

WIND BASED POWER GENERATION BY PANAMA WIND ENERGY GODAWARI PRIVATE LIMITED, PUNE IN THE STATE OF MAHARASHTRA, INDIA



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Project Title	Wind Based Power Generation by Panama Wind Energy Godawari Private Limited, Pune in the State of Maharashtra, India
Version	02
Report ID	TQC_2018

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Client	Panama Wind Energy Godawari Private Limited
Pages	23
Date of Issue	16/02/2018

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Summary:

Verification purpose: The purpose of the project activity is to generate power using renewable energy source i.e. wind potential and converts it into kinetic energy using Wind turbines, which drives the alternators to generate energy. The generated electricity is being exported to the regional grid system which is under the purview of the NEWNE grid of India which is dominated by mainly fossil fuel fired power plants.

The total installed capacity of the project is 80 MW; which involves operation of 40 Wind Turbine Generators (WTGs) with capacity of 2 MW each located at Maharashtra state in India and the project is promoted by **Panama Wind Energy Godawari Private Limited**.

The project is registered with VCS with Project ID 1523¹. Start date of the project activity is the 31/03/2014. The monitoring period for this VCS verification is chosen from 02/02/2017 to 01/02/2018 (including both days) and the project activity achieved **112,553** tCO₂e emission reductions during this monitoring period.

A risk based approach has been followed to perform this verification activity. In the course of verification, 04 Corrective Action request (CAR) and 00 Clarification Requests (CLs) 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 *LGAI Technological Center S.A. (Applus+ Certification)* with sufficient evidence to verify the fulfilment of the stated criteria of VCS.

¹ http://www.vcsprojectdatabase.org/#!/project_details/1523

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1 INTRODUCTION

1.1 Objective

LGAI Technological Center S.A. (hereafter referred as *Applus+ Certification*) has been appointed by “Panama Wind Energy Godawari Private Limited” to perform the 3rd periodic verification of the “Wind Based Power Generation by Panama Wind Energy Godawari Private Limited, Pune in the State of Maharashtra, India” 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 Validation 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 “ACM0002 - Version 16.0”
- the project's monitoring plan is assessed against “ACM0002 - Version 16.0”
- 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 for project activities Version 01.0
- CDM project standard for project activities Version 01.0
- CDM project cycle procedure for project activities Version 01.0
- VCS standard v3.7
- VCS 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 for project activities Version 01.0, VCS PD Version 02 dated 15/03/2016 and Final Validation report version 01 dated 17/03/2016, CDM project standard for project activities Version 01.0, CDM project cycle procedure for project activities Version 01.0 and VCS 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, 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 purpose of the project activity is to generate energy electricity by the utilization of wind velocity and further selling the generated energy to the respective Grid. In this process there is no consumption of any fossil fuel and hence it does not lead to any greenhouse gas emissions. Thus, electricity would be generated through sustainable means without causing any negative impact on the environment.

Verification purpose: The purpose of the project activity is to generate power using renewable energy source i.e. wind potential and converts it into kinetic energy using Wind turbines, which drives the alternators to generate energy. The generated electricity is being exported to the regional grid system which is under the purview of the NEWNE grid of India which is dominated by mainly fossil fuel fired power plants..

The total installed capacity of the project is 80 MW; which involves operation of 40 Wind Turbine Generators (WTGs) with capacity of 2 MW each located at Maharashtra state in India and the project is promoted by **Panama Wind Energy Godawari Private Limited**.

Start date of the project activity is the 31/03/2014. The monitoring period for this VCS verification is chosen from 02/02/2017 to 01/02/2018 (including both days) and the project activity achieved 112,553 tCO₂e emission reductions during this monitoring period.

2 VERIFICATION PROCESS

2.1 Method and Criteria

Verification Scope: The scope is defined as an independent and objective review of the Monitoring report (MR) prepared as per the registered PD and registered approved methodology ACM0002 - Version 16.0. The 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 3.7, including the approved baseline and monitoring methodology ACM0002 - Version 16.0. The verification was based on the requirements in the CDM validation and verification standard for project activities Version 01.0, CDM project standard for project activities Version 01.0, CDM project cycle procedure for project activities Version 01.0 and VCS guideline and standard version 3.7.

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.

Verification Process: The project assessment is based on the CDM validation and verification standard for project activities Version 01.0 and VCS standard and guideline 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 the Monitoring report against the registered PD and final validation 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.

The verification checklist consists of three tables. The different columns in these tables are described in the tables below:

Verification Checklist Table 1: Mandatory Requirements			
Requirement	Reference	Conclusion	Cross reference
The requirements which the project must meet.	Gives reference to the legislation or agreement where the requirement is found.	This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the draft verification report.	Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is verified. This is to ensure a transparent verification process.

Verification Checklist Table 2: Requirement checklist				
Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion

The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organized in several different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	Gives reference to documents where the answer to the checklist question or item is found.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	Conclusions are presented based on the assessment of the first MR version. This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). Clarification is used when the assessment team has identified a need for further clarification. Forward action request to highlight issues related to project implementation that requires review during the further verifications.	Conclusions are presented in the same manner based on the assessment of the final MR version and further documents including assumptions presented in the documentation.
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Verification Checklist Table 3: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action requests	Ref. to checklist question in table 1&2	Summary of project owner response	Validation/Verification conclusion
If the conclusions from the draft verification are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	Reference to the checklist question number in Table 1&2 where the Corrective Action Request or Clarification Request is explained.	The responses given by the Client or other project participants during the communications with the assessment team should be summarized in this section.	This section should summarize the assessment team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".

Appointment of the assessment team

According to the sectoral scopes / technical area and experiences in the sectoral or national business environment, Applus+ Certification has composed a project assessment team in accordance with the appointment rules in Applus+ Certification. The composition of assessment team has to 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 as below:

- Leader Auditor (LA)
- Auditor (A)
- Auditor Trainee (T)

- Technical Experts (E)
- Internal Technical Review (ITR)

It is required that the sectoral scope / technical area related to the methodology has to be covered by the assessment team.

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

Document review

The Monitoring report submitted by the Client was reviewed against the approved methodology, VCS PD Version 02 dated 15/03/2016 and Final Validation report version 01 dated 17/03/2016 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 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 in Section 2.3.

Resolution of Clarification and Corrective Action Request

The objective of this phase of the Verification was to resolve the requests for corrective actions and clarification and any other outstanding issues 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 3 submitted by PP on 12/02/2018 serves as the basis for the final assessment presented. Additional changes to the project during the 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 verification of the final documentation including the 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.	Deshmukh	Ravindra	Site Engineer	29/01/2018	Implementation of the project, monitoring and emission reduction calculations	Dr. Atul Takarkhede
2.	Shinde	Jayant	Site Engineer	29/01/2018		

2.4 Site Inspections

Duration of on-site inspection: 29/01/2018				
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 PD is actually practised onsite. Also assessment team checked any change in host country criteria which may affect the baseline of the project activity.	Georai, Maharashtra	29/01/2018	Dr. Atul Takarkhede

2.5 Resolution of Findings

The objective of this phase of the 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 3 submitted by PP on 12/02/2018 serves as the basis for the final assessment presented. Additional changes to the project during the 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	00	00

Areas of validation and verification findings	No. of CL	No. of CAR	No. of FAR
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	01	00
- Calibration details	00	03	00
- Monitoring plan	00	00	00
Others (please specify)	00	00	00
Total	00	04	00

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

2.5.1 Forward Action Requests

This is 3rd periodic verification of the project activity and no FAR rose from validation and previous verifications.

2.6 Eligibility for Validation Activities

This section is not applicable as the project has undergone verification only.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

This section is not applicable as the project is registered under VCS only.

3.2 Methodology Deviations

This section is not applicable as there is no methodology deviation observed during this verification period.

3.3 Project Description Deviations

This section is not applicable as there is no project deviation observed during this verification period.

3.4 Grouped Project

This section is not applicable as the project has undergone verification only.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

During the verification site visit it was concluded that the project is implemented as per the instruction of the registered PD and Final Validation report. During the current monitoring period it was observed that no unforeseen situation evolved which can impact the operation of the project activity. Breakdown summary is submitted by PP for the WTGs. Scheduled maintenance was carried out as per the instruction of the manufacturer and the same is acceptable to the assessment team.

The total installed capacity of the project is 80 MW; which involves operation of 40 Wind Turbine Generators (WTGs) with capacity of 2 MW each. The technical parameters have been verified with the nameplates as well as the technical specifications of WTGs.

The WTG wise latitudes and longitudes are confirmed during site visit as below:

Sr. No.	Location No.	Commissioning date	Village	Taluka	District	Latitude (D° M' Sec")	Longitude (D° M' Sec")
1.	G01	07/10/2014	Mulukwadi	Georai	Beed	N19 11 35.6	E75 43 38.4
2.	G02	07/10/2014	Mulukwadi	Georai	Beed	N19 11 12.3	E75 42 57.5
3.	G03	07/10/2014	Mulukwadi	Georai	Beed	N19 11 50.0	E75 43 19.7
4.	G04	07/10/2014	Mulukwadi	Georai	Beed	N19 11 30.1	E75 43 13.9
5.	G05	06/09/2014	Khothi	Georai	Beed	N19 13 35.5	E75 41 23.4
6.	G06	07/10/2014	Mulukwadi	Georai	Beed	N19 11 59.1	E75 43 35.4
7.	G07	07/10/2014	Mulukwadi	Georai	Beed	N19 11 20.6	E75 43 40.8
8.	G08	07/10/2014	Mulukwadi	Georai	Beed	N19 11 59.5	E75 43 07.2
9.	G09	07/10/2014	Mulukwadi	Georai	Beed	N19 12 04.9	E75 42 37.4
10.	G10	07/10/2014	Mulukwadi	Georai	Beed	N19 12 24.6	E75 43 13.1
11.	G11	07/10/2014	Mulukwadi	Georai	Beed	N19 11 35.6	E75 43 38.4
12.	G12	07/10/2014	Manmodi	Georai	Beed	N19 12 38.0	E75 43 18.6
13.	G13	07/10/2014	Manmodi	Georai	Beed	N19 12 23.5	E75 42 36.7
14.	G14	06/09/2014	Manmodi	Georai	Beed	N19 12 50.5	E75 42 24.3
15.	G15	06/09/2014	Manmodi	Georai	Beed	N19 12 59.8	E75 42 10.8
16.	G16	07/10/2014	Manmodi	Georai	Beed	N19 13 17.1	E75 42 10.1
17.	G17	06/09/2014	Manmodi	Georai	Beed	N19 13 22.3	E75 41 58.6
18.	G18	07/10/2014	Khothi	Georai	Beed	N19 13 29.6	E75 42 29.3
19.	G19	07/10/2014	Manyarwadi	Georai	Beed	N19 13 41.9	E75 42 19.2
20.	G20	07/10/2014	Khothi	Georai	Beed	N19 13 45.5	E75 42 59.5
21.	G21	05/12/2014	Rajpimpri	Georai	Beed	N19 14 06.3	E75 41 40.6
22.	G22	06/09/2014	Rajpimpri	Georai	Beed	N19 13 54.1	E75 41 27.6
23.	G23	06/09/2014	Rajpimpri	Georai	Beed	N19 13 46.6	E75 41 03.1
24.	G24	31/03/2014	Rajpimpri	Georai	Beed	N19 13 34.5	E75 40 24.8
25.	G25	31/03/2014	Bangali Pimpla	Georai	Beed	N19 13 23.9	E75 40 11.5
26.	G26	25/07/2014	Sindkhed	Georai	Beed	N19 12 40.0	E75 37 28.9
27.	G27	25/07/2014	Kombadwadi	Georai	Beed	N19 13 09.5	E75 40 21.9
28.	G28	25/07/2014	Kombadwadi	Georai	Beed	N19 13 25.4	E75 39 28.6
29.	G29	31/03/2014	Devimpri	Georai	Beed	N19 13 43.7	E75 39 29.9
30.	G30	31/03/2014	Kombadwadi	Georai	Beed	N19 13 51.7	E75 39 06.1
31.	G31	31/03/2014	Sushi	Georai	Beed	N19 13 57.4	E75 39 33.0

Sr. No.	Location No.	Commissioning date	Village	Taluka	District	Latitude (D° M' Sec")	Longitude (D° M' Sec")
32.	G32	25/07/2014	Sushi	Georai	Beed	N19 12 16.2	E75 37 44.2
33.	G33	31/03/2014	Sushi	Georai	Beed	N19 12 59.5	E75 38 47.3
34.	G34	31/03/2014	Sushi	Georai	Beed	N19 13 14.9	E75 38 57.3
35.	G35	31/03/2014	Sushi	Georai	Beed	N19 13 12.2	E75 38 26.2
36.	G36	31/03/2014	Kumbhejalgao n	Georai	Beed	N19 13 27.1	E75 38 20.9
37.	G37	31/03/2014	Sushi	Georai	Beed	N19 13 34.4	E75 38 00.3
38.	G38	25/07/2014	Kumbhejalgao n	Georai	Beed	N19 12 49.7	E75 38 08.6
39.	G39	31/03/2014	Bangalipimpla	Georai	Beed	N19 13 04.7	E75 37 53.8
40.	G40	31/03/2014	Mulukwadi	Georai	Beed	N19 12 58.0	E75 37 31.5

By comparing the actual ER claimed in this monitoring period with the estimate in the registered VCS PD (136,936 tCO₂e for the monitoring period), the actual emission reductions (112,553 tCO₂e for the monitoring period) are lower than what is stated in the registered VCS PD which surely will not lead to the overestimation of VERs.

The assessment team confirmed that there is no proposed or actual change to the project design during this monitoring period.

All required equipments and procedures are available and implemented in an appropriate manner.

It was observed that the monitoring plan was implemented as per the requirement of the registered PD, FVR and approved methodology ACM0002 - Version 16.0. The organisational role and responsibility as mentioned in the registered PD is followed onsite. All the monitoring equipment was calibrated as per the specified interval in the registered PD. All the emergency preparedness as mentioned in the registered PD is followed onsite and no discrepancies were found regarding the same.

Start date of the project activity is 31/03/2014. The Project has applied for the CDM under the Kyoto protocol in year 2014, however currently the PP is not willing to go ahead with CDM.²

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

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 1 was raised during the verification. The description of the CAR and its closure is described below in Appendix 2 of this report.

²UNFCCC web link: <http://cdm.unfccc.int/Projects/Validation/DB/3EXK45ZD9TYCX75US5098OUPIT809D/view.html>

Conclusion	Ex-ante Parameter: $EF_{grid,CM,y}$ = Parameter is fixed ex-ante for the entire crediting period and as per the validated VCS PD same is fixed 0.9770 tCO₂/MWh. Verification team found same was used in the ER calculations. Baseline Emissions: The baseline Emissions for a given year is calculated by multiplying the energy baseline with the grid emission factor. The grid in this case would be the 'Indian Grid' Formula Used:- $BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$ Where: BE_y = Baseline emissions in year y (t CO₂/yr) $EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr) $EF_{grid,CM,y}$ = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (t CO₂/MWh) $EG_{PJ,y}$ = The verification team has checked the entire monthly JMR reports for net electricity generated & supplied to the grid and crosschecked same with the invoices raised by PP towards State Utilities for the monitoring period. All values are found correct. All the parameters are monitored and recorded as per the monitoring plan in the registered VCS PD. The verification team has crosschecked the revised emission reduction sheet and monitoring report data with the JMR sheet and invoice and found all the values are matching. PE_y = As per para 37 of ACM0002 - Version 16.0, all renewable energy power generation project activities, emissions due to the use of fossil fuels for the backup generator can be neglected. As the project activity involved wind project emissions (PE_y) are taken as zero. Leakage: As per para 60 of ACM0002 - Version 16.0, Leakage emissions are not considered for the project activity.
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4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

Means of verification	The verification team checked the break down log for the monitoring period. During the verification site visit the feeder wise location of the WTGs is also checked. The Calibration details of the monitoring meters are also checked with calibration certificates.
Findings	CAR 2, CAR 3 and CAR 4 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 tri-vector bi-directional energy meters of Secure Make; accuracy class 0.2s (main and check) at the State Electricity Board (SEB) substation. These meters record several parameters including electricity exported & imported. These electricity meters are being used by state electricity board for JMR (Joint Meter Reading) electricity generation statements. During commissioning of the WTGs monitoring meters of accuracy class i.e. 0.2s were installed. The meters are monitored continuously & cumulative readings are taken at the end of the month by joint meter reading procedure. These are sealed by State

	Utilities to avoid malfunctioning with meter readings. Meter is calibrated yearly by the meter testing division of the state utility in the presence of O&M Contractor / investor's representatives and State Utilities officials to ensure the working of meter within permissible limits, however, calibration frequency and schedule is under the complete discretion of State Utility and PP do not have control on it. The calculation of net electricity supplied to grid is under purview of state electricity board and PP does not have control on it. Calibration details of the monitoring meters checked with calibration certificates submitted by PP and found that calibration frequency of 5 years is complied. The break down log is checked and there is no major breakdown during the monitoring period. No unforced error observed.
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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	
1.	No risk	Nil	Not applicable	Complete verification of all the values indicated in the emission reduction spreadsheet in documents such as JMR and Invoices. No sampling approach adopted and complete site and verification is performed by the assessment team.

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 in Air or water quality onsite.

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 project description form the registered VCS PD. Assessment team confirmed the same during the verification site visit.

6 VERIFICATION CONCLUSION

Applus+ Certification has been engaged by Panama Wind Energy Godawari Private Limited to perform the 3rd periodical verification of the “Wind Based Power Generation by Panama Wind Energy Godawari Private Limited, Pune in the State of Maharashtra, India”

The Panama Wind Energy Godawari Private 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 ACM0002 - Version 16.0.

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 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 VCS 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: 02/02/2017 to 01/02/2018 (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)
02/02/2017 to 31/12/2017	109,799	0	0	109,799
01/01/2018 to 01/02/2018	2,754	0	0	2,754
Total	112,553	0	0	112,553

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.	NA	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 wind turbine generators from manufacturers	Manufacturer technical specifications	Project participant
4.	NA	Power Purchase agreement for the project activity	NA	Project participant
5.	NA	VCS PD	Version 02, dated 15/03/2016	Project participant
6.	NA	Final VCS Validation report	Version 01 dated 17/03/2016	Project participant
7.	NA	Final Monitoring report for 2 nd verification	Version 02 Dated 18/02/2017	Project participant
8.	NA	Final 2 nd VCS Verification report	Version 02 Dated 19/02/2017	Project participant
9.	NA	Joint Validation & 1 st Verification Report	Version 01 dated 17/03/2016	Project participant
10.	NA	Final Monitoring report for 1 st verification	Version 02, dated 15/03/2016	Project participant
11.	NA	The operational lifetime of the project activity from the manufacturer=(Technical specifications)	Manufacturer technical specifications	Project participant
12.	NA	Ministry of Environment and forest: www.envfor.nic.in 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
13.	NA	Tools/ guidelines used in the project activity • Tool to determine the remaining lifetime of the project activity in line with Annex 15 EB 50 • Tool to calculate the emission factor for an electricity system • Glossary of CDM terms version 07 • VCS verification report template version 03.4	UNFCCC CDM web site	UNFCCC
14.	NA	JMR records for the complete monitoring period	JMR records	Project participant
15.	NA	MR version 1 MR version 2 MR version 3	19/01/2018 08/02/2018 12/02/2018	Project participant
16.	NA	Emission Calculation sheet version 01	19/01/2018	Project

No.	Author	Title	References to the document	Provider
		Revised Emission Calculation sheet version 02 Revised Emission Calculation sheet version 03	08/02/2018 12/02/2018	participant
17.	NA	Invoices for the complete monitoring period	Invoice	Project participant
18.	NA	Break down details of the complete monitoring period	Log sheet	Project participant

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

Project Implementation Status

CAR ID		Section no.		Date:
Description of CAR				
NA				
Project participant response				Date:
Documentation provided by project participant				
DOE assessment				Date:

Accuracy of GHG Emission Reduction and Removal Calculations

CAR ID	01	Section no.	Section 4 of MR	Date: 06/02/2018
Description of CAR				
Emission reduction values reserved for crosscheck of Export & Import value with JMR and invoices.				
Project participant response				Date: 08/02/2018
Emission Reduction values has been cross checked with Monthly JMRs, changes were addressed.				
Documentation provided by project participant				
ER Sheet V2				
DOE assessment				Date: 12/02/2018
Emission reduction sheet checked. Export values for the month of Feb. 2017 have been apportioned now. Import values are considered for complete month for calculations of Net Export to the grid. This is conservative approach and hence accepted by DOE. Further, export and import values for the month of May 2017 for Feeder 4 have been corrected. However, according to registered PD " <i>The value of net electricity generation supplied to the grid as per Joint Meter Reading Report forms the basis for calculation of the emission reductions; which can be cross checked from the invoice raised to DISCOM.</i> " MR and ER sheet failed to incorporate such process.				
Project participant response				Date: 12/02/2018
Revised MR and ER Sheet which is inlined with the registered PD is attached. Invoice values has been updated in the ER sheet which is equivalent to the net export values as per JMR and the subsequent changes in the MR V3.				
Documentation provided by project participant				
MR V3, ER Sheet V3				
DOE assessment				Date: 16/02/2018
Version 3 of ER sheet is updated for the crosscheck of JMR values with Invoices and both values found inline. Section 3.2 of MR revised accordingly. CAR closed.				

Quality of Evidence to Determine GHG Emission Reductions and Removals

CAR ID	02	Section no.	Section 3.3 of MR	Date: 06/02/2018
Description of CAR				
The calibration frequency of monitoring meters is fixed once in five years as per validation report, approved VCS-PD based on the national regulation i.e. CEA guidelines. However, section 3.3 of MR states calibration frequency as once in 3 years. Correction requested.				
Project participant response				Date: 08/02/2018
Section 3.3 of MR has been revised.				
Documentation provided by project participant				
MR V2				
DOE assessment				Date: 09/02/2018
The section has been corrected appropriately. CAR closed.				

CAR ID	03	Section no.	Appendix 1 of MR	Date: 06/02/2018
Description of CAR				
PP requested to submit commissioning certificates of WTGs and first calibration of WTGs in year 2014.				
Project participant response				Date: 08/02/2018
Commissioning certificate having the initial meter calibration details is being provided.				
Documentation provided by project participant				
Calibration certificates (having details of initial meter calibration)				
DOE assessment				Date: 09/02/2018
Commissioning certificates and calibration certificates for year 2016 has been submitted by PP. Appendix 1 of MR has been corrected accordingly. CAR closed.				

CAR ID	04	Section no.	Appendix 1 of MR	Date: 06/02/2018
Description of CAR				
Corrections is requested in Appendix 1 for corresponding calibration dates of Main & check meters separately and also details of calibration carried out recently including year 2016.				
Project participant response				Date: 08/02/2018
Appendix 1 has been revised with 2016 meter details				
Documentation provided by project participant				
ER V2 MR V2				
DOE assessment				Date: 09/02/2018
Appendix 1 of MR has been revised appropriately. CAR 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.	Team Leader/Lead Assessor	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)	IR	Xue	Hanshen (Denny)	Applus+ Certification
2.	Approver	IR	Sendin	Juan	Applus+ Certification B.U. Managing Director

Short CVs of the Team:

- 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.
- Mr. Hanshen (Denny) Xue (Master Degree in Environmental Engineering, Bachelor Degree in Thermal Engineering) is an Auditor appointed by Applus+ Certification for the GHG project assessment. He is based on Shanghai. He has 1.5 years of work experiences in CDM project development. Before he joined Applus+ Certification, 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 ₂ e	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
JMR	Joint Metering reading
PP	Project Participant

APPENDIX 5: CALIBRATION DETAILS OF THE METERS

Calibration Details of the WTGs installed in the project activity is provided below:

WTG ID	Feeder	Date of Calibration of Main Meter	Main Meter Sr. No.	Date of Calibration of Check Meter	Check Meter Sr. No.	Calibration Compliance
Location No. - 38,26,32	Feeder No. 1	16/07/2016	5288748	27/07/2016	5288752	Yes
Location No. - 24,25,29,30,31	Feeder No. 1	16/07/2016		27/07/2016		Yes
Location No. - 21	Feeder No. 2	16/07/2016	5288749	27/07/2016	5288753	Yes
Location No. - 5,22,23	Feeder No. 2	16/07/2016	5288749	27/07/2016	5288753	Yes
Location No. - 33,34,35,36,37,39,40	Feeder No. 2	16/07/2016	5288749	27/07/2016	5288753	Yes
Location No. - 27,28	Feeder No. 2	16/07/2016	5288749	27/07/2016	5288753	Yes
Location No. - 1,2,3,4,6,7,8,10,11	Feeder No. 3	16/07/2016	5288751	27/07/2016	5288750	Yes
Location No. - 9,12,13,16,18,19,20	Feeder No. 4	16/07/2016	5288755	27/07/2016	5288754	Yes
Location No. - 17,14,15	Feeder No. 4	16/07/2016	5288755	27/07/2016	5288754	Yes