



10 MW WIND POWER PROJECT IN MAHARASHTRA BY DEEPAK FERTILIZERS AND PETROCHEMICALS CORPORATION LIMITED



Document Prepared By

LGAI Technological Center S.A. (Applus+ Certification)

Project Title	10 MW Wind Power Project in Maharashtra by Deepak Fertilizers and Petrochemicals Corporation Limited
Version	01
Report ID	Internal project ID: TQC 1121

Report Title	10 MW Wind Power Project in Maharashtra by Deepak Fertilizers and Petrochemicals Corporation Limited
Client	Deepak Fertilizers and Petrochemical Corporation Ltd.
Pages	36

Date of Issue	08/05/2021
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Summary:

Verification purpose: LGAI Technological Center S.A. (Applus+ Certification) (Hereafter referred as Applus+ Certification) has been appointed by Deepak Fertilizers and Petrochemical Corporation Ltd. to perform verification of the project activity “10 MW Wind Power Project in Maharashtra by Deepak Fertilizers and Petrochemicals Corporation Limited”. The main purpose of this verification activity is to have an independent third party for the assessment of the project design, monitoring report to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements.

The project activity involves installation of Eight (8) Wind Turbine Generators (WTGs) 1.25 MW capacity each with total capacity of 10 MW. The project activity is located in Dhule and Nandurbar district of Maharashtra, India. The turbines had been manufactured, supplied and erected by M/s Suzlon Energy Ltd (SEL). The generated electricity from WTGs is sold to the Maharashtra State Electricity Distribution Company Limited (MSEDCL) through state grid which is part of unified Indian grid.

Start date of the project activity is 29/09/2006 which is the date of commissioning of WTGs. This is the day on which WTGs were commissioned per commissioning certificate, registered VCS PD dated 29/01/2010 and CDM registered PDD version 05, dated 05/06/2009.

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 for project activities, version 02.0, review against registered VCS PD and CDM PDD, Final Validation Report, CDM Project Standard for project activities, version 02.0; CDM Project Cycle Procedure for project activities, version 02.0 and VCS program guideline Version 4.0 and VCS standard version 4.1

This is the 4th monitoring and covers the activity from 01/01/2012 to 23/04/2017 (inclusive of both

dates). The total emission reductions achieved during the monitoring period is 64,883 tCO_{2e}. The crediting period for VCS began on 24/04/2007 and ended on 23/04/2017. 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, 09 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.

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.

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.

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1 INTRODUCTION

1.1 Objective

LGAI Technological Center S.A. (Applus+ Certification) (Hereafter referred as Applus+ Certification) has been appointed by “Deepak Fertilizers and Petrochemical Corporation Ltd. Ltd.” to perform the verification of the “10 MW Wind Power Project in Maharashtra by Deepak Fertilizers and Petrochemicals Corporation Limited” under VCS standard version 4.1 and guideline version 4.0. 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 project activity against the applicable CDM and VCS requirements. In particular;

- the project's baseline is assessed against “AMS-I.D, Version 13”
- the project's monitoring plan is assessed against “AMS-I.D, Version 13”
- 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 version 4.0 and standard version 4.1
- CDM validation and verification standard for project activities, Version 02.0
- CDM Project Standard for project activities, version 02.0
- CDM project cycle procedure for project activities, version 02.0
- VCS program guideline v4.0
- VCS standard v4.1

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 is defined as an independent and objective review of the Monitoring report (MR) prepared as per the registered PD and registered approved methodology AMS-I.D version 13. 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 4.0, including the approved baseline and monitoring methodology AMS-I.D version 13. The verification was based on the requirements in the CDM validation and verification standard for project activities, Version 02.0, CDM Project Standard for project activities, version

02.0, CDM project cycle procedure for project activities, version 02.0 and VCS program guideline version 4.0 and standard version 4.1

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. 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 spread sheet. 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 the WTGs along with the substations. The verification team has reviewed all the documents like commissioning certificates, JMR, invoices etc.

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/Power plant verification conducted to arrive at positive verification conclusions.

1.4 Summary Description of the Project

The project activity involves generation of electricity through wind power plant with a capacity of 10 MW comprises 8 WTGs, each with capacity of 1.25 MW at Dhule and Nandurbar district in Maharashtra, India. The purpose of the project activity is to generate electricity by the utilization of wind energy. In this process there is no consumption of any fossil fuel and hence it does not lead to any greenhouse gas emissions. The project activity was commissioned on 29/09/2006. The electricity generated from the project activity is sold to the Maharashtra State Electricity Distribution Company Limited (MSEDCL) transmitted through state electric grid (now unified Indian grid).

The monitoring period this VCS verification covered from 01/01/2012 to 20/04/2017 (inclusive of both dates) and the project activity is achieved 64,883 tCO₂e emission reductions during this monitoring period.

Start date of the project activity is the 29/09/2006. An undertaking has been submitted by PP for double counting would never happen with any other GHG program.

The timeline for Commission of the project activity is also checked by the assessment team. Assessment team checked the Commission of WTG with the commissioning Certificates and found correct. The project is implemented as per the description in the

registered PD and CDM PDD. No event observed during the current monitoring period which can alter or deviate from the methodology requirement.

2 VERIFICATION PROCESS

2.1 Method and Criteria

Verification Process: The project assessment is based on the “CDM validation and verification standard for project activities, Version 02.0 and “VCS standard version 4.1 and program guideline version 4.0” 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.

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 presented 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
Mr. Sukanta Das	LA/TE	YES	YES	NA	YES
Mr. Jitendra Mohan Singh	A	YES	YES	NA	YES
Mr. Simon Shen	TR	YES	YES	NA	NA

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

Document review

The Monitoring report version 01 submitted by the PP was reviewed against the approved methodology, registered VCS PD, registered CDM PDD, 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

An onsite audit was conducted by Applus+ Certification. Audit team performed interviews, telephone conferences 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 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. 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 submitted by PP 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.	Jain	Suparas	PP Representative	06/04/2021	Implementation of the project and monitoring. Baseline emission calculation, achieved emission reduction for the monitoring period, monitoring process followed onsite	Sukanta Das Jitendra Mohan Singh
2	Ghose	Bibhushita	Consultant EKI Energy Service	06/04/2021	Baseline emission calculation, achieved emission reduction for the monitoring period, monitoring process followed onsite	

2.4 Site Inspections

Duration of on-site inspection: 06/04/2021				
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.	Maharashtra, India	06/04/2021	Sukanta Das Jitendra Mohan Singh

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 02 submitted by PP 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	05	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	00
Monitoring plan	00	00	00
No Net harm assessment	00	00	00
Local stakeholder consultation	00	01	00
Others (please specify	00	00	00
Total	00	09	00

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

2.5.1 Forward Action Requests

This is 4th periodic verification (2nd under VCS) of the project activity and no FAR was raised from validation and previous verification.

2.6 Eligibility for Validation Activities

This section is not applicable for present verification, as Applus+ Certification holds the accreditation for Validation of projects under this Sectoral Scope

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project activity is also registered under CDM (UNFCCC Reference Number 2540¹. PP has claimed VERs from 24/04/2007 to 15/06/2009 under VCS, CERs from 16/06/2009 to 0/06/2010 and from 01/07/2010 to 31/12/2011 under CDM. Verification team confirms that

¹ <https://cdm.unfccc.int/Projects/DB/SGS-UKL1240498237.32/view>

there is no any double accounting for same period was found. The current VCS verification is for period from 01/01/2012 to 23/04/2017. The project has neither been applied under any other mechanism except CDM and VCS, nor has been rejected by any mechanism

3.2 Methodology Deviations

This section is not applicable for present verification as no methodology deviation sought during this verification

3.3 Project Description Deviations

During this verification it was observed that the project activity is implemented as per the approved VCS PD and registered CDM PDD. Further, this is overall 4th periodic verification (2nd under VCS) and no project description deviation was sought during 4th monitoring period and also during previous monitoring periods.

3.4 Grouped Project

This is not a grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

During the onsite audit with PP representative, it was concluded that the project is implemented as per the requirement of the registered VCS PD, CDM PDD and approved monitoring plan. 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 manufactures specification which is acceptable to the assessment team.

Project location is confirmed by the assessment team through the GPS meters during onsite visit and also cross checked the same via Google software. Moreover, assessment team confirm that the latitudes and longitudes as mentioned in the VCS PD and registered CDM PDD is correct. The WTG wise latitudes and longitudes are confirmed below:

WTG Location no	Village	Taluka	District	Latitude	Longitude	Feeder
J087	Aichale	Sakri	Dhule	21°13'37.8"N	74°22'37.6"E	Jamde 5
J091	Aichale	Sakri	Dhule	21°13'52"N	74°23'07.8"E	Jamde 5

K441	Dhandane	Nandurbar	Nandurbar	21°18'33.4"N	74°20'44.2"E	Nandurbar I
K442	Dhandane	Nandurbar	Nandurbar	21°19'47.6"N	74°19'30.3"E	Nandurbar I
K513	Wankute	Nandurbar	Nandurbar	21°19'56.1"N	74°19'47.1"E	Ranala Rural
K514	Wankute	Nandurbar	Nandurbar	21°20'34.0"N	74°19'47.1"E	Ranala Rural
K478	Mandal	Nandurbar	Nandurbar	21°19'40.8"N	74°22'11.7"E	Gangapur 7
K503	Vavad	Nandurbar	Nandurbar	21°20'01.9"N	74°22'21.7"E	Nandurbar II

Assessment team also checked the commissioning certificate and confirmed that all WTGs were commissioned on 29/09/2006. The WTGs wise commissioning dates are given below:

WTG ID	Date of Commissioning
J 087	29-September-2006
J 091	29-September-2006
K 441	29-September-2006
K 442	29-September-2006
K 513	29-September-2006
K 514	29-September-2006
K 478	29-September-2006
K 503	29-September-2006

The technical parameters have been verified with the name plates as well as with the technical specifications of WTGs and also cross checked from the technical manual of the Manufactures. Assessment team confirms that the technical parameters are consistent with the registered VCS PD and registered CDM PDD.

The major technical specifications of the WTG are as follows:

Sr. No.	Particulars	Specifications
1.	Rotor diameter	69.1 m
2.	Hub height	74 m
3.	Installed electrical output	1250 kW
4.	Cut-in wind speed	3 m/s
5.	Rated wind speed	12 m/s
6.	Cut-out wind speed	20 m/s
7.	Rotor swept area	3750 m ²
8.	Rotational speed	13.2/19.8
9.	Rotor material	GRP
10.	Regulation	Pitch
11.	Generator	Asynchronous Generator, 4/6 poles
12.	Rated output	250/1250 kW
13.	Rotational speed	1010/1515 rpm
14.	Operating voltage	690 V
15.	Frequency	50 Hz

16.	Protection	IP 56
17.	Insulation class	H
18.	Cooling system	Air cooled
19.	Gear box	3-stage gearbox, 1 planetary & 2 helical
20.	Manufacturer	Winergy
21.	Gear ratio	77.848
22.	Nominal load	1390 kW
23.	Type of cooling	Oil cooling system
24.	Yaw drive system	4 active electrical yaw motors
25.	Yaw bearing	Polyamide slide bearing
26.	Safety system	
26.1.	Aerodynamic brake	3 times independent pitch regulation
26.2	Mechanical brake	Spring power disc brake, hydraulically released, failsafe. Microprocessor controlled, indicating.
27.	Control unit	Actual operating conditions, UPS back-up system
28.	Tower	Tubular
29.	Design standards	GL/IEC

The operation and maintenance (O & M) of the project activity is being done by the Suzlon Global Services Limited. The same has been verified with the O & M Agreement.

The assessment team confirmed through onsite visit with PP representative that there is no proposed or actual change to the project design during this monitoring period. It was observed that the monitoring plan was implemented as per the registered VCS PD and applied methodology AMS-I.D, Version 13. The organisational role and responsibility as mentioned in the registered PD and registered CDM PDD is followed onsite. Calibration of meters were found delayed from the calibration frequency as mentioned in the registered VCS PD and registered CDM PDD. Hence, PP has applied permissible limit (0.2%) of error factor in export and import of electricity for the delayed period (Refer Appendix 5). All the emergency preparedness as mentioned in the registered PD is followed onsite and no discrepancies were found regarding the same.

The project activity is also registered under CDM (UNFCCC Reference Number 2540². PP has claimed VERs from 24/04/2007 to 15/06/2009 under VCS, CERs from 16/06/2009 to 0/06/2010 and from 01/07/2010 to 31/12/2011 under CDM. Verification team confirms that there is no any double accounting for same period was found. The current VCS verification is for period from 01/01/2012 to 23/04/2017. PP will not claim benefits of carbon emission reduction credits achieved through this project activity under any other GHG programme for the crediting period claimed under VCS. Moreover, the project has not generated any other form of environmental credit and a declaration for the same has been submitted to the assessment team and the same is acceptable.

² <https://cdm.unfccc.int/Projects/DB/SGS-UKL1240498237.32/view>

The assessment team observed that the project is implemented in accordance with the registered VCS PD, CDM PDD, final validation report and approved methodology and thus no clarification/deviation is sought.

Assessment team confirms following during the verification site visit:

1. Start date of the project is 29/09/2006, which is the date of commissioning of all WTGs per registered VCS PD and CDM PDD.
2. An undertaking letter dated: 21/04/2021 has been submitted by PP for double counting with any other GHG program. PP also has given a written declaration that project has not claimed other form of GHG credit for the concerned monitoring period.
3. Assessment team confirms that this is overall the 4th monitoring and 2nd monitoring under VCS and covers the activity from 01/01/2012 to 23/04/2017 (inclusive of both dates). Thus, VCS crediting period should be maximum of 10 years (renewables two times). 24/09/2007 is the start date and 23/04/2017 is the end date of the crediting period.

The GHG credits from 01/01/20012 to 23/04/2017 will be claimed under VCS only. At any point of time during the crediting period, the project proponent will abide by the "Double Counting".

4. Assessment team checked and found that the Project proponent of the project activity is as below for the current monitoring period:

Organization name	Deepak Fertilizers and Petrochemical Corporation Ltd.
Contact person	Mr. Suparas Jain
Title	Vice President-Corporate Finance
Address	Sai Hira, Survey No. 93, Mundhwa, Pune, Maharashtra, India
Telephone	+91-20-66458000
Email	suparas.jain@dfpcl.com

5. Assessment team also checked the details of other entity and found that Other entity involved in this project is

Organization name	EKI Energy Services Limited
Contact person	Bibhushita Ghose
Title	Assistant Manager(Operations)
Address	EnKing Embassy, Office No 201, Plot 48, Scheme 78, Part 2, Vijay Nagar, Indore- 452010, Madhya Pradesh, India.

Telephone	0731 428 9086
Email	registry@enkingint.org

6. The quantified emission reduction calculation for the monitoring period is correct and conservative. Assessment team also compared actual VER with the estimated VER and found that the actual VER is 64,883 tCO₂e which is 14.71% lower than the estimated emission reduction 76,074 tCO₂e (14,313 tCO₂e/ 365 days* 1940 days) during this monitoring period which is due to lower wind flow pattern and low PLF attained by the wind power plant during the current monitoring period.

4.2 Safeguards

4.2.1 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 2013³. This report clearly mentioned that solar/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 notification⁴ solar/wind project falls under White Category and are practically non-polluting.

4.2.2 Local Stakeholder Consultation

Local stakeholder consultation has been conducted at the time of project registration. For on-going stakeholder’s communication, PP have maintained feedback/complaint register at the site office. All the stakeholders are happy with the implementation and operation of the project activity and no negative comments envisaged for the project activity. Complaint/suggestion/feedback register is maintained at site as a part of ongoing communication with stakeholders in line with clause 3.16.17 of VCS Standard, ver. 4.1 and appropriate actions taken time to time by PP.

³ <https://smartnet.niua.org/sites/default/files/resources/report-on-developmental-impacts-of-RE.pdf>

⁴ http://envfor.nic.in/sites/default/files/Latest_118_Final_Directions.pdf

Assessment team checked the grievance register provided by PP and found that local stakeholders can anytime lodge their grievances if any in the register over the operational life time of the project. During current monitoring period no grievance was received. Thus, assessment team is of the opinion that the ongoing stakeholder mechanism is adequate and appropriate

4.3 AFOLU-Specific Safeguards

This section is not applicable as this project activity is a non-AFOLU project activity.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

Means verification	of	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 and CDM PDD.								
Findings		CAR 07 and CAR 08 were raised during the verification process and closed successfully. Please refer Appendix 2 of this report for the detail closure of the CAR.								
Conclusion		The baseline Emissions for a given year is calculated by multiplying the energy baseline (EB) with the regional grid emission factor. Formula Used:- Baseline emission: Baseline Emission = Net electricity supplied to grid * Weighted avg. emission factor Ex-ante parameters: As per the registered VCS PD and Registered CDM PDD, the project activity involves grid emission factor as ex-post monitoring parameter, and there is no any parameter considered as ex-ante parameter. Ex-post parameter: As per the registered VCS PD, registered CDM PDD and monitoring plan the following parameters needs to be monitored: <table><tr><td>$EG_{(\text{Net export by project activity})}$</td><td>Net generation from all the WTGs of the promoter at a particular site connected to same feeder.</td></tr><tr><td>$\sum_0^n EG_{n,y}$</td><td>The summation of total Electricity Generated (MWh) at the controller from all the wind turbines of the project proponent at a particular site</td></tr><tr><td>$\sum_0^m EG_{m,y}$</td><td>The summation of total Electricity Generated (MWh) at the controller from all the wind turbines of the project proponent at a particular site</td></tr><tr><td>$EG_{\text{JMR,export}}$</td><td>Total export as measured at the substation feeder of all wind turbines connected to the same</td></tr></table>	$EG_{(\text{Net export by project activity})}$	Net generation from all the WTGs of the promoter at a particular site connected to same feeder.	$\sum_0^n EG_{n,y}$	The summation of total Electricity Generated (MWh) at the controller from all the wind turbines of the project proponent at a particular site	$\sum_0^m EG_{m,y}$	The summation of total Electricity Generated (MWh) at the controller from all the wind turbines of the project proponent at a particular site	$EG_{\text{JMR,export}}$	Total export as measured at the substation feeder of all wind turbines connected to the same
$EG_{(\text{Net export by project activity})}$	Net generation from all the WTGs of the promoter at a particular site connected to same feeder.									
$\sum_0^n EG_{n,y}$	The summation of total Electricity Generated (MWh) at the controller from all the wind turbines of the project proponent at a particular site									
$\sum_0^m EG_{m,y}$	The summation of total Electricity Generated (MWh) at the controller from all the wind turbines of the project proponent at a particular site									
$EG_{\text{JMR,export}}$	Total export as measured at the substation feeder of all wind turbines connected to the same									

		feeder(MWh).
	EG _{JMR,import}	Total import as measured at the substation feeder of all wind turbines connected to the same feeder (MWh).
	Grid Emission Factor	Weighted Average Grid Emission rate (tCO ₂ /MWh)

The generated electricity by project activity is measured through a two-step procedure. The first metering is carried out at the controller of the machine with on-board meter. The monitoring of all these wind turbines is done from a common monitoring station as a part of central monitoring system

The second metering is carried out at grid interconnection point (sub-station) where Joint Meter Reading (JMR) is carried out every month, in presence of PP representatives & official of the state electricity utility. The JMR contains both the “export” and “import” of the electricity to/ from the grid. The net electricity export is calculated as difference of export and import. PP has sourced the export and Import data directly from the JMRs. The net generation from all the WTGs of the promoter at a particular site connected to same feeder is calculated as difference of export and Import which is used for emission reductions calculation.

Net generation from all the WTGs of the promoter at a particular site connected to same feeder (EG_(Net export by project activity)) is calculated parameter and PP has directly used for emission reductions calculation. This parameter is an apportionate value of the difference between total electricity exported to grid by all WTGs connected to a particular feeder relevant to the project activity and the total electricity import from the grid by all WTGs connected to same feeder. Verification team checked the credit reports values for consistency with the considered in emission reduction calculations and the same is cross checked with the invoices which are raised by PP to MSEDCL. The lower of the both values i.e. invoice values and credit report values used for emission reduction calculations. This approach is found conservative and appropriate and this accepted by verification team. Due to delayed calibration of meters(refer Appendix 5 of this report), PP has applied error factor 0.2% for the period of delayed calibration in export and import of electricity. The monitored value of net electricity generation from all WTGs of the promoter is 79,127 MWh.

$\sum_{i=0}^n EG_{n,y}$ **The summation of total Electricity Generated (MWh) at the controller from all the wind turbines of the project proponent at a particular site:** This is measured a measured parameter. This parameter is a summation of electricity generated by all WTGs of the project activity. This parameter is measured online by controller meters installed at each WTG and monitored through a Central Monitoring System (CMS). Daily report of electricity generation by the project activity is being sent to the PP by the O & M agency and being recorded monthly. Electricity generation by all WTGs of the project activity is taken in emission reduction calculation spread sheet and the same is cross checked by verification with the credit reports for the project activity. It is found appropriate and thus accepted. This parameter is being used to apportionate net electricity export and import by all WTGs connected to a particular feeder relevant to

	the project activity. Controller meters installed at individual WTG are microprocessor based thus not possible to calibrate intelligent controllers controlling thus calibration is not possible for controller meters. The monitored value during the current monitoring period is 67,344.06 MWh. $\sum_{n=1}^N EG_{n,y}$ The summation of total Electricity Generated (MWh) at the controller from all the wind turbines of the project proponent at a particular site: This is a measured parameter. This parameter is a summation of electricity generated by all WTGs connected a particular feeder relevant to the project activity including WTGs involved in the project activity. This parameter is being measured online by controller meter installed at each WTGs and monitored through Central Monitoring System (CMS). This parameter is being used to apportionate net electricity export and import by all WTGs connected to substation meters relevant to the project activity. Calibration of meter is not possible for controller meters as mentioned above. The monitored value during the current monitoring period is 636,321.67 MWh. Total export as measured at the substation feeder of all wind turbines connected to the same feeder ($EG_{JMR,export}$): This is a measured parameter. This parameter is total electricity exported to grid by all WTGs connected to a particular feeder relevant to the project activity. The value of total export from the all WTGs connected to same feeder is monitored through tri-vector meter and check meter of accuracy class 0.2s installed at the substation. The monitored value during the current monitoring period is 621,831.95 MWh. Total import as measured at the substation feeder of all wind turbines connected to the same feeder ($EG_{JMR,import}$): This is a measured parameter. This parameter is total electricity imported from the grid by all WTGs connected to a particular feeder relevant to the project activity. The value of total export from the all WTGs connected to same feeder is monitored through tri-vector meter and check meter of accuracy class 0.2s installed at the substation. The monitored value during the current monitoring period is 2,790.25 MWh. Grid Emission Factor: As per VCS PD and Section B.7.1 of the registered CDM PDD, the latest available value of the Weighted Average Grid Emission rate has to be used for the emission reduction calculation. PP has sourced the Weighted Average grid emission factor 0.82 tCO₂/MWh from the CO₂ baseline database version 11 published by the Central Electricity Authority, Govt of India. Verification team confirms that Weighted Average grid emission factor is correct. Further, weighted average grid emission 0.82 tCO₂/MWh is constant throughout this monitoring period as confirmed from the CEA CO₂ Baseline database version 14, thus acceptable to VVB. The verification team has checked the entire monthly JMR reports for the net electricity generated & supplied to the grid and crosschecked the same with the invoices raised by PP to the state Utilities for the monitoring period. All relevant monitoring parameters have been verified with regard to the appropriateness of the applied measurement/determination method, the
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	correctness of the values applied for ER calculation, the accuracy, and applied QA/QC measures. Baseline emission factor is calculated as for following formula: Baseline Emission = Net electricity supplied to grid * Weighted average emission factor BE_y baseline emissions, tCO₂e BE_y = 79,127 MWh x 0.82 tCO₂e/MWh = 64,883 tCO₂e (rundown values) As per applied methodology AMSI.D, Version 13, project emission is considered zero as the project activity involved wind power generation. Leakage: As per applied methodology AMS-I.D, version 13 Leakage emissions are not considered for the project activity. Hence, ER_y= BE_y- PE_y-L_y=64,883 tCO₂e Verification team confirms that the monitoring has been carried out in accordance with the monitoring plan contained in the registered VCS PD and registered CDM PDD.
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4.5 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 09 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 is being carried out by electronic tri-vector bi-directional energy meter of accuracy class 0.2s(main & check) which measured both export and import. The main meter is installed at the state electricity board substation. This electricity meter is being used by state electricity board for JMR (Joint Meter Reading) electricity generation statement. The meters are monitored continuously and cumulative readings are taken at the end of the month by joint meter reading procedures. All the energy meters are under the control of state utility These are sealed by the state Unitalities. The calibration frequency of meters is annually. The Calibration details of meters are provided in Appendix 5 of this report. The meters are calibrated by the meter testing division of the state utility 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 of meters are delayed for few months (Refer Appendix 5 of this report). The calibration results are within permissible limit and therefore, PP has applied error factor 0.2% for the period of delayed calibration in export and import of electricity. Hence, accepted by the assessment team. Calibration details are provided in Appendix 5 of this report. No unforced error observed and feeder wise WTGs location is also checked and found correct. Assessment team confirms that all the energy meters are Elster make and of accuracy class of 0.2s, are calibrated as per the national standards followed by the electricity board.

4.6 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 VERIFICATION CONCLUSION

Applus+ Certification has been engaged by Deepak Fertilizers and Petrochemical Corporation Ltd. to perform the verification of the “10 MW Wind Power Project in Maharashtra by Deepak Fertilizers and Petrochemicals Corporation Limited”.

The Deepak Fertilizers and Petrochemical Corporation Ltd. 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 13.0

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. Further, 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/Power plant verification conducted to arrive at positive verification conclusions. 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.
- A Reasonable Level of assurance was achieved as planned during verification process.

- Verification period: 01/01/2012 to 23/04/2017(inclusive of 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)
2012(01/01/2012to 31/12/2012	12,258	0	0	12,258
2013 (01/01/2013 to 31/12/2013	11,861	0	0	11,861
2014(01/01/2014 to 31/12/2014)	13,234	0	0	13,234
2015(01/01/2015 to 31/12/2015	11,622	0	0	11,622
2016(01/01/2016 to 31/12/2016	13,067	0	0	13,067
2017(01/01/2017 to 23/04/2017	2,841	0	0	2,841
Total	64,883	0	0	64,883

APPENDIX 1: DOCUMENTS REVIEWED OR REFERENCED (VERIFICATION)

No.	Author	Title	References to the document	Provider
1	NA	Commissioning certificates of the WTGs	Commissioning certificates	Project participant
2	NA	Contract of the project participant with the DOE	Contract document signed between PP and DOE	Project participant
3	NA	The operational lifetime of the project activity from the manufacturer = (Technical specefications)	Manufacturer technical specifications	Project participant
4	NA	Registered PD https://registry.verra.org/app/projectDetail/VCS/566	NA	Project participant
5	NA	Calibration Certificates of energy meters	Calibration Certificates	Project participant
6	NA	Emission reduction sheet version 01	ER sheet version 01 dated 20/03/2021	Project participant
7		Emission reduction sheet version 02	ER sheet version 02 dated 08/05/2021	Project Participant
9	NA	MR version 01	20/03/2021	Project participant
10	NA	MR version 02	08/05/2021	Project participant
12	NA	Power Purchase Agreement (PPA)	PPA	Project Participant
13	NA	O & M Agreement	O & M Agreement	Project Participant
15	NA	1st Periodic Verification Report under VCS: Monitoring Peroiod: 24/07/2007 to 15/06/2009	Dated 29/01/2010	Project participant
16	NA	CDM registered PDD, Version 05	Dated 05/06/2009	UNFCCC
17	NA	CDM Verification Report for the monitoring period: 01/07/2010 to 31/12/2011	Version 03, Dated 05/03/2013	UNFCCC
18	NA	Tools/ guidelines used in the project activity - Glossary of CDM terms version 07 - VCS verification report template version 4.0	UNFCCC CDM/VCS web site	UNFCCC
19	NA	Monthly statement- Credit	Monthly statement of	Project

		Reports(JMR)for the complete monitoring period	electricity export and Import	participant
20	NA	Invoices for the complete monitoring period	Invoice	Project participant
21	NA	Declaration regarding no participation in other GHG program for the concerned monitoring period	Declaration dated 21/04/2021	Project participant
22	NA	Break Sown Details	NA	Project participant

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

Project Implementation Status

CL ID	01	Section no.	4.1	Date: 06/04/2021
Description of CAR				
During Desk review, following Discrepancies has been found: 1. Date Format throughout the MR is not in line with the guidelines to complete VCS MR. Corrective action sought. 2. In Section 2.1 of MR, PP has mentioned about a Report issued by MNRE, dated September 2013. However, to verify the same, web-link is missing. Thus, corrective action is sought. 3. Web-link for project's UNFCCC CDM webpage mentioned in Section 1.9 of MR is not working. Correction action sought. 4. Technical specifications of WTGs are missing in MR. PP requested to provide complete technical information of WTGs in MR in line with the VCS PD and also submit the manufactures technical details to assessment team. 5. During the document review it was observed that the feeder wise location of the Wind turbines is missing in the MR. Corrective action is sought in the respective section of the MR. Corrective action is sought.				
Project participant response				Date: 04/05/2021
1. Date format corrected 2. Web link has been provided 3. Correct web link has been mentioned 4. Technical specifications of WTGs are provided in MR. Technical details have been provided. 5. Feeder location has been provided				
Documentation provided by project participant				
Updated MR, Technical Specifications of WTGs				
DOE assessment				Date: 05/05/2021
1. PP has rectified the Date formats throughout the revised MR as per the guidelines to complete VCS MR template v.04. Hence accepted and CAR is closed. 2. Working weblink of report issued by MNRE has been mentioned in section 2.1 of revised MR. Assessment team found respective section is consistent with the report submitted.				

hence CAR is closed.
3. PP has revised weblink for UNFCCC CDM project webpage in section 1.9 of revised MR. Team found it working thus CAR is closed.
4. Technical specification of installed WTG mentioned in section 3.1 of revised MR is found consistent with the technical specification document submitted by PP. Thus, accepted and CAR is closed
5. Feeder wise location of each WTG is mentioned in revised MR. Assessment team also verified same with the JMRs/Credit report of the project activity. Hence CAR is closed.

CAR ID	02	Section no.	4.1	Date: 06/04/2021
Description of CAR				
Break down details of WTGs is missing in MR. PP also requested to submit the supporting evidence of break downs (plant log book for the monitoring period) to assessment team for verification. Corrective action is sought.				
Project participant response				Date: 24/04/2021
Breakdown details are provided in Appendix II of the revised MR.				
Documentation provided by project participant				
Updated MR, Breakdown details				
DOE assessment				Date: 05/05/2021
PP has mentioned major breakdown details of WTGs of project activity in Appendix II of revised MR. Assessment team verified the same with Breakdown sheet and found consistent. Hence CAR is closed.				

CAR ID	03	Section no.	4.1	Date: 06/04/2021
Description of CAR				
MR is not clear about issuances under all mechanisms. Also, all previous issuance documents are not available on VERRA webpage. It is not clear that credits for 16/06/2009 to 31/12/2011 are issued under VCS mechanism. Corrective action requested in the MR for the same.				
Project participant response				Date: 24/04/2021
From 16/06/2009 to 31/12/2011 the project got issued GHG credits in CDM mechanism and same are reflecting into CDM web-page. The UNFCCC webpage link has been provided in MR				
Documentation provided by project participant				
Revised MR				
DOE assessment				Date: 05/05/2021

In section 1.9 of revised MR, PP has provided justification regarding issuance of GHG credit between the period 16/06/2009 to 31/12/2011.

Assessment team found that PP had claimed GHG credit from UNFCCC CDM Programme for this period. Same is verified from UNFCCC webpage link given in the revised MR thus **CAR is closed.**

CAR ID	04	Section no.	4.1	Date: 06/04/2021
Description of CAR				
In Section 4.1 of MR, PP has mentioned Parameter "Grid Emission Factor" as ex-ante. However, in previous CDM monitoring reports, PP mentioned same parameter as Ex-post. Thus, corrective action is sought for the same.				
Project participant response				Date: 24/04/2021
CDM PDD has mentioned 'Grid Emission Factor' parameter as ex post parameter, hence this parameter is mentioned in section 4.2 of VCS MR only.				
Documentation provided by project participant				
Updated MR				
DOE assessment				Date: 05/05/2021
In revised MR, PP has rectified the section 4.1 and mentioned the parameter "Grid Emission Factor" as ex-post" parameter in section 4.2. Assessment found it consistent with registered PDD and previous monitoring reports. Hence CAR is closed.				

CAR ID	05	Section no.	4.1	Date: 06/04/2021
Description of CAR				
During the review of documents submitted by PP, assessment team found that the following documents are missing;				
1. Power Purchase agreement for the project activity 2. Commissioning Certificate of WTGs 3. Declaration regarding avoidance of double counting of emission reductions in the other GHG trading programmes and REC mechanism of India. PP is requested to submit above documents for verification.				
Project participant response				Date: 24/04/2021
1. Power Purchase Agreement has been provided 2. Commissioning Certificate has been provided. 3. Declaration regarding double counting has been provided.				

Documentation provided by project participant	
Power Purchase Agreement, Commissioning Certificate, Declaration regarding Double Counting.	
DOE assessment	Date: 05/05/2021
Following supporting documents has been submitted with revised MR by PP: 1. Power Purchase Agreement between <i>MSEDCL</i> and <i>Deepak fertilizers and petrochemicals corporation limited</i>, dated 06/11/2006. 2. Commissioning certificate of all WTGs, issued by MSEDCL, dated 30/September/2006. 3. Declaration by PP regarding avoidance of double counting of emission reductions in the other GHG trading programmes and REC mechanism of India, dated 21/04/2021. Assessment found all above document consistent with the Revised MR. Thus accepted and CAR is closed.	

Local Stakeholder Consultation

CAR ID	06	Section no.	4.2.2	Date: 06/04/2021
Description of CAR				
PP is requested to provide supporting documents of ongoing communication with local stakeholders as per requirement of Para 3.16.3 and 3.16.4 of the VCS standard V.4.0.				
Project participant response				Date: 24/April/2021
Stakeholder feedback has been provided to the assessment team				
Documentation provided by project participant				
Stakeholder Feedback Document				
DOE assessment				Date: 05/May/2021
As an evidence for the ongoing communication with local stakeholders, PP has submitted Grievance Register to the assessment team. Team found that PP is responsive for each grievance made by local stakeholder. thus accepted, and CAR is closed.				

Accuracy of GHG Emission Reduction and Removal Calculations

CAR ID	07	Section no.	4.4	Date: 06/04/2021
Description of CAR				
1. PP requested to submit supporting evidence of electricity supplied to grid and Invoices for cross check to assessment team. 2. The value for parameter $EG_{(Net\ export\ by\ project\ activity)}$ is reserved till the supporting is submitted 3. The value for parameter $\sum_{i=0}^n EG_{n,y}$ is reserved till the supporting is submitted				

$\sum_{\theta}^m EG_{m,y}$ - The value for the parameter $\sum_{\theta}^m EG_{m,y}$ is reserved till the supporting is submitted - The value for the parameter $EG_{JMR,export}$ is reserved till the supporting is submitted - The value for the parameter $EG_{JMR,import}$ is reserved till the supporting is submitted	
Project participant response	Date: 04/052021
- Documents are provided. - JMR as supporting document has been submitted. - JMR as supporting document has been submitted. - JMR as supporting document has been submitted. - JMR as supporting document has been submitted. - JMR as supporting document has been submitted. Missing JMRs have been submitted.	
Documentation provided by project participant	
JMR	
DOE assessment	Date: 05/05/2021
PP has submitted copies of JMRs and invoices (relevant to the current monitoring period) as an evidence for every monitoring parameter. During review, Assessment team found that all monitoring parameters in revised MR is consistent with the copies of JMRs and invoices. Thus, accepted and CAR is closed.	

CAR ID	08	Section no.	4.4	Date: 06/04/2021
Description of CAR				
Following are the observation in the ER calculation: - The emission reduction calculation value is reserved till the submission of documents - The billing period do not match with the monitoring period. Corrective action is sought along with supporting documents - The estimated emission reduction is not correct. Corrective action is sought for the same.				
Project participant response				Date : 04/05/2021
- Documents are submitted to support ER calculation value. JMRs of missing month have been provided. - Apportioning has been done as billing period does not match with monitoring period - Estimated emission reduction has been calculated as per guidelines.				
Documentation provided by project participant				
Updated ER Sheet and MR				
DOE assessment				Date: 05/05/2021
- Assessment team found calculation of emission reduction is consistent with the copies of JMRs and invoices submitted. thus, ER value is accepted and CAR is closed. - PP has done apportioning for the last monitoring month for each unit. Assessment team				

- verified same with the DGR sheet submitted by PP, thus **CAR is closed**.
3. Estimation of emission reduction for the current monitoring period has been revised by PP and assessment team found it correct. Thus, **CAR is closed**.

Quality of Evidence to Determine GHG Emission Reductions and Removals

CAR ID	09	Section no.	4.5	Date: 06/04/2021
Description of CAR				
The details information of monitoring equipment's such as serial number of meters, make, calibration date dates, due date of calibration are not provided in MR. Further, Calibration certificates are also not submitted to the assessment team. Corrective action is sought for the same.				
Project participant response				Date: 04/05/2021
Meter details and calibration details are provided in MR and evidence has been submitted to the assessment team. Missing Calibration Certificates and meter change report have been provided.				
Documentation provided by project participant				
Updated MR and Calibration Certificates				
DOE assessment				Date: 05/05/2021
PP has mentioned details of monitoring meters and its calibration in appendix I of revised MR. Also, to verify the same, copies of calibration certificates and meter change certificates has been submitted to assessment team. Team found evidence document consistent with the respective section of revised MR. thus accepted and CAR is 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	Das	Sukanta	TQC-Outsourced entity	Yes	Yes	Yes	Yes
2.	Auditor	OR	Singh	Jitendra Mohan	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	Shen	Simon	Applus+ Certification
2.	Approver	IR	Calle de Miguel	Agustín	Applus+ Certification

Short CVs of the Team:

1. Mr. Sukanta DAS, has done M. Sc. in (Electronics and Photonics) and M. Tech in (Energy technology) from Tezpur Central University/ Indian Institute of technology Bombay in India. He is a certified lead auditor for ISO 14001 EMS LA and ISO 9001 QMS LA from International registry for Certified Auditors (IRCA) and Certified Lean Management practitioner from Quality Council of India (QCI). He has more than Nine (9) years of working experience at TUV NoRD/ Re-consult/CRA/APPLUS certifications under various categories of projects stating from Renewable to waste to supercritical projects. He was JI/ CDM Lead Assessor in TUV NoRD and was involved in more than 100 CDM validation and verifications activities in Gold Standard, VCS, CDM projects as a team leader/technical reviewer / validator / verifier

covering the sectoral scope 1, 13 technical areas 1.2/1.1/13.1. Currently he is associated with True Quality Certifications Private Limited and is empanelled with APPLUS certification to carry out GHG audit.

2. Mr. Jitendra Mohan Singh, has done Advanced MSc in Sustainable Energy Systems and Management from International Institute of Management, University of Flensburg, Germany and B.Tech. in Agricultural Engineering from Allahabad University, India. He has more than (18) years of working experience in different organizations like IARI, IIT Delhi, ICAR, IRADe, CAPART, SMEC and Perenia Carbon and M B Power (Madhya Pradesh) Ltd. in the area of Agriculture, Energy & Environment and Climate Change. He also worked on contract basis (ad hoc) as a RIT expert in UNFCCC from 2010 to 2013. Currently, he is associated with True Quality Certifications Private Limited and is empanelled with APPLUS certification to carry out validation and verification related to GHG reductions projects
3. Mr. Simon Shen (Master's Degree in Thermal Energy Engineering, Bachelor's Degree in Environmental Engineering) is an Auditor appointed by Applus+ LGAI for the GHG project assessment, auditing and technical review. He has more than 6 years of work experience in CDM/GS4GG/VCS project assessment and review with Applus+, apart from the years of experience working as GHG Auditor and ISO 9001/14001 in TUV SUD for 3.5 years before he joined Applus+. Mr. Simon Shen has extensive experience also as former Applus+ Shanghai CDM Technical Manager.

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
RBI	Reserve Bank Of India
PP	Project Participant

APPENDIX 5: CALIBRATION DETAILS OF THE METERS

Meters are Elster make with 0.2s accuracy. Calibration details of the WTGs installed in the project activity is provided below:

WTG ID	Feeder	Meter No	Meter Type	Calibration Date	Remarks	Error factor (0.2%) applied for delayed calibration*
K 441	Nandurbar I	4860906	Main Meter	17/09/2011 05/10/2012, 30/07/2013, 17/06/2014, 01/08/2015, 14/03/2017	No change in Main Meter	09/2012 to 10/2012, 06/2015, 07/2015, 08/2016 to 03/2017
		4890574	Check Meter	05/10/2012		
K 442		4890622	Check Meter	17/06/2014, 01/08/2015, 14/03/2017		
K 503	Nandurbar II	4860905	Main Meter	17/09/2011 05/10/2012, 30/07/2013, 17/06/2014, 01/08/2015	Old meter Sr. No. 4860905 changed with New calibrated meter	09/2012 to 10/2012, 06/2015, 07/2015
		2814593	Main Meter	14/03/2017	Sr.No.2814593 on 28/06/2016	
		4890568	Check Meter	05/10/2012, 30/07/2013, 17/06/2014, 01/08/2015	Old Check Meter Sr. No. 4890568 with new calibrated	
		2814594	Check Meter	14/03/2017	Check Meter Sr. No. 2814594 on 28/06/2016	
K 478	Gangapur 07	4961766	Main Meter	17/09/2011 04/10/2012, 06/08/2013, 17/06/2014	Old Main Meter Sr. No. 4961766 changed with new calibrated Main meter Sr. No. 2793535 on 30/03/2015	09/2012 to 10/2012, 06/2015
		2793535	Main Meter	25/06/2015, 11/06/2016,		
		4890563	Check Meter	04/10/2012		
		4890561	Check Meter	17/06/2014,		
		2798608	Check Meter	25/06/2015, 11/06/2016		

J 087	Jamde 05	4725781	Main Meter	17/09/2011 25/09/2012, 29/09/2013, 05/06/2014, 03/07/2015, 09/03/2017	No Change	09/2012, 09/2013, 06/2015 07/2015, 07/2016 03/2017	to to
J 091		4725782	Check Meter	17/09/2011 25/09/2012, 29/09/2013, 05/06/014, 03/07/2015, 09/03/2017			
K 513	Ranala Rural	4725815	Main Meter	20/09/2011	Old Mail Meter Sr. No. 4725815 changed with New calibrated main Meter Sr. No. 14796474 on 28/07/2012	09/2012 06/2014, 06/2015 07/2015, 08/2016 03/2017	to to to
K 514		14796474	Main Meter	04/06/2014, 01/08/2015, 14/03/2017			
		4725810	Check Meter	20/09/2011			
		14796473	Check Meter	04/06/2014, 01/08/2015, 14/03/2017			

*The calibration frequency is annual. There is delay in calibration of meters as mentioned in table and delayed calibration result is within permissible limit. Hence maximum permissible error factor of 0.2% is applied for delayed calibration period.