PRE- CMD VERIFICATION OF "WIND POWER PROJECT AT JAIBHIM BY SIIL"

EPIC Sustainability Services Private Limited

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Prepared By	EPIC Sustainability
Contact	EPIC Sustainability Services Pvt. Ltd. No. 41, Anugraha, 1st Cross Road, Sundarnagar, Near BEL Circle, Gokula Extension, Bengaluru - 560 054, Karnataka State, India. Email: info@epicsustainability.com, epicsustainability@gmail.com Phone: +91 94827 59072, +91 95909 29935 Website: http://www.epicsustainability.com/
Approved By	Mr. K. Sudheendra (Head-Operations)
Work Carried Out By	Mr. A. Prabu Das (Team Leader)

	Dr. R. Madhukar (Technical Reviewer)

Summary:

Serum Institute of India (SIIL) has appointed EPIC Sustainability Services Private Limited to perform the verification of the emission reductions reported for the CDM project titled "Wind power project at Jaibhim by SIIL" UNFCC No. 6456, for the period from 11-March-2011 to 31-December-2012. The verification was based on the validated project description (PD) version 3.0 dated 10-June-2016, Validated CDM PDD version 09 dated 31-Dec-2012, corresponding validation report and other supporting documents made available to the verification team by the client.

The project activity is a Grid connected wind power project implemented in Maharashtra, India. The total capacity of the bundled project activity is 33.6 MW which consist of 16 WTGs each of 2.1 MW capacity in Jaibhim village of Dhule district in Maharashtra. The project is promoted by "Serum Institute of India (SIIL)" which is the representative of this Project. The purpose of the project activity is to generate clean electricity with utilization of wind energy.

The verification team identified, through the verification process, One CAR and one CR. No FAR is raised in this verification. The client has taken actions and submitted to EPIC the revised monitoring report and supporting evidence. The verification team, through the verification process, confirmed that the emission reductions achieved by the project activity during the monitoring period are correctly calculated in the monitoring report, Version 3, dated 10-June-2016. Therefore, EPIC certifies the emission reductions amounting to **110,347** tCO_2e for the period 11-March-2011 to 31-December-2012 (both days inclusive).

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1 INTRODUCTION

1.1 Objective

EPIC Sustainability Services Private Limited (EPIC) has been contracted by Serum Institute of India (SIIL) to undertake the independent verification of the CDM project activity titled "Wind power project at Jaibhim by SIIL" UNFCC No. 6456 in Maharashtra by SIIL. The following are the objectives of this verification:

- To verify that the actual monitoring system and procedures are in full compliance with the system and procedures described in the monitoring plan of validated PD, version 3.0 dated 10-June-2016/1/, CDM PDD Ver 09 dated 31-oct 2012/1/ as well as with the applicable methodology;

- To verify the monitoring report with deviations are in compliance with monitoring plan and VCS rules

- To verify that the data reported were accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emissions reduction calculation; and

- To verify and certify GHG emission reduction reported for the project for the period from 11-March-2011 to 31-December-2012.

1.2 Scope and Criteria

The scope of the verification was the independent and objective review and ex-post determination of the monitored reductions in GHG emissions from ""Wind power project at Jaibhim by SIIL". The verification of this project was based on the validated and registered project document (PD) and CDM PDD/1/, CDM validation report and supporting documents made available to the verification team. These documents were reviewed against the requirements of the VCS standard version 3.4, VCS guidelines, the CDM Modalities and Procedures, related rules and guidance, and the Validation and Verification standard/4/ Version 9.0. The verification is not meant to provide any consulting towards the client. However, stated request for clarifications and/or corrective actions may provide input for improvement of the project design.

1.3 Level of Assurance

In line with VCS requirements and as per ISO 14064-3:2006 para A.2.3.2, a reasonable level of assurance is defined for the verification of the project.

The verification report is based on the Project Description/1/, monitoring report/2/, emission reduction/3/ calculation sheet and other supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment. The verification opinion is assured through the credibility of all documents checked.

This implies that based on the process and procedures conducted EPIC should state whether the information in the PD[/1/] is materially correct and is a fair representation of the of the actual project details, and is prepared in accordance with the VCS requirements and the applied CDM methodology for information pertaining to additionality, GHG quantification, monitoring and reporting.

1.4 Summary Description of the Project

The project activity is a Grid connected wind power project implemented in Maharashtra, India. The total capacity of the bundled project activity is 33.6 MW which consist of 16 WTGs in Jaibhim village, Dhule district of Maharashtra. The project is promoted by *Serum Institute of India (SIIL)* which is the representative of this bundled project. The purpose of the project activity is to generate clean electricity with utilization of wind energy. The details of the bundled project are given below:

PPs	*Serum Institute of India (SIIL)*
Location	Dhule District
Capacity of each WTG	2.1 MW
WTG Make	Suzlon
Model Number	S88
Total Number of WTGs	16
Total Capacity	33.6 MW
Commissioning Date	11-03-2011 (Earliest Commissioned WTG)

All the WTGs are commissioned on 11-March-2011 and the same is verified through commissioning certificates[/5/]. The project activity is to harness the renewable resources of wind power and thereby displace equivalent electricity from the fossil fuel dominated NEWNE grid. The exact geographical locations of the WTGs mentioned in the MR have been checked during the site visit.

2 VERIFICATION PROCESS

2.1 Method and Criteria

The verification process consists of the following phases:

i) a document review of the project design documents, monitoring reports and preparation of verification protocol;

ii) on-site visit to the project activity and interviews with project developer and project consultant; and
iii) resolution of outstanding issues and the issuance of final verification report and opinion.

In order to ensure transparency, a verification protocol was prepared for the project according to the VVS[/4/] version 9.0 verification requirements and VCS Standard version 3.4. The verification protocol serves the following purposes:

- it organizes, details and clarifies the requirements that a VCS project is expected to meet;
- it ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The completed verification protocol is enclosed in Appendix of this report.

During the verification, non-ful-fillment of the verification protocol criteria or identified risks to the fulfilment of project objectives were raised as either CAR or CR. Corrective Action Requests (CAR) were issued, where:

i) mistakes had been made that directly impacted on the project results; or
ii) VCS requirements had not been met; or
iii) there was a risk that the project would not be accepted as a VCS project or that emission reductions will not be certified.

The Clarification Requests (CR) were issued where additional information was needed to clarify issues, and Forward Action Requests (FAR) for issues relating to project implementation that required review during the first verification of the project activity.

The following team members from EPIC were involved in verification process:

Name	Role	Technical area	Components reviewed
Mr. A. Prabu Das	Lead Auditor	Qualified for TA 1.2 Renewables under sectoral scope 01	Completeness check, desk review, onsite inspection, Interview with project representatives, issuance of findings, report preparation.
Dr. R. Madhukar	Technical Reviewer	Qualified for TA 1.2 Renewables under sectoral scope 01	Checking and verifying of information related to draft final report.

2.2 Document Review

The verification was performed primarily based on the review of the monitoring report[/2/] and the supporting documentation. This process included:-

1. a review of data and information presented to verify their completeness
2. a review of the Monitoring Plan and monitoring methodology, paying particular attention to the

frequency of measurements, the quality of metering equipment including calibration requirements, and the QA/QC procedures, and

3. an evaluation of data management and the QA/QC system in the context of their influence on the generation and reporting of ERs.

The monitoring report[/2/], Version 01, dated 28/02/2016 was initially reviewed and further EPIC requested the PP to present the supporting evidences. Additional background information and documents related to the project performance were also reviewed by EPIC. Through the process of the verification, the revised monitoring report and the supporting documents were evaluated to confirm the actions taken by the PP to the CARs and CRs issued by EPIC. The documents reviewed by EPIC are listed in References section of this report. EPIC reviewed the final version of the monitoring report[/2/] Version 3.0 dated 10/06/2016 to confirm that all changes agreed had been incorporated.

2.3 Interviews

After the review of the Project description and documents a site visit was carried out from 01-02 March 2016. During the site visit physical inspection of the project components followed by interviews with the on-site personnel was carried out to verify the project details. A follow-up meeting was also conducted with the project representatives. The following persons were interviewed.

Name & Designation	Company	Details of Interview
Mr. Chetan Wagh	Serum Institute of India Limited	Project Design, Technical Details, Monitoring procedure, Incidents during the monitoring period.
Mr. Prashant Desde	Suzlon	Monitoring points, Procedure for calculation of net meter, JMR generation
Mr Sumeet Singhvi,	Infinite Solutions	Overall project implementation and CER estimation calculations

2.4 Site Inspections

An onsite visit was conducted for all the WTGs located in Mharashtra, India. During the site visit, the actual on-site practices adopted and followed for the operation of the project were compared with the description given in the monitoring report[/2/]. The grid-connectivity, metering practices, calibration[/7/] and level of accuracy were examined. The archived data of the energy generated was also reviewed.

An on-site assessment was conducted as a part of verification activity and involved:
1) An assessment of the implementation and operation of the VCS project activity as per the registered PD
2) A review of information flows for generating, aggregating and reporting of the monitoring parameters
3) Interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the Monitoring Plan
4) A cross-check between information provided in the MR and data from other sources
5) A check of the monitoring equipment including calibration[/7/] performance, and observations of monitoring practices against the requirements of the PD and the applied methodology
6) A review of calculations and assumptions made in determining the GHG data and ERs, and
7) An identification of QA/QC procedures in place to prevent, or identify and correct, any errors or omissions in the reported monitoring parameters.

2.5 Resolution of Findings

Resolution of Clarification and Corrective Action Requests

The objective of this phase of the verification was to resolve the corrective action requests and clarifications and any other outstanding issues which needed to be clarified prior to EPIC positive conclusion on the monitoring report and the project design. During the verification process One CARs and One CR were raised.

All the CARs and CRs were resolved during this phase. In order to ensure the transparency of the validation process, the concerns raised and responses that were given are summarized in Appendix 1 of this report and documented in more detail in the Verification in Appendix 1. All the corrective actions have been incorporated into the monitoring report.

Internal quality control

A Technical Reviewer is appointed to review the final draft verification report and the final verification report. The comments made by the Technical Reviewer are taken into consideration and incorporated in the final report. The final report (after resolutions of all findings) is then submitted to the Head – Operations for review and approval.

2.5.1 Forward Action Requests

There are no FAR raised during this verification process.

2.6 Eligibility for Validation Activities

EPIC has been accredited for validation and verification for the scopes 1-11 and 13-15 by CDM UNFCCC and as well as by the VCS board.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project proponent is undertaking the same project activity under CDM however VCU's shall be claimed only till the day before the start date of crediting period under CDM, i.e. 1/01/2013. The Project Proponent confirms that the Project is also registered under CDM[1] on 28/11/2012 and they will claim emissions reductions from the Project only in one mechanism for a particular period to avoid double counting. The verification team also checked the national as well as international credits trading systems to assess double counting risks and the web links for the same have been listed in the appendix of this report.

3.2 Methodology Deviations

There is no methodology deviation involved.

3.3 Project Description Deviations

The project was initially conceptualized for captive consumption of electricity generated from the project activity. However, during the operational phase, due to change in government policies, the project used the electricity for captive purpose while at times it had to sell the electricity either to third party or the grid.

In the future as well, as the project proponent would either use the electricity for captive purpose or it may sell the electricity either to third party, power exchange or to the grid, based on the regulatory policy applicable at that time, additionality analysis (IRR and tariff rate) was provided for all possible options in the PD which was validated. This deviation does not impact additionality as indicated in the PD. The verification team is of the opinion that the most conservative option was chosen to demonstrate adiitonality and future changes in the mode of sale of electricity would not have impact on additionality. The verification team has raised CR 01 during both the gap validation and verification with reference to the project deviation which was resolved by updation of the PD.

[1] https://cdm.unfccc.int/Projects/DB/LRQA%20Ltd1340102581.62/view

3.4 Grouped Project

The project activity is not a grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The verification based on the onsite observation, found that there is no material discrepancies between the project implementation and the project description. The verification team checked the status of monitoring plan, the completeness of monitoring system and found no discrepancies between the actual monitoring system and the monitoring plan set in the validated project description. The verification team also confirmed that the project has been under operation since commissioning. The verification team was able to conclude the project has been implemented as described in the validated project description.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

The verification of all the data ex-ante and data ex-post (monitoring parameters) used for the calculation of baseline emissions, project emissions and leakage emissions are tabulated below.

<table>
<tr><th>Parameter</th><th>Conclusion by the verification team</th></tr>
<tr><td>Baseline emission factor ($EFgrid_{,y}$) = 0.9487 tCO_2/MWh (Ex-ante)

Source: Validated PD and Corresponding Validation report, Validated CDM PDD and Corresponding Validation report</td><td>The verification team has checked the value and found that the value is fixed ex-ante for the entire crediting period and the value is considered for this monitoring period also which is sourced from the validated PD and accepted by the verification team. The value is used consistently across the monitoring report/2/, VER sheet. Hence accepted by the verification team.</td></tr>
<tr><td>Electricity supplied by the project activity to the Grid (EGy)

<table><tr><td>Electricity supplied (EGy)</td><td>Value in tCO2e</td></tr><tr><td>EGy 2011</td><td>48,823.28</td></tr><tr><td>EGy 2012</td><td>67,492.06</td></tr></table></td><td>The verification team based on the on-site visit confirmed that net electricity supplied to the grid by each WTG is measured through the meter readings of the energy meters installed by electricity board, which are bi-directional and have facility to record export and import of energy.
The team has checked the electronic archiving of all the monitored data. Calibration/7/ of all the energy meters will be undertaken at least annualy. The accuracy class of the energy meters is 0.2s. The verification team has found that no WTG is due for calibration/7/ during this monitoring period and meters were working with the intended accuracy. The monitoring frequency for EGy matches with that of the applied methodology, viz. hourly measurement and monthly recording. The cross</td></tr>
</table>

<table>
<tr><td></td><td>checking is provided through the use of the invoices[8] receipts. Project participant has included a few other variables in the monitoring plan to account for the uncertainty where the dates of the recorded data may not coincide with the verification period.
The verification team cross checked the JMR and breakup sheets for all WTGs to confirm the apportioning procedure followed by as per the registered PD and monitoring report submitted for verification. The same has been confirmed during site vist and interview with the O&M and SEB officials. Further power purchase agreements for the entire monitoring period were reviewed for its conformance with project design.</td></tr>
<tr><td>Baseline emission (BE y)
<table><tr><td>Baseline emission (BEy)</td><td>Value in tCO2e</td></tr><tr><td>BE_{y2011}</td><td>46,318</td></tr><tr><td>BE_{y2012}</td><td>64,029</td></tr></table></td><td>As per the validated PD, BEy is calculated as follows.
$BE_y = EG_{PJ,y} X EF_{grid,CM,y}$ which is accepted by the verification team.</td></tr>
<tr><td>Project emission (PEy) = 0</td><td>The electricity generation from the renewable energy source i.e. wind & solar energy. Hence there is no project emission from the project activity which is accepted by the verification team.</td></tr>
<tr><td>Leakage (LEy) = 0</td><td>As per the validated PD[1], there is no leakage identified for this project activity.</td></tr>
<tr><td>Emission reductions[3] (ERy)
<table><tr><td>Emission reductions (ERy)</td><td>Value in tCO2e</td></tr><tr><td>ER_{y2011}</td><td>46,318</td></tr><tr><td>ER_{y2012}</td><td>64,029</td></tr></table></td><td>As per the validated PD[1], the emission reduction[3] is calculated as follows.
$ER_y = BE_y - PE_y$</td></tr>
</table>

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

The emission reductions[/3/] are calculated on the basis of the JMR[/9/] readings and break-up sheets [/10/] at the project location. The electrical meters are locked and sealed and thus are tamper free. Two feeders of 22.5 MW each are dedicated for Suzlon -16 WTGs (10 nos on one feeder and 6 on the other) at the Sakri switchyard (33/132 KV) .The WTGs are connected through a 33 KV overhead line up to Sakri Switchyard. At the MSEDCL sub-station, the total export & import to these feeders is monitored using main & the check meters, which are electronic tri-vector meters. The total export at this meter is arrived at by multiplying the monthly meter reading to the multiplying factor of the meter concerned. The monthly meter reading is arrived at as the difference between the current meter reading and the previous meter reading. The period between these two readings is usually a period of 30 days which may vary. In a similar fashion, total import at this meter is also calculated.

The accuracy class of the energy meters is 0.2s and the calibration frequency is annual. The details of the energy meters as verified are indicated in Appendix 2. As already mentioned in section 4.2, the readings of the JMR[/9/] are taken jointly. The readings of the JMR and break-up sheets[/10/] are cross checked with the invoices[/8/] issued by respective project participant to state electricity board. Other than this, several documents were submitted by the project participant as evidence to determine emission reductions and to cross check the values. These values were cross checked and the verification team is satisfied with the quality of the evidence used to determine emission reductions.

Apart from the JMR[/9/], daily generation is recorded and is reported to the local office of the O&M service provider. All the copies of such daily generation, comparison with previous year's generation, preventive maintenance schedule, breakdown records etc. are stored at the office of the O&M service provider at the site. A set of all the monitoring data is also sent to the head office of the PP. The data right from the commissioning of the WTG and solar power plant were found to be archived.

The site representative of the PP ensures that the monitoring of the site is done on a continuous basis by the O&M service provider. The representative is also informed within a day in case of any break down at the site. The representative was found to cross check the daily generation data.

4.4 Non-Permanence Risk Analysis

Not applicable for a renewable energy project.

5 VERIFICATION CONCLUSION

EPIC Sustainability Services Private Limited has been engaged by Serum Institute of India (SIIL) to perform the Pre- CDM verification of the CDM project "Wind power project at Jaibhim by SIIL" UNFCC No. 6456, for the period from 11-March-2011 to 31-December-2012.

The verification was based on the validated project description (PD) version 3.0 dated 10-June-2016, Validated CDM PDD version 09 dated 31-Dec-2012, corresponding validation report and other supporting documents made available to the verification team by the client.

In addition, the baseline and monitoring methodology (ACM 002 Version 12.3.0), the Monitoring Report/2/, emission reduction/3/ spread sheets and other supporting documents made available to EPIC verification team by the project participant. The management of SIIL and infinite solutions were responsible for the preparation and reporting of GHG emissions data and the reported GHG emissions reduction on the basis set out within the project monitoring plan.

It is the responsibility of EPIC verification team to express an independent GHG verification opinion on the GHG emissions from the project for the monitoring period starting from 11-March-2011 to 31-December-2012. and on the calculation of GHG emission reductions from the project based on the verified emissions for the same period.

The verification was carried out in accordance with the requirements of the Validation and Verification standard Version 9.0 and VCS Standard 3.4. As a result of the verification, the verification team confirms that for the reporting period:

- all operations of the project were implemented as described in the registered CDM PDD/1/, (project ID 6456)
- the monitoring plan is in accordance with the approved monitoring methodology, ACM0002 version 12.3 applied by the project activity.
- the monitoring has been carried out in accordance with the validated PD/1/ version 3.0 dated 10th June 2016.
- the monitoring aspects (i.e. additional monitoring parameters, monitoring frequency and calibration frequency) were in place and functional, with the installed equipment essential for generating emission reduction operating appropriately and the calibration of all the equipment had been carried out accordingly and appropriate adjustments had been made, and
- the GHG emission reductions achieved were calculated correctly on the basis of approved monitoring methodology ACM002 version 12.3.

EPIC has verified that the information included in the final monitoring report/2/ (version 3.0, dated 10th June 2016) was correct and that the emission reductions achieved had been determined correctly. In our opinion, the GHG emission reductions for the period from 11-March-2011 to 31-December-2012 stated in the latest revised monitoring report (version 3.0, dated 10th June 2016) for the project are fairly stated.

EPIC confirms that the GHG emission reductions were calculated without material misstatements for the whole monitoring period. Our opinion is based on the projects GHG emissions and resulting GHG emission reductions reported, and, to the valid and registered project baseline and monitoring documents.

Verification period: From [11-March-2011] to [31-December-2012]

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

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
Year 2011	46,318	0	0	46,318
Year 2012	64,029	0	0	64,029
Total	**110,347**			**110,347**

Prepared by	Approved by :
	
Mr. A. Prabu Das	Mr. K. Sudheendra
(Lead Auditor)	(Head Operations)

6 REFERENCES

/1/	VCS Project Description, Version 03, dated 06th June 2016 and CDM PDD version 09 dated 31st October 2012.
/2/	Monitoring report ver 03 dated 06th June 2016
/3/	Emission Reduction calculation sheets dated 14th April 2016
/4/	Validation and Verification Standard, Version 09
/5/	Commissioning Certificates of all WTGs.
/6/	Power Purchase Agreement for all WTGs.
/7/	Calibration testing certificates for all WTGs
/8/	Invoices for energy generated raised by PP to SEB
/9/	Joint Meter Reading reports (JMR) for all WTGs
/10/	Break Up Sheets for all WEGs in Maharashtra

APPENDIX 1:

Web links refers to the information verified by the VVB to ascertain that the project or individual project participants have not participated in the any of the other national and international carbon trading systems.

1. https://mer.markit.com/br- reg/public/index
2. http://cdm.unfccc.int/Projects/projsearch.html
3. https://www.recregistryindia.nic.in/index.php/general/publics/accredited_regens
4. https://www.recregistryindia.nic.in/index.php/general/publics/accredited_regens
5. https://www.recregistryindia.nic.in/index.php/general/publics/accredited_regens
6. https://www.recregistryindia.nic.in/index.php/general/publics/accredited_regens

APPENDIX 2

Energy meter details

Feeder	Machine ID	Capacity in MW	Calibration Main meter	Calibration Check meter	Accuracy	Make	Sl. No.	Remarks
01	JAI-02, JAI-03, JAI-04, JAI-05, JAI-07, JAI-08	2.1 MW X 6	01 - 20/8/2010 02- 17/9/2011 03- 26/07/2012	01 - 20/8/2010 02- 17/9/2011	0.2s	Elster	Main meter 04890617 14796437 Check meter 04890556	Main meter replaced. For period in which calibration frequency is lapsed, the error factor is applied accordingly (Refer ER sheets)
02	JAI-09, JAI-11, JAI-18, JAI-19, JAI-21, JAI-22, JAI-23, JAI-27, JAI-28, JAI-29	2.1 MW X 10	01 - 20/8/2010 02- 17/9/2011 03- 26/07/2012	01 - 20/8/2010 02- 17/9/2011	0.2s	Elster	Main meter 04890618 14796436 Check meter 04890561	Main meter replaced. For period in which calibration frequency is lapsed, the error factor is applied accordingly (Refer ER sheets)

RESOLUTION OF CAR/CRS

Correction Action Request (CAR) or Clarification Request (CR) or Forward Action Request (FAR)	Reference to Table 1 & 2	Response from project participant	Validation team conclusion
CR 01 While this section indicates various options avaialbe to PP for sale of electricity, the additionality analysis has not been provided to justify the same.	Section 2.2.2	The analysis of the options have been included under additionality section in the VCS PD version 03	The revised PD indicated the various options for sale of electricity and impact on IRR from which it was further verified that the most conservative option was used to establish additionality.
CAR 01 Calibration certificates for all energy meters (feeder 1 and feeder 2) is not provided.	Section 3.2	The MR version 03 is updated now to include calibration details	The revised MR includes the calibration details of all meters for al feeders which is sufficient as per requirements.