameter were further cross checked with the monthly invoices raised by the PP /09/ and found to be consistent.																		
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the adequate QA/QC procedures were implemented by all the stakeholders, namely, the Grid Authority, the PP and the O&M Contractor. The monthly Joint meter reading is taken by the representatives of TNEB (State utility) in the presence of NSL officials in the form of JMRs.																		
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1	No such issues.																		

	to the CDM Project Standard?	
Findings	CAR #1 and CAR #2 was raised and resolved	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology/10/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.	

Parameter	Electricity imported from the grid by the project during the year y EG _{import,y} (kWh)	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	The electricity imported to the grid is measured through energy meters at the WTG metering location on continuous basis and reported monthly.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The reporting frequency is in line with the monitoring plan as outlined in the registered PD/01/ and monitoring methodology/10/.
	Monitoring equipment	There is one set of dedicated energy meters (main & check meter) provided for each WTGs owner at 33 kV metering points.
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment	All the energy meters are two-way tri-vector meters of accuracy class 0.2s. Accuracy of the monitoring equipment's is in accordance with the monitoring plan as outlined in the registered PD.

	comply with local/national standards, or as per the manufacturer's specification?	
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Yes the accuracy valid for the entire measuring range.
	Calibration frequency /interval:	Annual
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Yes the calibration frequency of the energy meters is in line with the monitoring plan of the registered PD.
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Calibration of the measuring equipment's is carried out by an accredited entity i.e. by state utility (TNEB)/07/
	Is(are) calibration(s) valid for the whole reporting period?	Calibration of energy meters recording energy imported is valid for whole reporting period.
	Is the calibration carried out for a measuring range comparable with the range for which	Yes, calibration carried out for a measuring range comparable with the range for which measurements have been carried out.

	measurements have been carried out?																			
	How were the values in the monitoring report verified?	Reported values of this parameter have been verified with monthly joint meter reading report/08/ during site visit .Value of this parameter for the current monitoring period is verified as 1,531,038 kWh. <table><tr><td>Year</td><td>Value Verified</td></tr><tr><td>2010</td><td>178,858 kWh</td></tr><tr><td>2011</td><td>238,820 kWh</td></tr><tr><td>2012</td><td>246,058 kWh</td></tr><tr><td>2013</td><td>241,919 kWh</td></tr><tr><td>2014</td><td>237,729 kWh</td></tr><tr><td>2015</td><td>271,696 kWh</td></tr><tr><td>2016</td><td>115,956 kWh</td></tr><tr><td>Total</td><td>1,531,038 kWh</td></tr></table> Furthermore monthly values of this parameter is reported in the ER calculation sheet/06/ are also verified with the monitoring report/05/ and found to be consistent.	Year	Value Verified	2010	178,858 kWh	2011	238,820 kWh	2012	246,058 kWh	2013	241,919 kWh	2014	237,729 kWh	2015	271,696 kWh	2016	115,956 kWh	Total	1,531,038 kWh
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	2010	178,858 kWh																		
	2011	238,820 kWh																		
2012	246,058 kWh																			
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2016	115,956 kWh																			
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Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the adequate QA/QC procedures were implemented by all the stakeholders, namely, the Grid Authority, the PP and the O&M Contractor. The monthly Joint meter reading is taken by the representatives of TNEB (State utility) in the presence of NSL officials in the form of JMRS.																			

	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	No such issues.	
Findings	CAR #1 to CAR #2 was raised and resolved		
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology/10/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.		

Parameters fixed ex ante:

EF_y ; tCO_{2e}/MWh : it is the combined margin emission factor of southern grid fixed at the time of project registration the mentioned value of $0.9269 tCO_{2e}/MWh$ is consistent with the registered PD/01/.

Calibration of meters:

During the verification assessment of the project activity, accuracy of all the metering have been checked and found appropriate. The installation and working conditions of the meters were checked during the on-site inspection and were found to be satisfactory. Details of meters are provided in below table:

HTS C No.	Meter Serial No	Meter Make	Accuracy class	Calibration Date	Calibration Delay Period	Calibration frequency
751	KAB 10100	Secure	0.5s	27/10/2010	Feb 2010 to Oct 2010	Annual
	TN902583	Secure	0.2s	23/11/2011	Oct 2011 to Nov 2011	
	TN902583	Secure	0.2s	06/04/2014	Nov 2012 to April 2014	
	4321904	Genus	0.2s	08/05/2017	April 2015 to April 2016	
752	04954987	Elster	0.5s	27/10/2010	Feb 2010 to Oct 2010	Annual
	TN902589	Secure	0.2s	14/12/2011	Oct 2011 to Dec 2011	
	TN902589	Secure	0.2s	06/04/2014	Dec 2012 to April 2014	
	4321911	Genus	0.2s	08/05/2017	April 2015 to April 2016	
754	04954988	Elster	0.5s	27/10/2010	Feb 2010 to Oct 2010	Annual
	TN902584	Secure	0.2s	23/11/2011	Oct 2011 to Nov 2011	
	TN902584	Secure	0.2s	06/04/2014	Nov 2012 to April 2014	
	4321912	Genus	0.2s	08/05/2017	April 2015 to April 2016	
788	TNB 03828	Secure	0.5s	27/10/2010	Feb 2010 to Oct 2010	Annual
	HT2110233	Wallaby	0.2s	14/09/2011	No Delay	
	HT2110233	Wallaby	0.2s	06/04/2014	Sep 2012 to April 2014	
	4321910	Genus	0.2s	08/05/2017	April 2015 to April 2016	
753	04691234	Elster	0.5s	27/10/2010	Feb 2010 to Oct 2010	Annual
	HT2110234	Wallaby	0.2s	06/04/2014	Oct 2011 to April 2014	
	15198077	L&T	0.2s	25/11/2015	April 2015 to Nov 2015	
	4321907	Genus	0.2s	08/05/2017	No Delay	
808	04681455	Elster	0.5s	27/10/2010	Feb 2010 to Oct 2010	Annual
	HT2110232	Wallaby	0.2s	14/09/2011	No Delay	
	HT2110232	Wallaby	0.2s	06/04/2014	Sep 2012 to April 2014	
	4321909	Genus	0.2s	08/05/2017	April 2015 to April 2016	
728	KAB05700	Secure	0.5s	27/10/2010	Feb 2010 to Oct 2010	Annual
	TN902590	Secure	0.2s	22/11/2011	Oct 2011 to Nov 2011	
	TN902590	Secure	0.2s	06/04/2014	Nov 2012 to April 2014	
	4321903	Genus	0.2s	08/05/2017	April 2015 to April 2016	
755	04862925	Elster	0.5s	27/10/2010	Feb 2010 to Oct 2010	Annual
	TN902591	Secure	0.2s	06/04/2014	Oct 2011 to April 2014	

HTS C No.	Meter Serial No	Meter Make	Accura cy class	Calibration Date	Calibration Delay Period	Calibrati on frequen cy
	4321905	Genus	0.2s	08/05/2017	April 2015 to April 2016	
690	04862925	Elster	0.5s	27/10/2010	Feb 2010 to Oct 2010	Annual
	TN902592	Secure	0.2s	06/04/2014	Oct 2011 to April 2014	
	4322619	Genus	0.2s	08/05/2017	April 2015 to April 2016	

It is evident from the above table that calibration for the meters was not carried out as per the frequency mentioned in the registered monitoring plan. As verified through the calibration certificates, calibration of meters was not conducted on due date. Therefore delay in calibration is considered as above table.

Accordance with the guidelines outlined under paragraph 369(a) of VVS version 01, an error factor had to be applied for the measured values in the delayed calibration period. However, the monthly statements issued by the state utility only provide the calculated value of electricity exported and imported applied for the project activity. Hence the error factor negative (-ve) i.e. 0.2% is applied for export values (therefore deduction of 0.2% from the exported value for delay month) and positive (+ve) i.e. 0.2% for import values (therefore, addition of 0.2% for the import value for delay month) . The approach followed by the PP was found to be conservative and appropriate, hence accepted.

Meters used to measure the parameters are of accuracy class 0.2s, as verified through calibration certificates/07/ and also physical inspection during the site visit. The CEA Notification No. 502/70/CEA/DP&D dated 17/03/2006 and its amendments Notified on 26/06/2010 No. 502/6/2009/DP&D/D-I /16/ which is considered as national standard, mentions that for voltage of 650 V up to 33 kV, 0.5s accuracy class or above is recommended. Hence, the accuracy classes of 0.2s for the energy meters installed at the project activity site are found to be appropriate.

The details of monitoring equipment are involved in the project activity and their calibration details/07/ are mentioned in the table under section 3.3 of the VCS MR/05/. The meters have been physically inspected during the site visit and the meter details are found to be consistent with that observed during the site visit. The CEA Notification No. 502/70/CEA/DP&D dated 17/03/2006/16/ which is considered as national standard mentions that "All interface meters shall be tested at least once in five years." Hence, the stipulated calibration frequency once in a year is appropriate.

The assessment team has verified the monthly joint meter reading report issued by respective state utility and confirmed that only the data recorded through main meters is used to calculate net electricity supplied to the grid by the WTGs belongs to particular developer and consequently for ER calculations. As verified through the calibration certificates, that meters were working satisfactorily during the current monitoring period. The registered VCS PD/01/ & MR /05/ and site visit observations confirm that the metering equipment are sealed and maintained by the state utility.

In view of the above discussion the assessment team able to confirm that evidence used to determine the GHG reductions and removals are sufficient and appropriate with respect to quality and quantity.

GHG Calculations

The emission reduction as per the applied methodology equals the baseline emissions (project emissions and leakage emissions for such project activities is considered zero). The formula provided for the calculation of baseline emissions is:

$$BE_y = EG_y * EF_y$$

Where:

BE_y : Baseline emissions in year y (tCO₂e/yr)

EG_y : Electricity supplied by the project activity to the grid in year y (MWh/yr)

EF_y : Combined Margin (CM) Emission Factor of Southern grid (tCO₂e/MWh)

$$\text{Thus, } BE_y = EG_y * EF_y$$

$$\text{Thus, } BE_y = 189,295 \text{ MWh} * 0.9269 \text{ tCO}_2\text{e/MWh}$$

$$= 175,420 \text{ tCO}_2 \text{ e}$$

The verification team confirms that appropriate methods and formulae for calculating baseline emissions have been followed. The assumptions, emission factors and default values that were applied in the calculations are justified. All the data were made available and have monitored as per required monitoring frequency. The means of verification for the values of parameters, used for baseline emission calculation, is described above.

4.4 Non-Permanence Risk Analysis

Not applicable for the project activity.

5 SAFEGUARDS

5.1 No Net Harm

Not applicable for this verification.

5.2 Local Stakeholder Consultation

Not applicable for this verification.

6 VERIFICATION CONCLUSION

LGAI Technological Center, S.A. (also referred to as Applus+ LGAI), contracted by M/s Nuziveedu Seeds Limited, to perform the independent verification of the emission reductions for the VCS project activity (VCS ID- 682) "Wind Power Project at Anthiyur, Tamil Nadu" in India for the monitoring period 08/02/2010 – 31/03/2016 as reported in the Monitoring Report Version 3.0 dated 13/12/2017. The Wind World (India) Limited is responsible for the collection of data in

accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

It is our responsibility to express an independent verification statement on the reported GHG emission reductions from the project activity

Applus+ LGAI commenced the verification on the basis of the baseline and monitoring methodology AMS I D version 14, the monitoring plan contained in the registered VCS PD Version 02, dated 27/10/2009 and VCS guidelines version 3.7, Monitoring Report Version 3.0 dated 13/12/2017 as per the process described under Section 2 of this report.

Applus+ LGAI verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. Applus+ LGAI planned and performed the verification by obtaining evidence and other information and explanations that Applus+ LGAI considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In our opinion the GHG emissions reductions reported for the project activity for the period 08/02/2010 – 31/03/2016 are fairly stated in the Monitoring Report Version 3.0 dated 13/12/2017. The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology AMS I D, Version 14, and the VCS standard.

Verification period: From 08/02/2010 – 31/03/2016 (including both days)

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)
2010	34,653	0	0	34,653
2011	31,994	0	0	31,994
2012	38,597	0	0	38,597
2013	29,757	0	0	29,757
2014	23,149	0	0	23,149
2015	15,286	0	0	15,286
2016	1,984	0	0	1,984
Total	175,420	0	0	175,420

APPENDIX 1: DOCUMENT REFERENCES

S.No	Title of Document	Version	Date
1.	Registered VCS PD	2.0	27/10/2009
2.	VCS Validation Report	Report No: 53608508-08/650	15/11/2009
3.	VCS Verification report (Monitoring period: 01/04/2006- 07/02/2010)	3.0	16/12/2010
4.	VCS Monitoring Report	1.0	20/03/2017
5.	VCS Monitoring Report (Final)	3.0	13/12/2017
6.	ER spread sheet (corresponding to the final monitoring report)	2.0	30/11/2017
7.	Certificates of Calibration for all the meters belongs to project activity	-	-
8.	Monthly joint meter reading report issued by state TNEB	-	08/02/2010 to 31/03/2016
9.	Invoice issued by PP to respective state TNEB	-	08/02/2010 to 31/03/2016
10.	"Grid connected Renewable Electricity Generation", AMS I D,	14	-
11.	CEA Database	version 4	-
12.	Commissioning certificate for all the WTGs of the project activity issued by state electricity authority	-	-
13.	Power Purchase Agreements signed between Project Proponent and respective state electricity authority	-	-
14.	VCS webpage for the project, VCS ID 682; http://www.vcsprojectdatabase.org/#/project_details/682	-	Last accessed on 30/11/2017
15.	Letter of declaration dated from PP regarding not having created or sought any other form of environmental credit for the same period	-	-
16.	Central Electricity Authority (Installation and Operation of Meters) Regulations Notified on 17/03/2006 No. 502/70/CEA/DP&D Amendments Notified on 26/06/2010 No. 502/6/2009/DP&D/D-I	-	-
17.	VCS Standard	Version 3.7	21/06/2017
18.	VCS Program Guide	Version 3.7	21/06/2017
19.	On site assessment –interviews of staff personnel, photographs, physical inspection of monitoring system	-	-
20.	VCS Monitoring Report	2.0	30/11/2017

APPENDIX 2: ABBRIVATIONS

Abbreviations	Full texts
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM PCP	Clean Development Mechanism Project Cycle Procedure
CDM PS	Clean Development Mechanism Project Standard
CDM VVS	Clean Development Mechanism Validation and Verification Standard
EB	Executive Board
EF	Emission Factor
EPC	Engineering ,Procurement and Construction
ER	Emission Reductions
CEA	Central Electricity Authority
CER	Certified Emission Reduction
CL	Clarification Request
DOE	Designated Operational Entity
DNA	Designated National Authority
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
GOI	Government of India
IPCC	Intergovernmental Panel on Climate Change
JMR	Joint Meter Reading
MP	Monitoring Plan
MR	Monitoring Report
MWh	Megawatt hour
PDD	Project Design Document
PPA	Power Purchase Agreement
PP	Project Participant
PRC	Post Registration Changes
PS	Project Standard
RMP	Revised Monitoring Plan
SLDC	State Load Dispatch Center
TR	Technical Review
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard
UNFCCC	United Nations Framework Convention on Climate Change
WTG	Wind Turbine Generator
WEC	Wind Energy Convertor

APPENDIX 3: Findings Overview

Table 1. Remaining FAR from validation and/or previous verification

FAR ID	NA	Section no.	NA	Date :DD/MM/YYYY
Description of FAR				
No FAR from validation				
Project participant response				Date :DD/MM/YYYY
NA				
Documentation provided by project participant				
NA				
DOE assessment				Date: DD/MM/YYYY
NA				

Table 2. CL from this verification

CL ID	NA	Section no.	NA	Date : DD/MM/YYYY
Description of CL				
NA				
Project participant response				Date : DD/MM/YYYY
NA				
Documentation provided by project participant				
NA				
DOE assessment				Date: DD/MM/YYYY
NA				

Table 3. CAR from this verification

CAR ID	01	Section no.	1.4	Date : 29/11/2017
Description of CAR				
1. Start Date of Monitoring Period is not consistently mentioned the MR and ER sheet. 2. The PP is requested to clarify how the value of end date of monitoring period calculated in ER sheet and similarly monitoring parameters value for last month of monitoring period is not correctly applied, please clarify?				
Project participant response				Date : 30/11/2017
1. The start date of monitoring period is corrected now. 2. The end date value has been adjusted by 7 days as reading was taken on every 7th Day of Month. Hence for obtain value till 31st March 2016; the value of 7 days has been deducted from Monthly value in ER sheet.				
Documentation provided by project participant				
MR version 02 and ER version 02				
DOE assessment				Date: 12/12/2017
The PP has corrected the start & end date of monitoring period in MR and ER sheet, hence accepted. Furthermore, the PP is requested to provide data for each year in section 3.2 of the MR as the parameter is for electricity in every year.				
Project participant response				Date : 13/12/2017
The data is provided year wise in section 3.2 for respective parameters.				
Documentation provided by project participant				
MR version 03, 13/12/2017				
DOE assessment				Date: 13/12/2017

The PP has provided the yearly monitoring data in section 3.2 of the revised MR version 03, same is found to be correct, hence accepted. Therefore, CAR#1 satisfactorily closed.

CAR ID	02	Section no.	3.1	Date : 11/09/2017
Description of CAR				
During site visit it was observed that the meters were replaced during current monitoring period , so the PP is requested to provide further details of new energy meters in section 3.3 of MR with latest validity of calibration .				
Project participant response				Date : 30/11/2017
The calibration details has been provided in MR section 3.3 and there is delay in calibration , so appropriate delay has been applied in export and import value for respective month as per VVS for PA , Version 01 369 (a) of CDM				
Documentation provided by project participant				
MR version 02 and ER version 02				
DOE assessment				Date: 30/11/2017
The PP has correctly applied the correction factor for delay period in the revised ER sheet and reported in the MR, found in line with the requirement of VVS for PA , Version 01 369 (a) of CDM , hence accepted. CAR #2 is closed.				

Table 4. FAR from this verification

FAR ID	NA	Section No.	NA	Date :DD/MM/YYYY
Description of FAR				
No FAR raised				
Project participant response				Date :DD/MM/YYYY
NA				
Documentation provided by project participant				
NA				
DOE assessment				Date: DD/MM/YYYY
NA				