

# 44.40 MW WIND ENERGY PROJECT BY RUCHI SOYA INDUSTRIES LIMITED, INDIA



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|                      |                                                                      |
|----------------------|----------------------------------------------------------------------|
| <b>Project Title</b> | 44.40 MW Wind Energy Project by Ruchi Soya Industries Limited, India |
| <b>Version</b>       | 1.0                                                                  |
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|                            |                                                                                                                                                                                                                                                                |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Report Title</b>        | 44.40 MW Wind Energy Project by Ruchi Soya Industries Limited, India                                                                                                                                                                                           |
| <b>Client</b>              | Ruchi Soya Industries Limited                                                                                                                                                                                                                                  |
| <b>Pages</b>               | 35                                                                                                                                                                                                                                                             |
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## Summary:

Ruchi Soya Industries Limited has commissioned the TÜV NORD JI / CDM Certification Program to carry out the verification of the Project “**44.40 MW Wind Energy Project by Ruchi Soya Industries Limited, India**” with regard to the requirements of VCS Version 3 Standard.

The project is a renewable energy project. It has been implemented to produce electricity by using wind, a renewable source of energy. The project activity involves installation of the Wind Turbine Generators (WTGs) in different locations of Madhya Pradesh and Rajasthan with a total installed capacity of 44.40 MW with 44 number of WTGs with rated capacity of 600 kW each (model S-52) and 12 WTGs with rated capacity of 1500 kW each (model S-82).

### Reporting period: 26/02/2010 to 12/12/2012 (Including both days)

In the course of the verification 06 Corrective Action Requests (CARs) and one Clarification Requests (CLs) are raised. No Forward Action Request (FAR) is raised in this verification.

The verification is based on the monitoring report<sup>/MR/</sup>; the monitoring plan as set out in the validated VCS PD<sup>/VCS-PD/</sup>, the validation report<sup>/VAL/</sup>, emission reduction calculation spreadsheet<sup>/XLS/</sup>; VCS Project Document<sup>/VCS-PD/</sup> and other supporting documents like commissioning certificate<sup>/CC/</sup> breakdown records<sup>/BD/DGR/</sup>, Calibration certificate<sup>/CAL/</sup>, Invoices<sup>/INV/</sup> etc. made available to the TÜV NORD JI/CDM CP by the project participant.

As the result of the VCS verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions of in the above mentioned reporting period (**From 26/02/2010 to 12/12/2012**) as follows:

Total Emission reductions      **153,155 tCO<sub>2</sub> equivalents**

## ABBREVIATIONS

|                        |                                                       |
|------------------------|-------------------------------------------------------|
| <b>BAU</b>             | Business as usual                                     |
| <b>CA</b>              | Corrective Action / Clarification Action              |
| <b>CAR</b>             | Corrective Action Request                             |
| <b>CDM</b>             | Clean Development Mechanism                           |
| <b>CO<sub>2</sub></b>  | Carbon dioxide                                        |
| <b>CO<sub>2e</sub></b> | Carbon dioxide equivalent                             |
| <b>CP</b>              | Certification Program                                 |
| <b>CL</b>              | Clarification Request                                 |
| <b>DNA</b>             | Designated National Authority                         |
| <b>EB</b>              | CDM Executive Board                                   |
| <b>ER</b>              | Emission Reduction                                    |
| <b>FAR</b>             | Forward Action Request                                |
| <b>GHG</b>             | Greenhouse gas(es)                                    |
| <b>GWP</b>             | Global Warming Potential                              |
| <b>IPCC</b>            | Intergovernmental Panel on Climate Change             |
| <b>MP</b>              | Monitoring Plan                                       |
| <b>MR</b>              | Monitoring Report                                     |
| <b>QC/QA</b>           | Quality control/Quality assurance                     |
| <b>RERC</b>            | Rajasthan Electricity Regulatory Commission           |
| <b>UNFCCC</b>          | United Nations Framework Convention on Climate Change |
| <b>VCS</b>             | Voluntary Carbon Standard                             |
| <b>VCS – PD</b>        | VCS - Project Description                             |
| <b>VCU</b>             | Voluntary Carbon Unit                                 |
| <b>VVM</b>             | Validation and Verification Manual                    |
| <b>WTG</b>             | Wind Turbine Generator                                |

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## 1 INTRODUCTION

Ruchi Soya Industries Limited has commissioned the TÜV NORD JI/CDM Certification Program to carry out the verification of the project:

**“44.40 MW Wind Energy Project by Ruchi Soya Industries Limited, India”**

with regard to the relevant requirements of the Voluntary Carbon Standard version 3<sup>/VCS/</sup>. The verifiers have reviewed the implementation of the monitoring plan (MP) in the validated VCS project for the monitoring period 26/02/2010 to 12/12/2012 (both days included),

The applied methodology is “Consolidated baseline methodology for grid-connected electricity generation from renewable source”, ACM0002 version 12.1.0.

### 1.1 Objective

The purpose of this verification, by independent checking of objective evidence, is as follows:

- to verify that the project is implemented as described in the project design document;
- to assess the implementation of the monitoring plan (MP) content in the registered VCS PD;
- to assess the project's compliance with other relevant rules, including the host country (India) legislation;
- to confirm that the monitoring system is implemented and fully functional to generate voluntary emission reductions (VERs / VCUs) without any double counting; and
- to establish that the data reported are accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emissions reduction calculation
- to assess conformity of monitoring plan of the project with applied methodology, Consolidated baseline methodology for grid-connected electricity generation from renewable source”, ACM0002 version 12.1.0

### 1.2 Scope and Criteria

The verification is based on the monitoring report<sup>/MR/</sup>, the monitoring plan as set out in the registered VCS PD<sup>/VCS-PD/</sup>, Supplementary VCS project design<sup>/SUP-PD/</sup>, the validation report<sup>/VAL/</sup>, Supplementary VCS validation report<sup>/SUP-VAR/</sup> emission reduction calculation spreadsheet<sup>/XLS/</sup> and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant and information collected through performing interviews and during the on-site assessment. Furthermore publicly available information was considered as far as available and required.

The TÜV NORD JI/CDM CP has employed a risk-based approach in the verification, focusing on the identification of significant risks and reliability of project monitoring and generation of emission reductions.

## 1.3 Level of assurance

The verification has been planned and organized to achieve a

- ☒ Reasonable level of assurance
- ☐ Limited level of assurance

## 1.4 Summary Description of the Project

The project is a renewable energy project. It has been implemented to produce electricity by using wind, a renewable source of energy. The project activity involves installation of the Wind Turbine Generators (WTGs) in different locations of Madhya Pradesh and Rajasthan with a total installed capacity of 44.40 MW with 44 number of WTGs with rated capacity of 600 kW each (model S-52) and 12 WTGs with rated capacity of 1500 kW each (model S-82). All WTGs involved in the project activity are developed and supplied by Suzlon Energy Limited.

All the WTGs included in the project activity have got commissioned and is operational. First WTG included in the project got commissioned in 26/02/2010 while the last WTG got commissioned on 17/06/2012. The electricity generated by three WTGs of capacity 600 kW each in Madhya Pradesh is being wheeled to the company's plants in the state-Madhya Pradesh and the electricity from the remaining WTGs of 42.60 MW installed capacity is being sold to the respective state utilities. Therefore, the technology of electricity generation from wind power is environment friendly. Suzlon manufacturing facility for WTG and generator is located in India. The WTG thus manufactured by Suzlon has a technical lifetime of 20 years and there is no technology transfer from other country or other sources. The power generation from wind power project is a clean technology as there are no GHG emissions associated with the project activity.

## 2 VERIFICATION PROCESS

### 2.1 Method and Criteria

The verification of the project consisted of the following steps:

- Contract review,
- Appointment of team members and technical reviewers,
- Desk review of the Monitoring Report<sup>/MR/</sup> submitted by the client and additional supporting documents,
- Verification planning,
- On-Site assessment,
- Background investigation and follow-up interviews with personnel of the Project developer and its contractors,
- Draft verification reporting,
- Resolution of corrective actions (if any),
- Final verification reporting,

- Technical review,
- Final approval of the verification

**Table 3-1:** Verification sequence

| Topic                                         | Date                                                         |
|-----------------------------------------------|--------------------------------------------------------------|
| Assignment of verification                    | 19/09/2013                                                   |
| On-site visit                                 | 16/10/2014 (Ratlam)<br>30/12/2014 and 31/12/2014 (Rajasthan) |
| Draft reporting finalised                     | 01/01/2015                                                   |
| Final reporting finalised                     | 12/08/2016                                                   |
| Technical review on final reporting finalised | 27/08/2016                                                   |
| Final corrections                             | 27/08/2016                                                   |

## 2.2 Document Review

The registered VCS project documents; monitoring report<sup>/MR/</sup>, emission reduction sheet<sup>/XLS/</sup> and supporting background documents like monthly Credit Note/JMR issued by distribution licensee on energy delivered to grid by project WTGs<sup>/EGC/</sup>, Calibration certificates<sup>/CAL/</sup> of energy meter used in the project activity, power purchase agreement<sup>/PPA/</sup>, commissioning certificates<sup>/CC/</sup>, breakdown details<sup>/BD/DGR</sup> etc. related to the project design and monitoring were reviewed.

Furthermore, the verification team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data. The references used in the course of this verification are summarized in section 7.

Appointment of team members and technical reviewer

On the basis of a competence analysis and individual availabilities a verification team was appointed. Furthermore also the personnel for the technical review and the final approval were determined.

The list of involved personnel, the tasks assigned and the qualification status are summarized in the table 3-2 below.

**Table 3.2:** Involved Team Members

|                                                                         | Name            | Company   | Function <sup>1)</sup> | Qualification Status <sup>2)</sup> | Scheme competence <sup>3)</sup>     | Technical competence <sup>4)</sup> | Verification competence <sup>5)</sup> | Host country Competence             | On-site visit                       |
|-------------------------------------------------------------------------|-----------------|-----------|------------------------|------------------------------------|-------------------------------------|------------------------------------|---------------------------------------|-------------------------------------|-------------------------------------|
| <input checked="" type="checkbox"/> Mr.<br><input type="checkbox"/> Ms. | Indrapal Parmar | TUV-India | TL/TE                  | LA                                 | <input checked="" type="checkbox"/> | 1.2                                | <input checked="" type="checkbox"/>   | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

|                                                                         | Name       | Company    | Function <sup>1)</sup> | Qualification Status <sup>2)</sup> | Scheme competence <sup>3)</sup>     | Technical competence <sup>4)</sup> | Verification competence <sup>5)</sup> | Host country Competence  | On-site visit            |
|-------------------------------------------------------------------------|------------|------------|------------------------|------------------------------------|-------------------------------------|------------------------------------|---------------------------------------|--------------------------|--------------------------|
| <input type="checkbox"/> Mr.<br><input type="checkbox"/> Ms.            |            |            | -                      | -                                  | <input type="checkbox"/>            | -                                  | <input type="checkbox"/>              | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> Mr.<br><input type="checkbox"/> Ms. | Evgeni Sud | TN Germany | TR/FA <sup>B)</sup>    | SA                                 | <input checked="" type="checkbox"/> | 1.2                                | <input checked="" type="checkbox"/>   | <input type="checkbox"/> | -                        |

<sup>1)</sup> TL: Team Leader; TM: Team Member, TR: Technical review; OT: Observer-Team, OR: Observer-TR; FA: Final approval

<sup>2)</sup> GHG Auditor Status: A: Assessor; LA: Lead Assessor; SA: Senior Assessor; T: Trainee; TE: Technical Expert

<sup>3)</sup> GHG auditor status (at least Assessor)

<sup>4)</sup> As per S01-MU03 or S01-VA070-A2 (such as 1.1, 1.2, ...)

<sup>5)</sup> In case of verification projects

A) Team Member: GHG auditor (at least Assessor status), Technical Expert (incl. Host Country Expert or Verification Expert), not ETE

B) No team member

## 2.3 Interviews

The verification team has carried out interviews in order to assess the information included in the project documentation and to gain additional information regarding the compliance of the project with the relevant criteria applicable for the VCS / ISO 14064. During verification the verification team has performed interviews to confirm selected information and to resolve issues identified in the document review. The main topics of the interviews were summarized in Table 3-4.

**Table 3-4:** Interviewed persons and interview topics

| Interviewed Persons / Entities                                         | Interview topics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project Owner & Operations Personnel,<br>Ruchi Soya Industries Limited | <ul style="list-style-type: none"> <li>General aspects of the project</li> <li>Technical equipment and operation</li> <li>Changes since implementation</li> <li>Monitoring and measurement equipment</li> <li>Remaining issues from validation</li> <li>Calibration procedures</li> <li>Quality management system</li> <li>Involved personnel and responsibilities</li> <li>Training and practice of the operational personnel</li> <li>Implementation of the monitoring plan</li> <li>Monitoring data management</li> <li>Data uncertainty and residual risks</li> </ul> |

| Interviewed Persons / Entities | Interview topics                                                                                                                                                                                                                                  |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                | <ul style="list-style-type: none"> <li>• GHG calculation</li> <li>• Procedural aspects of the verification</li> <li>• Maintenance</li> <li>• Environmental aspects</li> <li>• Editorial issues of the Monitoring Report<sup>/MR/</sup></li> </ul> |

## 2.4 Site Inspections

The verification team has carried out an inspection on site in order to verify that the project is implemented in accordance with the applicable criteria. Furthermore the on-site assessment was conducted and monitoring data were checked with respect to accuracy to ensure the calculation of emission reductions. The main tasks covered during the site visit include,

- The on-site assessment included an investigation of whether all relevant equipment is installed and works as anticipated.
- The operating staff was interviewed<sup>/M01/</sup> and observed in order to check the risks of inappropriate operation and data collection procedures.
- Information processes for generating, aggregating and reporting the selected monitored parameters were reviewed.
- The duly calibration of all metering equipment was checked.
- The monitoring processes, routines and documentations were audited to check their proper application.
- The monitoring data were checked completely.
- The data aggregation trails were checked via spot sample down to the level of the meter recordings.

## 2.5 Resolution of findings

Material discrepancies identified in the course of the verification are addressed either as CARs, CLs or FARs.

A Corrective Action Request (CAR) is established where:

- mistakes have been made in assumptions, application of the methodology or the project documentation which will have a direct influence the project results,
- the requirements deemed relevant for verification of the project with certain characteristics have not been met or
- there is a risk that the project would not be registered or that emission reductions would not be able to be verified and certified.

A Clarification Request (CL) will be issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

A Forward Action Request (FAR) will be issued when certain issues related to project implementation should be reviewed during the first verification. A detailed list of the CARs CLs and FAR raised and discussed in the course of this verification is included in the next section 4 of this report.

### **2.5.1 Forward Action Requests**

There are not any Forward Action Requests for the project activity. Same is verified by validation team from the registered VCS validation report.

## **2.6 Eligibility for Validation Activities**

Since the validation of the project under VCS is already carried out so, this section is not applicable.

### **Draft Verification Report**

After reviewing all relevant documents and taken all other relevant information into account, the assessment team issues all findings in the course of a draft verification report and hands this report over to the project proponent in order to respond on the issues raised and to revise the project documentation accordingly.

### **Final Verification Report**

The final verification starts after issuance of the proposed corrective action (CA) of the CARs CLs and FARs by the project proponent. The project proponent has to reply on those and the requests are “closed out” by the assessment team in case the response is assessed as sufficient. In case of raised FARs the project proponent has to respond on this, identifying the necessary actions to ensure that the topics raised in this finding are likely to be resolved at the latest during the subsequent verification. The assessment team has to assess whether the proposed action is adequate or not.

In case the findings from CARs and CLs cannot be resolved by the project proponent or the proposed action related to the FARs raised cannot be assessed as adequate, no positive verification opinion can be issued by the assessment team.

### **Technical review**

Before submission of the final verification report a technical review of the whole verification procedure is carried out. The technical reviewer is a competent GHG auditor being appointed for the scope this project falls under. The technical reviewer is not considered to be part of the verification team and thus not involved in the decision making process up to the technical review.

As a result of the technical review process the verification opinion and the topic specific assessments as prepared by the verification team leader may be confirmed or revised. Furthermore reporting improvements might be achieved.

## Final approval

After successful technical review of the final report an overall (esp. procedural) assessment of the complete verification will be carried out by a senior assessor located in the accredited premises of TÜV NORD. Only after this step the request for issuance can be started (in case of a positive validation opinion).

### 3 VALIDATION FINDINGS

#### 3.1 Participation under Other GHG Programs

The 44.40 MW project activity is registered VCS project. Validation has found that the project activity has been taken in two projects – 33.60 MW and 10.80 MW separately under CDM. The project has participated under CDM i.e. any other GHG program. An undertaking to confirm the same was submitted by project proponent to the DoE during VCS validation as well as during the verification of the current monitoring period of the project.

Assessment on the project description in line with the additional information provided in the supplementary VCS project description is as below.

#### 3.2 Methodology Deviations

Since the validation of the project under VCS is already carried out so, this section is not applicable

#### 3.3 Project Description Deviations

Since the validation of the project under VCS is already carried out so, this section is not applicable.

#### 3.4 Grouped Project

Since the validation of the project under VCS is already carried out so, this section is not applicable.

### Validation Findings

#### Gap Validation

The 44.40 MW project activity is registered VCS project. Validation has found that the project activity has been taken in two projects – 33.60 MW and 10.80 MW separately under CDM. The project has participated under CDM i.e. any other GHG program. An undertaking to confirm the same was submitted by project proponent to the DoE during VCS validation as well as during the verification of the current monitoring period of the project.

Assessment on the project description in line with the additional information provided in the supplementary VCS project description is as below.

### New Project Activity Instances

Same as above

### Validation Conclusion

Same as above

## 4 VERIFICATION FINDINGS

In this section the assessments and findings from the desk review of the VCS PD / GHG Report PD, site visit, interviews and supporting documents as well as the final assessments are summarised. Table 4-1 includes an overview of all raised CARs, CLs and FARs.

**Table 4-1:** Overview of CARs, CLs and FARs issued

| No. | Topic / Chapter                                                  | CAR       | CL        | FAR       |
|-----|------------------------------------------------------------------|-----------|-----------|-----------|
| 4.1 | Project implementation status                                    | 01        | 01        | 00        |
| 4.2 | Accuracy of GHG emission reduction or Removal calculations       | 03        | 00        | 00        |
| 4.3 | Quality of evidence to determine emission reductions or removals | 02        | 00        | 00        |
| 4.4 | Management and operational system                                | 00        | 00        | 00        |
|     | <b>SUM</b>                                                       | <b>06</b> | <b>01</b> | <b>00</b> |

### 4.1 Project Implementation Status

#### Description

The project is a renewable energy project. It has been implemented to produce electricity by using wind, a renewable source of energy. The project activity involves installation of the Wind Turbine Generators (WTGs) in different locations of Madhya Pradesh and Rajasthan with a total installed capacity of 44.40 MW with 44 number of WTGs with rated capacity of 600 kW each (model S-52) and 12 WTGs with rated capacity of 1500 kW each (model S-82). All WTGs involved in the project activity are developed and supplied by Suzlon Energy Limited. Suzlon Infrastructure Services Limited (SISL).

All the WTGs included in the project activity have got commissioned and is operational. First WTG included in the project got commissioned in 26/02/2010 while the last WTG got commissioned on 17/06/2012. The electricity generated by three WTGs of capacity 600 kW each in Madhya Pradesh is being wheeled to the company's plants in the state-Madhya Pradesh and the electricity from the remaining WTGs of 42.60 MW installed capacity is being sold to the respective state utilities

It has been verified that the project is implemented as it is described in the validated project description<sup>/VCS PD/</sup>. All the measuring equipments required for the project monitoring are installed at the respective places of project site. The crediting period selected for the project activity as per the validated VCS PD<sup>/PD02/</sup> is from 26/02/2010 to 25/02/2020. Project proponent has chosen 10 years of fixed crediting period for this project activity. Starting date of the crediting period is 26/02/2010 which is the earliest commissioning date<sup>/CC/</sup> among all the WTGs. Verification team has also reviewed the documents related first monitoring period spans the duration from 26/02/2010 to 12/12/2012.

The project activity monitors the following monitoring parameters as part of the project activity.

1. Quantity of net electricity supplied to the grid as a result of the implementation of the project activity in year  $y$   $EG_{PJ, y}$  (in MWh).
2. Electricity exported to the grid by the project activity in year  $y$   $EG_{export, y}$  (in MWh)
3. Electricity imported from the grid by the project activity in year  $y$   $EG_{import, y}$  (in MWh)

The net electricity supplied to a grid is calculated as the difference between the measured quantities of the grid electricity export and the import. The same is a calculated value which is sourced directly from the monthly Credit Note/JMR issued by distribution licensee<sup>/EGC/</sup> in Rajasthan and Madhya Pradesh state of India. The monthly electricity generation data for entire months of the monitoring period has been cross-checked by verification team with the invoices<sup>/INV/</sup> raised for sale of the electricity by the project proponent and found to be correct.

The project has been in the continual and successful operation during the requested monitoring period. None of the major technical equipment has been found to be exchanged during the monitoring period except for routine operation and maintenance services<sup>/O&M/</sup>. The technical specification<sup>/TS/</sup> of the WTGs and energy meters including serial number, rated capacity etc. have been verified during onsite verification conducted by the verification team at both the locations. The commissioning certificate<sup>/CC/</sup> of the WTG is also verified and found to be appropriate. The technical specifications<sup>/TS/</sup> of the measuring equipments were physically verified during onsite verification and found to be appropriate.

Essential data of the project is presented in the following Table 4-1a.

**Table 4-1a:** Project Characteristics

| Item                            | Data                                                                                                                                                                                                                    |   |        |            |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--------|------------|
| Project title                   | 44.40 MW Wind Energy Project by Ruchi Soya Industries Limited, India                                                                                                                                                    |   |        |            |
| Project owner                   | Ruchi Soya Industries Limited                                                                                                                                                                                           |   |        |            |
| Any specific project categories | <input checked="" type="checkbox"/> Project: Less than or equal to 300,000 tonnes of CO <sub>2</sub> e per year.<br><input type="checkbox"/> Large projects: Greater than 300,000 tonnes of CO <sub>2</sub> e per year. |   |        |            |
| VCS PD/GHG Report PD dated      | Draft:                                                                                                                                                                                                                  | - | Final: | 26/09/2011 |
| Applied Methodology             | Consolidated baseline methodology for grid-connected electricity generation from renewable source", ACM0002 version 12.1.0                                                                                              |   |        |            |
| Project starting date           | 26/02/2010 <sup>1</sup>                                                                                                                                                                                                 |   |        |            |
| Crediting period                | <input type="checkbox"/> Renewable Crediting Period (7 y)<br><input checked="" type="checkbox"/> Fixed Crediting Period (10 y)                                                                                          |   |        |            |
| Start of crediting period       | 26/02/2010                                                                                                                                                                                                              |   |        |            |

The details of the project location are given in table 4-1b:

**Table 4-1b:** Project Location

| No.          | Project Location |
|--------------|------------------|
| Host Country | India            |

<sup>1</sup> The project start date is the date on which the project began generating GHG emission reductions. The first WTG of the project activity commissioned on 26/02/2010 and started generating GHG emission reductions. Therefore, Project Start Date is 26/02/2010

|                           |                                           |
|---------------------------|-------------------------------------------|
| Region:                   | State- Rajasthan<br>State: Madhya Pradesh |
| Project location address: | As mentioned below                        |
| Latitude:                 | As mentioned below                        |
| Longitude:                | As mentioned below                        |

| S. No | Physical Location                                                            | Rated Capacity (kW) | Location No. | Latitude       | Longitude      |
|-------|------------------------------------------------------------------------------|---------------------|--------------|----------------|----------------|
| 1.    | Village-Naulakha, Taluka-Piploda, District - Ratlam (Madhya Pradesh)         | 600                 | NL-1         | 23°38'23.0" N  | 74°59'12.7" E  |
|       |                                                                              | 600                 | NL-2         | 23°38'25.9" N  | 74°59'07.1" E  |
|       |                                                                              | 600                 | NL-3         | 23°38'37.3" N  | 74°59'13.1" E  |
|       |                                                                              | 600                 | NL-4         | 23°38'45.1" N  | 74°59'25.7" E  |
|       |                                                                              | 600                 | NL-5         | 23°38'35.9" N  | 74°59'33.3" E  |
|       |                                                                              | 600                 | NL-6         | 23°38'25.9" N  | 74°59'39.7" E  |
|       |                                                                              | 600                 | NL-7         | 23°38'17.1" N  | 74°59'39.4" E  |
|       |                                                                              | 600                 | NL-8         | 23°38'21.9" N  | 74°59'53.7" E  |
|       |                                                                              | 600                 | NL-9         | 23°38'33.5" N  | 75°00'00.2" E  |
|       |                                                                              | 600                 | NL-10        | 23°38'43.1" N  | 75°00'00.2" E  |
| 2.    | Village-Padliya Umat, Taluka-Piploda, District - Ratlam (Madhya Pradesh)     | 600                 | JO-10        | 23°35'51.6" N  | 75°04'44.1" E  |
|       |                                                                              | 600                 | JO-08        | 23°35'45.5" N  | 75°04'47.9" E  |
| 3.    | Village-Bargad, Taluka-Piploda, District - Ratlam (Madhya Pradesh)           | 600                 | JO-12        | 23°36'10.3" N  | 75°04'30.3" E  |
|       |                                                                              | 600                 | JO-13        | 23°36'17.2" N  | 75°04'26.6" E  |
| 4.    | Village-Hariyakheda, Taluka-Piploda, District - Ratlam (Madhya Pradesh)      | 600                 | JO-14        | 23°36'23.7" N  | 75°04'24.3" E  |
|       |                                                                              | 600                 | JO-15        | 23°36'31.0" N  | 75°04'21.8" E  |
|       |                                                                              | 600                 | JO-16        | 23°36'37.7" N  | 75°04'20.8" E  |
|       |                                                                              | 600                 | JO-17        | 23°36'45.9" N  | 75°04'15.2" E  |
|       |                                                                              | 600                 | JO-18        | 23°36'59.3" N  | 75°04'12.6" E  |
|       |                                                                              | 600                 | JO-19        | 23°37'05.9" N  | 75°02'48.5" E  |
| 5.    | Village-Chourasi Badayla, Taluka-Piploda, District - Ratlam (Madhya Pradesh) | 600                 | JO-03        | 23°34' 46.9" N | 75°05' 46.8" E |
|       |                                                                              | 600                 | JO-04        | 23°34' 53.5" N | 75°05' 48.4" E |
|       |                                                                              | 600                 | JO-05        | 23°34' 57.2" N | 75°05' 22.1" E |
| 6.    | Village-Uperwada, Taluka-Piploda, District - Ratlam (Madhya Pradesh)         | 600                 | JO-20        | 23°36' 46.5" N | 75°02' 20.9" E |
|       |                                                                              | 600                 | JO-21        | 23°36' 38.2" N | 75°02' 21.7" E |
|       |                                                                              | 600                 | JO-22        | 23°36' 58.6" N | 75°02' 46.0" E |
| 7.    | Village-Akal, Taluka-                                                        | 1500                | AK-400       | 26°47'17.3" N  | 77°05'12.0" E  |

|     |                                                                                          |      |         |               |               |
|-----|------------------------------------------------------------------------------------------|------|---------|---------------|---------------|
|     | Fatehgarh, District-Jaisalmer<br>(Rajasthan)                                             | 1500 | AK-401  | 26°47'05.0" N | 77°05'25.3" E |
|     |                                                                                          | 1500 | AK-414  | 26°48'12.4" N | 77°05'06.8" E |
|     |                                                                                          | 1500 | AK-415  | 26°48'33.5" N | 77°05'23.5" E |
|     |                                                                                          | 1500 | AK-416  | 26°48'25.6" N | 77°05'35.8" E |
|     |                                                                                          | 1500 | AK-417  | 26°48'12.2" N | 77°05'46.1" E |
|     |                                                                                          | 1500 | AK-253  | 26°47'51.2" N | 77°08'14.0" E |
|     |                                                                                          | 1500 | AK-308  | 26°47'56.9" N | 77°08'55.6" E |
| 8.  | Villages-Belwa Ranaji & Sagat<br>Nagar, Taluka-Shergarh,<br>District-Jodhpur (Rajasthan) | 1500 | RKB-075 | 26°30'52.3" N | 72°32'22.2" E |
|     |                                                                                          | 1500 | RKB-076 | 26°30'05.7" N | 72°31'06.4" E |
| 9.  | Village-Dhundhariya, Taluka-<br>Osiyan, District-Jodhpur<br>(Rajasthan)                  | 1500 | OS-48   | 26°43'57.6" N | 72°56'43.1" E |
|     |                                                                                          | 1500 | OS-49   | 26°43'55.5" N | 72°56'59.5" E |
| 10. | Village-Gopalpura, Taluka-<br>Ratlam, District-Ratlam<br>(Madhya Pradesh)                | 600  | PR-01   | 23°23'26.4"N  | 74°55'27.1"E  |
|     |                                                                                          | 600  | PR-02   | 23°23'20.8"N  | 74°55'23.1"E  |
|     |                                                                                          | 600  | PR-03   | 23°23'14.9"N  | 74°55'13.4"E  |
|     |                                                                                          | 600  | PR-04   | 23°23'08.1"N  | 74°55'10.8"E  |
|     |                                                                                          | 600  | PR-05   | 23°23'01.5"N  | 74°55'07.9"E  |
|     |                                                                                          | 600  | PR-06   | 23°22'44.6"N  | 74°55'08.1"E  |
|     |                                                                                          | 600  | PR-08   | 23°22'29.6"N  | 74°55'14.0"E  |
|     |                                                                                          | 600  | PR-17   | 23°22'54.0"N  | 74°55'12.0"E  |
| 11. | Village-Rampuriya, Taluka-<br>Ratlam, District-Ratlam<br>(Madhya Pradesh)                | 600  | PR-19   | 23°23'18.0"N  | 74°55'36.6"E  |
|     |                                                                                          | 600  | PR-09   | 23°22'25.6"N  | 74°55'24.6"E  |
|     |                                                                                          | 600  | PR-10   | 23°21'59.1"N  | 74°55'34.4"E  |
|     |                                                                                          | 600  | PR-11   | 23°21'25.3"N  | 74°55'11.9"E  |
|     |                                                                                          | 600  | PR-12   | 23°21'34.5"N  | 74°55'30.8"E  |
|     |                                                                                          | 600  | PR-13   | 23°21'41.6"N  | 74°55'31.2"E  |
|     |                                                                                          | 600  | PR-14   | 23°21'47.8"N  | 74°55'32.0"E  |
|     |                                                                                          | 600  | PR-15   | 23°21'53.8"N  | 74°55'32.6"E  |
|     |                                                                                          | 600  | PR-16   | 23°21'28.2"N  | 74°55'29.2"E  |
|     |                                                                                          | 600  | PR-18   | 23°21'21.8"N  | 74°55'23.6"E  |

Table 4-1c: Technical Specification<sup>/TS/</sup> of the WTG:

| Parameter                   | Technical specification of<br>1500 kW- S 82                                                                       | Technical specification of 600 kW<br>MW- S 52      |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| <b>Rotor</b>                |                                                                                                                   |                                                    |
| Installed electrical output | 1500 kW                                                                                                           | 600 kW                                             |
| Cut-in wind speed           | 4 m/s                                                                                                             | 4 m/s                                              |
| Rotor Diameter              | 82 m                                                                                                              | 52 m                                               |
| Cut-out wind speed          | 25 m/s                                                                                                            | 20 m/s (10–minutes average)                        |
| <b>Generator</b>            |                                                                                                                   |                                                    |
| Type                        | Single speed induction<br>generator with slip rings,<br>variable rotor resistance via<br>Suzlon Flexi slip system | Single speed induction generator<br>(asynchronous) |
| Rates output                | 1500 kW                                                                                                           | 600 kW                                             |

|                   |                           |                                     |
|-------------------|---------------------------|-------------------------------------|
| Rotational speed  | 1511 RPM                  | 1539 rpm                            |
| Operating voltage | 690 V AC (phase to phase) | 690 V AC (phase to phase)           |
| Cooling system    | Air cooled                | Air cooled                          |
| Gear Box Type     | 1 planetary and 2 helical | 1 planetary stage, 2 helical stages |

## Related Findings

- ☐ No CARs, CLs or FARs have been identified in this context
- ☒ The following finding(s) have been addressed:

| Finding:                                                                                                                                                                                  | CAR 5.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                             |                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------------------|
| <b>Classification</b>                                                                                                                                                                     | <input checked="" type="checkbox"/> CAR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <input type="checkbox"/> CL | <input type="checkbox"/> FAR |
| <b>Description of finding</b><br><i>Describe the finding in unambiguous style; address the context (e.g. section)</i>                                                                     | Technical detail of the WTGs included in the project activity is missing in the monitoring report. Refer registered VCS-PD in this regard.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                             |                              |
| <b>Corrective Action #1</b><br><i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>                                                    | Technical details of the WTGs in line to the registered VCS- PD is now updated in the revised MR. DOE is requested to kindly refer the revised Monitoring Report for its assessment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                             |                              |
| <b>DOE Assessment #1</b><br><i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.</i> | Revised monitoring report <sup>/MR/</sup> now correctly includes the technical specifications of 600 kW WTG having model S-52 and 1500 kW having model S-82. This was also verified during the site visit the installed capacities of the WTGs installed under project activity have been checked with technical specifications <sup>/TS/</sup> by the verification team. Further, during the site visit and subsequent interview with client it was found that the project activity involves installation and operation of 44 WTGs with rated capacity of 600 kW each (model S-52) and 12 WTGs with rated capacity of 1500 kW each (model S-82).<br><u>CAR is closed now.</u> |                             |                              |
| <b>Conclusion</b><br><i>Tick the appropriate checkbox</i>                                                                                                                                 | <input type="checkbox"/> To be checked during the next periodic verification<br><input type="checkbox"/> Additional action should be taken (finding remains open)<br><input checked="" type="checkbox"/> The finding is closed                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                             |                              |

| Finding:                                                                                                              | CAR 5.2                                                                                                                               |                                        |                              |
|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|
| <b>Classification</b>                                                                                                 | <input type="checkbox"/> CAR                                                                                                          | <input checked="" type="checkbox"/> CL | <input type="checkbox"/> FAR |
| <b>Description of finding</b><br><i>Describe the finding in unambiguous style; address the context (e.g. section)</i> | Clarification is requested w.r.t information mentioned in registered VCS-PD; section 1.12.3 "Participation under Other GHG Programs". |                                        |                              |

|                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Corrective Action #1</b><br/>This section shall be filled by the PP. It shall address the corrective action taken in details.</p>                                                    | <p>The project activity has also participated under the other GHG programs i.e. CDM. Under CDM mechanism, the project activity has been registered under two separate projects; 33.60 MW (CDM project reference no. 8592) &amp; 10.80 MW (CDM project reference no. 8818).</p> <p>However, to avoid the double counting of GHG emission, project participant is claiming VCUs one days prior to 13 December 2012, which is the start date of crediting period for 33.60 MW, project referred as 8592 under CDM programme.</p> <p>Hence PP, has claimed VCUs only for the monitoring period 26-02-2010 to 12-12-2012 (both days inclusive).</p>                                                                                                                                                                      |
| <p><b>DOE Assessment #1</b><br/>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.</p> | <p>Justification submitted by project proponent is accepted by verification team along with the declaration<sup>/DEC/</sup> submitted by PP. Since, the both the projects (i.e. 33.60 MW and 10.80 MW) are registered under CDM and project 44.40 MW project is also registered under VCS standard. Therefore, project proponent is claiming emission reductions for the period from date of commissioning to the date prior to date of registration of CDM project. Verification team has checked the status of both the projects from UNFCCC webpage. Verification team checked the declaration letter submitted by project proponent to confirm and ensure that the project will not lead to double counting of the GHG removals for the current monitoring period from the project activity. CAR is closed.</p> |
| <p><b>Conclusion</b><br/>Tick the appropriate checkbox</p>                                                                                                                                 | <p><input type="checkbox"/> To be checked during the next periodic verification<br/> <input type="checkbox"/> Additional action should be taken (finding remains open)<br/> <input checked="" type="checkbox"/> The finding is closed</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

#### Final Assessment

☒ The project is in line with the VCS requirements w.r.t this issue.

## 4.2 Accuracy of GHG Emission Reduction or Removal Calculations

The project proponent has submitted the emission reduction calculation excel sheet with respect to the monitoring report<sup>/MR/</sup>. An elaborate calculation for the emission reduction including the values of the monitoring parameters is provided in the emission reduction calculation sheet. The calculation procedure along with the equations used for the calculation is verified by the verification team and found to be correct and in line with the validated VCS PD<sup>/VCS PD/</sup> and applied Consolidated baseline methodology for grid-connected electricity generation from renewable source", ACM0002 version 12.1.0<sup>/ACM/</sup>.

As per registered VCS PD, validation report the baseline emissions reductions are based on the net electricity exported to the grid by the Wind power project activity located in Rajasthan and Maharashtra. The project activity is based on renewable wind energy, therefore, project emissions should not be considered as per methodology ACM0002. Also, as per the methodology the leakage emission taken as zero (as the project activity is based on renewable wind energy) for this project activity. Therefore the baseline emission equals the Emission Reductions. The formula used to calculate the baseline emission is as per the registered CDM PDD and applied methodology ACM0002. The baseline emissions are

calculated as a product of measured value of net electricity supplied to the grid and emission factor evaluated ex-ante for NEWNE regional grid of India.

The monitoring system and all applied procedures are completely in compliance to the applied methodology ACM0002, Version 12.1.0 and monitoring plan of the registered VCS PD.

The emission reduction calculation is based on the actual monitoring values of the following monitoring parameters. The conformity of the monitoring parameters with the validated VCS PD is assessed as below.

| S.I No. | Parameters                                                                                                                                   | Measurement procedure                                                                                                                                                                                                                                                                                                                                                  | Source of the data                                                                                    | Means of verification                                                                                                                                                                                                                                                                                                                                              |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1       | Quantity of net electricity supplied to the grid as a result of the implementation of the project activity in year y<br>$EG_{PJ,y}$ in (MWh) | This monitoring parameter is calculated parameter based on the other monitoring parameter i.e. export and import values. And is calculated as the difference of the monthly export and import electricity generation values to get the net electricity supplied to the grid.                                                                                           | Monthly share of electricity generation certificate for the entire monitoring period <sup>/EGC/</sup> | The quantity of net electricity supplied to the grid on monthly basis is crosschecked with the monthly invoice <sup>/INV/</sup> raised by the project proponent to DISCOM's in Rajasthan and Madhya Pradesh                                                                                                                                                        |
| 2       | Electricity exported to the grid by the project activity in year y<br>$EG_{export,y}$ (in MWh)                                               | Monthly exported electricity generation data is measured by the main meters installed and readings are jointly recorded by DISCOM personnel and representative of power producer. The monthly readings are replicated in the share of electricity certification. The same values are used in the ER spreadsheet and finally in the monitoring report <sup>/MR/</sup> . | Monthly share of electricity generation certificate for the entire monitoring period <sup>/EGC/</sup> | The monitored value of the parameter i.e. Quantity of electricity exported to the grid is sourced from the monthly share of electricity certificate given by the DISCOM. The values complied in soft form were verified by the verification team and their correctness was ensured from the monthly share of electricity generation certificate <sup>/EGC/</sup> . |

|   |                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                    |
|---|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3 | Electricity imported from the grid by the project activity in year y<br><br>$EG_{import,y}$<br><br>(in MWh) | Monthly imported electricity generation data is measured by the main meters installed and readings are jointly recorded by DISCOM personnel and representative of power producer. The monthly readings are replicated in the share of electricity certification. The same values are used in the ER spreadsheet and finally in the monitoring report <sup>/MR/</sup> . | Monthly share of electricity generation certificate for the entire monitoring period <sup>/EGC/</sup> | The monitored value of the parameter i.e. Quantity of electricity imported to the grid is sourced from the monthly share of electricity certificate given by the DISCOM. The values complied in soft form were verified by the verification team and their correctness was ensured from the monthly share of electricity generation certificate <sup>/EGC/</sup> . |
|---|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Net Electricity Exported to the grid by the project activity WTGs is calculated based on the following formula:

$EG_{PJ,y}$  in (MWh) is calculated as the difference between  $EG_{export,y}$  and  $EG_{import,y}$

Where;

$EG_{Export}$  = Electricity exported by the project activity (MWh)

$EG_{Import}$  = Electricity Imported from the grid (MWh)

Therefore,  $EG_{facility,y} = 161,445.28$  MWh

Baseline emission ( $BE_y$ ) is calculated as per applied methodology ACM0002, for new grid connected renewable power plant, the baseline emissions are the product of electricity produced by renewable energy generating unit multiplied by the emission factor of the NEWNE grid which is as follows:

Baseline Emissions  $BE_y = EG_{PJ,y} \times EF_{Grid,CM,y}$

Where:

$BE_y$  = Baseline emissions of the project activity in the year y (tCO<sub>2</sub>)

$EG_{PJ,y}$  = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)

$EF_{grid,CM,y}$  = Combined margin CO<sub>2</sub> emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system, ver. 02.2.1" (tCO<sub>2</sub>/MWh)

Emission Factor for NEWNE grid,  $EF_{grid,y} = 0.94865$  tCO<sub>2</sub>/MWh

Hence,

$BE_y = 161,445.28 \text{ MWh} \times 0.94865 \text{ tCO}_2/\text{MWh}$   
= 153,155 tCO<sub>2</sub>

As provided in the methodology, emission reduction is calculated from the equation:

$$ER_y = BE_y - PE_y - LE_y$$

1.  $BE_y$ : Baseline emissions in the year  $y$  (tCO<sub>2</sub>e)
2.  $PE_y$ : Project emissions in the year  $y$  (tCO<sub>2</sub>e)
3.  $LE_y$ : Leakage emissions in the year  $y$  (tCO<sub>2</sub>e)
4.  $ER_y$ : Emission Reductions in the year  $y$  (tCO<sub>2</sub>e)

Since, project and leakage emissions are considered zero as per applied methodology and registered CDM PDD. Therefore, Emission reductions for the current monitoring period are calculated as  $ER = BE$

Hence, emission reduction for the present monitoring period ( $ER$ ) =  $BE_y = 153,155$  tCO<sub>2</sub>e

## Procedure used for apportioning has been assessed as follows:

For the project activity monthly meter readings are taken and certified jointly by the representatives of the respective state DISCOM's and the O&M contractor i.e. Suzlon on behalf of WTG owners. The net electricity supplied by individual WTG is determined by the process of allocating the total electricity recorded at the main/check meter to the individual WTG is determined by the process of allocating the total electricity recorded at the main meter to the individual WEC in proportion to the electricity generation recorded by the LCS meters at the individual WTG. The apportioning for electricity export and import is done by DISCOM based on which invoices<sup>/INV/</sup> are raised for individual customers. The net energy supplied by WTGs ( $EG_{PJ,y}$ ) of the project activity is calculated using apportioning procedure as per the following formula.

### Formula 1: Export and Import Multiplication Factor

a) Export Multiplication Factor ( $M_i$ ) =  $EG_{\text{export}} / EG_{1,\text{sum}}$

b) Import Multiplication Factor ( $m_i$ ) =  $EG_{\text{import}} / EG_{1,\text{sum}}$

Where;

- $EG_{\text{export}}$  = Electricity exported to the grid by all WTGs (connected to a substation and/or feeder meter) as recorded at the main meter
- $EG_{\text{import}}$  = Electricity imported to the grid by all WTGs (connected to a substation and/or feeder meter) as recorded at the main meter. Since, the individual controller meter does not record import. Therefore, apportioning for energy imported by each WTG is also done on the basis of electricity exported and recorded at controller of each WTG and the total electricity imported by all WTGs as recorded at the main meter.
- $EG_{1,\text{sum}}$  = Sum of the electricity exported by all individual WTGs (connected to a substation and/or feeder meter) as recorded at WTG controller panel

### Formula 2: Apportioning of export & import for each WTG(s)

c) Electricity exported to the grid from  $i_{th}$  WTG  $EG_{\text{export}_i} = M_i \times EG_{1,i}$

d) Electricity import from the grid from  $i_{th}$  WTG  $EG_{\text{import}_i} = m_i \times EG_{1,i}$

Where,

$M_i$  = Export Multiplication Factor as calculated above

$m_i$  = Import Multiplication Factor as calculated above

$EG_{1,i}$  = Electricity exported by  $i_{th}$  WTG as recorded at the controller panel

So, Net electricity exported to grid by ith WTG ( $EG_{Py,i}$ ) =  $EG_{export,i}$  –  $EG_{import,i}$  which is equivalent to formula used in section 4.2 above for Net Electricity Exported to the grid by the project activity WTGs as

$EG_{PJ,y}$  in (MWh) is calculated as the difference between  $EG_{export,y}$  and  $EG_{import,y}$

Where;

$EG_{Export}$  = Electricity exported by the project activity (MWh)

$EG_{Import}$  = Electricity Imported from the grid (MWh)

PP is issuing the monthly invoices<sup>/INV/</sup> to distribution company (DISCOM) based on the net electricity generation value indicated in the monthly electricity share certificate/credit note<sup>/EGC/</sup>. Based on the net electricity values indicated in invoice<sup>/INV/</sup> and in monthly electricity share certificate share certificate or credit note<sup>/EGC/</sup>, DISCOM makes relevant payment to PP.

All the metering equipment at substation at Osian, RKB, Akal (in Rajasthan) and Jaora, Palsodi (in Madhya Pradesh) are under custody of state nodal agencies and they are duly inspected & calibrated<sup>/CAL/</sup> by state utility once in five year. Calibration and energy meter details for the meters are listed in section Annexure 2- Reference section. During the current monitoring period calibration of the energy meters of the following locations was found to be delayed

- both main and check meters installed at the Akal substation at Rajasthan could not be carried out within due date of calibration for the period from Feb-2010 to March-2011
- both main and check meters installed at the Osian & RKB substation at Rajasthan could not be carried out within due date of calibration for the period from Feb-2010 to March-2012
- both main and check meters installed at the Jaora (Madhya Pradesh) substation at Rajasthan could not be carried out within due date of calibration for the period from April-2011 to Nov-2012

Therefore, for the delayed period i.e. for month of the monitoring period error factors have been applied in the energy export and energy import values to get the net energy supplied to the grid for conservative calculation of emission reduction value. Error applied for the calculation of net electricity for emission reduction is in line with the CDM Validation and Verification Standard, Version 09.0. Verification team has verified all the calibration certificate<sup>/CAL/</sup> of the energy meters and results of the calibration to confirm that the error applied for the delayed period is correct and appropriate. Therefore, it is concluded by verification team that the emission reduction calculated for the current monitoring period are correct and conservative. Further, there was not any significant period of shut-down or break-down period during the monitoring period.

All necessary monitoring instruments operating procedures for the project have been implemented in an appropriate manner. In this project, energy meters with 0.2s accuracy have been installed for monitoring of the electricity export and import at respective substation where project activity WTGs are connected.

Based on the net quantity of the electricity supplied to grid by the project WTGs the correct values are used in the emission reduction calculation<sup>/XLS/</sup> are correct and justification used for the calculation is consistent with the registered VCS PD and applied methodology and related tools. Further the ex-ante fixed values and default values have been applied correctly in line with VVS version 9.0.

## Related Findings

- ☐ No CARs, CLs or FARs have been identified in this context
- ☒ The following finding(s) have been addressed:

| Finding:                                                                                                                                                                                  | CAR 5.2.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                             |                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------------------|
| Classification                                                                                                                                                                            | <input checked="" type="checkbox"/> CAR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <input type="checkbox"/> CL | <input type="checkbox"/> FAR |
| <b>Description of finding</b><br><i>Describe the finding in unambiguous style; address the context (e.g. section)</i>                                                                     | <ul style="list-style-type: none"> <li>As per registered VCS-PD section 4.2 “Quantity of net electricity supplied to the grid” as depicted in Joint meter reading report / Credit report (Madhya Pradesh &amp; Rajasthan) is be cross checked with cross-checked with the invoices raised. However, same are not yet to be submitted to verification team.</li> <li>Generation certificate and break sheet is missing for the month Dec-2010 and Dec 2011 for which apportioning is carried out by project proponent.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                              |
| <b>Corrective Action #1</b><br><i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>                                                    | <ul style="list-style-type: none"> <li>Supporting documents to cross check, Quantity of net electricity supplied to the grid, is now been submitted to verification team.</li> <li>Generation certificate and break up sheet missing for the month Dec-2010 and Dec 2011 is now submitted. DOE is requested to kindly refer revised submissions.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                             |                              |
| <b>DOE Assessment #1</b><br><i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.</i> | <ul style="list-style-type: none"> <li>Project proponent has now submitted the complete set of monthly electricity generation certificate<sup>/EGC/</sup> i.e. Joint meter reading report / Credit report (for Madhya Pradesh &amp; Rajasthan) electricity generation statement<sup>/EGC/</sup> and corresponding copies of invoices<sup>/INV/</sup> for entire months of the monitoring period. Verification team has crosschecked the generation values from the monthly invoices<sup>/INV/</sup> submitted by project proponent and found them to be correct and accurate. Verification team has further crosschecked the values from the revised ER and MR sheet submitted by client and found them also correct. CAR is closed now.</li> <li>Quantity of net electricity supplied to the grid as depicted in Generation certificate and break sheet is now submitted by project proponent for the month Dec-2010 and Dec 2011. Verification team has checked the apportioning calculation provided for said months in the ER sheet to confirm that electricity generation for the months are correct and conservative. CAR is closed.</li> </ul> |                             |                              |

| Finding:                                                  | CAR 5.2.1                                                                                                                                                                                                                      |
|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Conclusion</b><br><i>Tick the appropriate checkbox</i> | <input type="checkbox"/> To be checked during the next periodic verification<br><input type="checkbox"/> Additional action should be taken (finding remains open)<br><input checked="" type="checkbox"/> The finding is closed |

| Finding:                                                                                                                                                                                  | CAR 5.2.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Classification</b>                                                                                                                                                                     | <input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Description of finding</b><br><i>Describe the finding in unambiguous style; address the context (e.g. section)</i>                                                                     | <ul style="list-style-type: none"> <li>Section 4.4 of the monitoring report: Emission reduction formula used for emission reduction calculation is not in line with the applied methodology used in the project activity.</li> <li>Ex-ante emission reduction estimate states the ER value as 86,477 tCO<sub>2</sub> per annum which is not in line with information stated in registered VCS-PD. Revised the description accordingly.</li> </ul>                                                                                                                                                                                                                                                                                                                                     |
| <b>Corrective Action #1</b><br><i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>                                                    | <ul style="list-style-type: none"> <li>In line to the applied methodology used in the project activity, Emission reduction formula used for emission reduction calculation is been updated.</li> <li>In line to the registered VCS – PD the ex-ante emission reduction estimate is been revised to 81,853 tCO<sub>2</sub> per annum in the revised version of MR.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>DOE Assessment #1</b><br><i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.</i> | <ul style="list-style-type: none"> <li>Section 4.4 of the revised MR now correctly includes the ex-ante emission reductions value as 81,853 tCO<sub>2</sub> per annum emission reduction formula in line with the applied methodology used in the project activity.<br/>CAR is closed.</li> <li>Revised MR now correctly includes the ex-ante emission reductions value as 81,853 tCO<sub>2</sub> per annum which is as per registered VCS-PD. Based on this value the estimated emission reductions during the current monitoring period comes out as 228,964 tCO<sub>2</sub>e however, the actual emission reductions for the same period are 152,155 tCO<sub>2</sub>e which are less than the estimated emission reductions as per registered VCS PD.<br/>CAR is closed</li> </ul> |
| <b>Conclusion</b><br><i>Tick the appropriate checkbox</i>                                                                                                                                 | <input type="checkbox"/> To be checked during the next periodic verification<br><input type="checkbox"/> Additional action should be taken (finding remains open)<br><input checked="" type="checkbox"/> The finding is closed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| Finding:                                                                                                              | CAR 5.2.3                                                                                                                                                                                                                                                                                        |
|-----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Classification</b>                                                                                                 | <input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR                                                                                                                                                                                                 |
| <b>Description of finding</b><br><i>Describe the finding in unambiguous style; address the context (e.g. section)</i> | <p>“Procedure for apportioning of electricity supplied to the grid where dates of monitoring period are not matching with dates of monthly electricity generation reports” is not explained in section 3.3 of the monitoring report which is valid for WTG in the current monitoring period.</p> |

| Finding:                                                                                                                                                                                  | CAR 5.2.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Corrective Action #1</b><br><i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>                                                    | In line to the registered VCS PD; “ <i>Procedure for apportioning of electricity supplied to the grid where dates of monitoring period are not matching with dates of monthly electricity generation reports</i> ”, is now given in appendix-IV a part of revised monitoring report. DOE is requested to refer the ER sheet, to verify the calculated values.                                                                                                                                                           |
| <b>DOE Assessment #1</b><br><i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.</i> | Appendix-IV (i.e. details of apportioning data) of the revised MR includes the site wise and year wise break up of apportioning data which is correct and in line with the apportioning values given in Emission Reduction sheet. Verification team has checked the calculation part of the apportioning done for the cases where start and end date of the monitoring period are not matching with the billing cycle and found that apportioning done for those months are correct and accurate.<br>CAR is closed now. |
| <b>Conclusion</b><br><i>Tick the appropriate checkbox</i>                                                                                                                                 | <input type="checkbox"/> To be checked during the next periodic verification<br><input type="checkbox"/> Additional action should be taken (finding remains open)<br><input checked="" type="checkbox"/> The finding is closed                                                                                                                                                                                                                                                                                          |

## Final Assessment

☒ The project is in line with the VCS requirements w.r.t this issue.

## 4.3 Quality of Evidence to Determine GHG Emission Reductions or Removals

The only key monitoring parameter with influence on the calculation of the emission reductions is the net power exported to the Grid. Meter reading is taken jointly by DISCOM(s)/Power Producer representatives i.e. Suzlon the O&M contractor appointed by the project participant. Based on joint meter reading taken by DISCOM and Suzlon monthly share of electricity certificate issued is issued by respective DISCOM's and net electricity supplied to the grid as per this certificate form the basis of emission reduction calculations. The grid emission factor 0.94865 tCO<sub>2</sub>e / MWh is taken from the registered VCS PD which has been fixed ex-ante for the calculation of emission reduction throughout the crediting period.

The reported values, notation, units and sources in the monitoring report<sup>/MR/</sup> for all the monitoring parameters have being cross checked with the emission reduction sheet and with monitoring report. During verification, the data is cross verified with the reading mentioned in the monitoring report<sup>/MR/</sup>, the procedure for data transfer and compilation was also verified and found in compliance with the requirement. Furthermore, the cross checks have been performed during site inspection on the continuous operation of the monitoring equipment and procedures.

All necessary monitoring instruments are installed. The details of the meters were verified on the basis of physical verification during the site visit. Further, all internal data are subjected to QA/QC measures. Suzlon Energy Limited (Suzlon) is the O&M contractor and is ISO 9001:2008 certified and has proper procedures for data handling which is cross checked by the verification team to ensure that the QA/QC procedure is followed as per the ISO standard.

The monitoring personnel at site are well trained and follow reproducible routines. The training records<sup>/TR/</sup> of the plant personals have been cross checked and found OK. Thus, they are competent to carry out the relevant tasks with sufficient accuracy. The net electricity exported to the grid by the project has been sourced from the monthly credit note/JMR<sup>/EGC/</sup>. The net electricity value has also been cross checked by the verification team with invoices<sup>/INV/</sup> raised and found OK.

The emission factor for the NEWNE grid to which the project activity exports power to is determined as 0.94865 tCO<sub>2</sub>e/MWh, a value fixed ex-ante during the validation of the project activity and sourced from the official source for grid emission factor in India ("CO<sub>2</sub> Baseline Database for Indian Power Sector" published by the Central Electricity Authority, Ministry of Power, Government of India, Sector, Version 07" available at [www.cea.nic.in](http://www.cea.nic.in)). Thus the process of determining the emission reduction is appropriate and correct.

No significant, lack of evidence and missing data were detected during on-site verification. It is evident from the monitoring data that the monitoring system ensures for continuous (except some routine breakdowns or outage)<sup>/BD/</sup> operation.

The values of the net electricity supplied to grid by project activity have also been cross checked with invoices<sup>/INV/</sup> raised by the PP on DISCOM and found correct. The calibration for the meters has been carried out at the once in five year which in line with the PDD. The metering equipment were inspected & tested by State Utility. The main and check meters are tested for accuracy once every year by state utility and in case of error; meters are calibrated by state utility. During the current monitoring period the Main and check meter at Akal, Osian, RKB (in Rajasthan) and Jaora in Madhya Pradesh substation were delayed during the current monitoring period. Therefore, for the said period for which delay in calibration of the energy meters an error factor @ 0.2% has been taken while calculating the net generation by the project activity for entire month of the monitoring period.

Further during the peridic meter testing, all the meters were under the permissible limit of error and accordingly none of the meter was replaced during the current monitoring period. The meters are assessed to be working in satisfactory condition. The calibration certificates<sup>/CAL/</sup> are reviewed by the verification team and found to be appropriate. The errors identified during calibration are found to be within maximum permissible error of the energy meters.

Meter details & calibration details for the all the main and check meters are as follows:-

| Meter Location      | Akal-F1 Grid Sub-station<br>(State Electricity Board) |                          | Akal-F2 Grid Sub-station<br>(State Electricity Board) |                          |
|---------------------|-------------------------------------------------------|--------------------------|-------------------------------------------------------|--------------------------|
| Type of meter       | Main Meter                                            | Check Meter              | Main Meter                                            | Check Meter              |
| Meter Sr. No.       | MSB 10293                                             | MSB 10292                | MSB 10307                                             | MSB 10309                |
| Meter Make          | Secure                                                | Secure                   | Secure                                                | Secure                   |
| Accuracy class      | 0.2 s                                                 | 0.2 s                    | 0.2 s                                                 | 0.2 s                    |
| Calibration Details | 12/03/2011<br>15/03/2012                              | 12/03/2011<br>15/03/2012 | 12/03/2011<br>15/03/2012                              | 12/03/2011<br>15/03/2012 |

| Meter Location      | Osian Grid Sub-station<br>(State Electricity Board) |             | RKB Grid Sub-station<br>(State Electricity Board) |             |
|---------------------|-----------------------------------------------------|-------------|---------------------------------------------------|-------------|
| Type of meter       | Main Meter                                          | Check Meter | Main Meter                                        | Check Meter |
| Meter Sr. No.       | RJB 74505                                           | RJB 74506   | RJB 00315                                         | RJB00324    |
| Meter Make          | Secure                                              | Secure      | Secure                                            | Secure      |
| Accuracy class      | 0.2 s                                               | 0.2 s       | 0.2 s                                             | 0.2 s       |
| Calibration Details | 20/03/2012                                          | 20/03/2012  | 19/03/2012                                        | 19/03/2012  |

| Meter Location      | Jaora-F1 Grid Sub-station<br>(State Electricity Board) |                                        | Jaora-F2 Grid Sub-station<br>(State Electricity Board) |             |
|---------------------|--------------------------------------------------------|----------------------------------------|--------------------------------------------------------|-------------|
| Type of meter       | Main Meter                                             | Check Meter                            | Main Meter                                             | Check Meter |
| Meter Sr. No.       | 34413                                                  | 34412                                  | 3475859                                                | 3475860     |
| Meter Make          | Secure                                                 | Secure                                 | Secure                                                 | Secure      |
| Accuracy class      | 0.2 s                                                  | 0.2 s                                  | 0.2 s                                                  | 0.2 s       |
| Calibration Details | 09/12/2009<br>18/07/2011<br>17/11/2012                 | 09/12/2009<br>18/07/2011<br>17/11/2012 | 17/11/2012                                             | 17/11/2012  |

| Meter Location      | Palsodi-F1 Sub-station<br>(MP Electricity Board) |                                        | Palsodi-F2 Sub-station<br>(MP Electricity Board) |                                        | Palsodi-F2 Sub-station<br>(MP Electricity Board) |                                        |
|---------------------|--------------------------------------------------|----------------------------------------|--------------------------------------------------|----------------------------------------|--------------------------------------------------|----------------------------------------|
| Type of meter       | Main Meter                                       | Check Meter                            | Main Meter                                       | Check Meter                            | Main Meter                                       | Check Meter                            |
| Meter Sr. No.       | <b>MPE15233</b>                                  | <b>MPE15232</b>                        | <b>MPE20352</b>                                  | <b>MPE20353</b>                        | MPE57983                                         | MPE57984                               |
| Meter Make          | Secure                                           | Secure                                 | Secure                                           | Secure                                 | Secure                                           | Secure                                 |
| Accuracy class      | 0.2 s                                            | 0.2 s                                  | 0.2 s                                            | 0.2 s                                  | 0.2 s                                            | 0.2 s                                  |
| Calibration Details | 20/02/2010<br>18/07/2011<br>04/06/2012           | 20/02/2010<br>18/07/2011<br>04/06/2012 | 20/02/2010<br>23/07/2011<br>04/06/2012           | 20/02/2010<br>23/07/2011<br>04/06/2012 | 19/03/2010<br>18/07/2011<br>04/06/2012           | 20/02/2010<br>23/07/2011<br>04/06/2012 |

During the course of VCS verification process findings were raised by verification team related to quality of evidence to determine GHG emission reductions or removals and closed successfully.

## Related Findings

- ☐ No CARs, CLs or FARs have been identified in this context
- ☒ The following finding(s) have been addressed:

| Finding:                                                                                                                                                                                  | CAR 5.3.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                             |                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------------------|
| Classification                                                                                                                                                                            | <input checked="" type="checkbox"/> CAR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <input type="checkbox"/> CL | <input type="checkbox"/> FAR |
| <b>Description of finding</b><br><i>Describe the finding in unambiguous style; address the context (e.g. section)</i>                                                                     | <p>Meter calibration details provided in appendix III of the monitoring report for energy meters installed at substations are not in line with the actual practice followed on-site like;</p> <ul style="list-style-type: none"> <li>For Akal substation MM/CM details is missing;</li> <li>For RKB substation site details of MM/CM is missing.</li> <li>Meter calibration date valid for the period from Jan-2010 to March 2011 is missing for some energy meters. Also, information on due date of meter calibration, meter type, accuracy class is missing.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                             |                              |
| <b>Corrective Action #1</b><br><i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>                                                    | <p>Calibration details provided in appendix III of the monitoring report for energy meters installed at substations now made consistent with the actual practice followed on-site like and revised corrected metering diagram;</p> <ul style="list-style-type: none"> <li>For Akal substation MM/CM details is now submitted</li> <li>For RKB site details of MM/CM is now submitted</li> <li>Due date of meter calibration, meter type, accuracy class is also provided now. Meter calibration date valid for Jan-2010 to March 2011 is now provided. Further, Correction factor to the maximum permissible limit is been applied to all the net energy generation where delay in calibration was observed.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                             |                              |
| <b>DOE Assessment #1</b><br><i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.</i> | <p>Metering arrangement/location of Main meter/check meter for WTGs located in Madhya Pradesh and Rajasthan are now correctly included in the revised Monitoring Report<sup>/MR/</sup> which is as per actual practice followed on-site. In line with the same meter calibration details are now correctly provided in appendix III of the monitoring report<sup>/MR/</sup> for energy meters connected to a substations and/or feeder i.e. Akal, RKB. Further, the calibration of energy meters installed at the substation used for the measurement has been submitted to verification team and also were verified by the verification team and found to be correct and appropriate. The errors recorded in the calibration certificates are verified to be within maximum permissible limit. Therefore, it is concluded by verification team that meters are working in safe condition during the current monitoring period.</p> <p>For energy meter connected to Akal, Osian, RKB (in Rajasthan) and Jaora feeder-2 (in Madhya Pradesh) substations calibration of the energy meters could not be carried out within due date of calibration for year 2010 and 2011 of the monitoring period. Therefore, for the delayed period error factors have been applied in the energy export and energy import values to get the net energy supplied to the grid. Error applied for the calculation of net electricity for emission reduction is in line with the CDM Validation and Verification Standard, Version 09.0. Verification team has verified all the calibration certificate<sup>/CAL/</sup> of the energy meters and results of the calibration to confirm that the error applied for the delayed period months is correct and appropriate. Therefore, it is concluded by verification team that</p> |                             |                              |

|                                                           |                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                           | <p>the emission reduction calculated for the current monitoring period are correct and conservative.</p> <p>Revised MR and ER sheet is verified by verification team to confirm that the error factor applied on electricity generation values for each months of the monitoring period is correct which leads to conservative estimation of emission reductions. CAR is closed</p> |
| <b>Conclusion</b><br><i>Tick the appropriate checkbox</i> | <input type="checkbox"/> To be checked during the next periodic verification<br><input type="checkbox"/> Additional action should be taken (finding remains open)<br><input checked="" type="checkbox"/> The finding is closed                                                                                                                                                      |

| Finding:                                                                                                                                                                                  | CAR 5.3.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------------------|
| <b>Classification</b>                                                                                                                                                                     | <input checked="" type="checkbox"/> CAR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <input type="checkbox"/> CL | <input type="checkbox"/> FAR |
| <b>Description of finding</b><br><i>Describe the finding in unambiguous style; address the context (e.g. section)</i>                                                                     | <ul style="list-style-type: none"> <li>Metering arrangement of WTG given in section 3.3 of the monitoring report is very generic considering the project is located in different states as verified during site visit.</li> <li>Since, the project is located in state Rajasthan and Madhya Pradesh it is logical to present the net electricity generated separately in section 3.2 of the monitoring report.</li> <li>Avoid use of words "will" "shall" in the monitoring report as MR includes information or practices which are already done during the monitoring period i.e. 26/02/2010 to 12/12/2012 verification.</li> </ul>          |                             |                              |
| <b>Corrective Action #1</b><br><i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>                                                    | <ul style="list-style-type: none"> <li>Metering arrangement of WTG given in section 3.3 of the monitoring report is in line to the register VCS PD.</li> <li>In section 3.2 of the MR, net energy values have been provided separately for Rajasthan and Madhya Pradesh.</li> <li>Use of words "will" "shall" is been removed from the monitoring period.</li> </ul>                                                                                                                                                                                                                                                                           |                             |                              |
| <b>DOE Assessment #1</b><br><i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and VT assessments (#2, #3, etc.) shall be added.</i> | <ul style="list-style-type: none"> <li>Onsite metering arrangement is now correctly included for WTGs located in Rajasthan and Madhya Pradesh state of India which is in line with the on-site metering arrangement. CAR is closed.</li> <li>In section 3.2 of the revised MR, net energy values are now provided separately for Rajasthan and Madhya Pradesh under monitoring parameter export, import and net value of electricity generated by project. CAR is closed.</li> <li>In various sections of the revised MR use of words "will" "shall" is now removed from the monitoring period by project proponent. CAR is closed.</li> </ul> |                             |                              |
| <b>Conclusion</b><br><i>Tick the appropriate checkbox</i>                                                                                                                                 | <input type="checkbox"/> To be checked during the next periodic verification<br><input type="checkbox"/> Additional action should be taken (finding remains open)<br><input checked="" type="checkbox"/> The finding is closed                                                                                                                                                                                                                                                                                                                                                                                                                 |                             |                              |

#### Final Assessment

☒ The project is in line with the VCS requirements w.r.t this issue.

## 4.4 Management and Operational System

### Description

Quality Management procedures for measurements, collection and compilation of data, data storage and archiving, calibration, maintenance and training of personnel in the framework of this project activity have been defined. The site visit confirmed that monitoring and reporting is carried out consistently and records are kept in a secure and consistent manner. The project activity is operated and managed by O&M contractor (personnel appointed by supplier of WTG). The data is achieved electronically and the retention time for keeping or records is defined in the PD as two years in addition to crediting period.

The O&M contractor i.e. Suzlon and the staff personnel of O&M contractor carries out activities for preventive maintenance and trouble free operation of the WTGs. The O&M service provider is responsible for security of the WTGs, data logging for power generation, grid availability, machine availability, preparation & necessary documentation to be presented at the time of monthly joint meter reading. They are also responsible for visual inspection of WTG & all parts thereof and technical assistance including checking of various technical, safety and operational parameters of the equipment, trouble shooting and relevant technical services.

### Related Findings

- ☒ No CARs, CLs or FARs have been identified in this context
- ☐ The following finding(s) have been addressed:

### Final Assessment

- ☒ The project is in line with the VCS requirements w.r.t this issue.

## 5 VERIFICATION CONCLUSION

M/s. Ruchi Soya Industries Limited has commissioned the TÜV NORD JI / CDM Certification Program to carry out the verification of the Project “44.40 MW Wind Energy Project by Ruchi Soya Industries Limited, India” with regard to the requirements of VCS 3.0 Standard.

The project is a renewable energy project. It has been implemented to produce electricity by using wind, a renewable source of energy. The project activity involves installation of the Wind Turbine Generators (WTGs) in different locations of Madhya Pradesh and Rajasthan with a total installed capacity of 44.40 MW with 44 number of WTGs with rated capacity of 600 kW each (model S-52) and 12 WTGs with rated capacity of 1500 kW each (model S-82).

The project activity will generate electrical energy utilising wind energy and supply the generated electricity to the regional NEWNE grid of India. The project activity results in avoidance of Green House Gases (GHGs) emission and contributes to mitigation of global warming.

### **Reporting period: 26/02/2010 to 12/12/2012 (Including both days)**

In the course of the verification 06 Corrective Action Requests (CARs) and one Clarification Requests (CLs) are raised. No Forward Action Request (FAR) is raised in this verification.

The verification is based on the monitoring report<sup>/MR/</sup>; the monitoring plan as set out in the validated VCS PD<sup>/VCS-PD/</sup>, the validation report<sup>/VAL/</sup>, emission reduction calculation spreadsheet<sup>/XLS/</sup>, VCS Project Document<sup>/VCS-PD/</sup> and other supporting documents like commissioning certificate<sup>/CC/</sup> breakdown records<sup>/BD/</sup>, Calibration certificate<sup>/CAL/</sup>, Invoices<sup>/INV/</sup> etc. made available to the TÜV NORD JI/CDM CP by the project participant.

In detail the conclusions can be summarised as follows:

- all operations of the project are implemented and installed as planned and described in the validated project description.
- the monitoring plan is in accordance with the applied approved CDM methodology “Consolidated baseline methodology for grid-connected electricity generation from renewable source”, ACM0002 version 12.1.0.
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated<sup>/CAL/</sup> once in a year as per the monitoring plan.
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of the VCS verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

| GHG Emission Reductions or Removals                               | tCO <sub>2</sub> e |          |          |
|-------------------------------------------------------------------|--------------------|----------|----------|
|                                                                   | 2010               | 2011     | 2012     |
| Year                                                              |                    |          |          |
| Baseline Emissions (tCO <sub>2</sub> e)                           | 30046.53           | 45911.13 | 77197.41 |
| Project Emissions (tCO <sub>2</sub> e)                            | 0                  | 0        | 0        |
| Leakage (tCO <sub>2</sub> e)                                      | 0                  | 0        | 0        |
| Net GHG emission reduction or removals (tCO <sub>2</sub> e)       | 30047 <sup>2</sup> | 45911    | 77197    |
| Total Net GHG emission reduction or removals (tCO <sub>2</sub> e) | 153,155            |          |          |

Vadodara, 12/08/2016

**Mr. Indrapal Parmar**

TÜV NORD JI/CDM Certification Program  
Verification Team Leader

Essen, 27/08/2016

**Mr. Evgeni Sud**

TÜV NORD JI/CDM Certification Program  
Final Approval

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<sup>2</sup> Rounddown value

## ANNEX 1 REFERENCES

**Table Annex 1.1:** Documents provided by the project participant

| Reference    | Document                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>/CAL/</b> | Calibration Certificates of the energy meters located at following locations/sites: <ol style="list-style-type: none"> <li>1. Calibration certificate dated 12/03/2011 and 15/03/2012 for Main &amp; check meter connected to Akal-1 and Akal-2 substation</li> <li>2. Calibration certificate dated 20/03/2012 for Main &amp; check meter connected to Osian substation</li> <li>3. Calibration certificate dated 19/03/2012 for Main &amp; check meter connected to RKB substation</li> <li>4. Calibration certificate dated 09/12/2009; 18/07/2011 &amp; 17/11/2012 for Main &amp; check meter connected to Feeder-1 of Jaora substation</li> <li>5. Calibration certificate dated 17/11/2012 for Main &amp; check meter connected to Feeder-2 of Jaora substation</li> <li>6. Calibration certificate dated 20/02/2010; 18/07/2011 &amp; 04/06/2012 for Main &amp; check meter connected to Feeder-1 of Palsodi substation</li> <li>7. Calibration certificate dated 20/02/2010; 23/07/2011 &amp; 04/06/2012 for Main &amp; check meter connected to Feeder-2 of Palsodi substation</li> <li>8. Calibration certificate dated 19/03/2010; 18/07/2011 &amp; 04/06/2012 for Main &amp; check meter connected to Feeder-3 of Palsodi substation</li> </ol> |
| <b>/CCI/</b> | Commissioning certificates received for individual WTGs of 44.40 MW project activity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>/BD/</b>  | Breakdown details of the project WTGs during the current monitoring period as part of Daily Generation Log (DGR) maintained by Suzlon                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>/DEC/</b> | Declaration from the project owner w.r.t claim of GHG removals from the project activity under other GHG programs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>/EGC/</b> | Monthly Electricity Generation Certificate or Joint Meter Reading (JMR) and/or Credit Note report issued by the Distribution Licensee of Rajasthan/Madhya Pradesh to client covering entire monitoring period, from 26/02/2010 to 12/12/2012.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>/INV/</b> | Copies of invoices for entire months of the current monitoring period i.e. from 26/02/2010 to 12/12/2012.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>/MR/</b>  | <ul style="list-style-type: none"> <li>• Monitoring Report of the project, “44.40 MW Wind Energy Project by Ruchi Soya Industries Limited, India”, version 1 dated 14/02/2014</li> <li>• Monitoring Report of the project, “44.40 MW Wind Energy Project by Ruchi Soya Industries Limited, India”, version 2 dated 12/08/2016.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Reference        | Document                                                                                                                                                                                                                                                                               |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>/DGR/</b>     | Daily Generation Report (DGR) of the WTGs included in the project activity for the current monitoring period i.e. from 26/02/2010 to 12/12/2012.                                                                                                                                       |
| <b>/PPA/</b>     | <ul style="list-style-type: none"> <li>Power Purchase Agreement (PPA) signed between the Ruchi Soya Industries Limited and Discom.</li> <li>Wheeling Agreement (WA) signed between the Ruchi Soya Industries Limited</li> </ul>                                                        |
| <b>/O&amp;M/</b> | Operation and Maintenance (O&M) contract signed between Ruchi Soya Industries Limited and Suzlon for 44.40 MW project activities.                                                                                                                                                      |
| <b>/TS/</b>      | Technical specification of the Suzlon make Wind Turbine installed in the 44.40 MW project activity                                                                                                                                                                                     |
| <b>/TR/</b>      | Training records of the operational and maintenance personnel maintained on-site.                                                                                                                                                                                                      |
| <b>/XLS/</b>     | <ul style="list-style-type: none"> <li>Emission reduction calculation spread sheet with respect to the monitoring report, version 1 dated 14/02/2014</li> <li>Emission reduction calculation spread sheet with respect to the monitoring report, version 2 dated 12/08/2016</li> </ul> |

**Table Annex 1.2:** Background investigation and assessment documents

| Reference          | Document                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>/ACM/</b>       | Consolidated baseline methodology for grid-connected electricity generation from renewable source", ACM0002 version 12.1.0                                                                                                                                                                                                                                                                                                                                                                     |
| <b>/CPM/</b>       | TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>/IPPC/</b>      | <ol style="list-style-type: none"> <li>1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book</li> <li>2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book</li> </ol>                                                                                                                                                                                                                                                                                     |
| <b>/ISO 14064/</b> | <p>Greenhouse gases – Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals</p> <p>Greenhouse gases – Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements</p> <p>Greenhouse gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions</p> |
| <b>/ISO14065/</b>  | Greenhouse gases – Requirements for greenhouse gas validation and verification                                                                                                                                                                                                                                                                                                                                                                                                                 |

| Reference  | Document                                                                                                                                                      |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
|            | bodies for use in accreditation or other forms of recognition                                                                                                 |
| /TS/       | Photographs of the equipment name plates taken at project site by the verification team as a proof of technical specification.                                |
| /VAL-R/    | VCS Validation report of the project titled “44.40 MW Wind Energy Project by Ruchi Soya Industries Limited, India” version dated 25/02/2012.                  |
| VCS        | Verified Carbon Standard 3                                                                                                                                    |
| /VCSPD/    | Validated VCS project description of the project, titled “44.40 MW Wind Energy Project by Ruchi Soya Industries Limited, India” version 2.0 dated 26/09/2011. |
| /VVS/      | UNFCCC Validation and Verification Standard (Version 9.0)                                                                                                     |
| /VDS-PD-T/ | VCS PD Template                                                                                                                                               |

**Table Annex 1.3:** Websites used

| Reference | Link                                                                     | Organisation      |
|-----------|--------------------------------------------------------------------------|-------------------|
| /IPCC/    | <a href="http://www.ipcc-nggip.iges.or.jp">www.ipcc-nggip.iges.or.jp</a> | IPCC publications |
| /VCS/     | <a href="http://www.v-c-s.org">www.v-c-s.org</a>                         | VCSA              |
| /UNFCCC/  | <a href="http://cdm.unfccc.int">http://cdm.unfccc.int</a>                | UNFCCC            |

**Table Annex 1.4:** List of interviewed persons

| Reference | Mol <sup>1</sup> |                                                                        | Name          | Organisation / Function                          |
|-----------|------------------|------------------------------------------------------------------------|---------------|--------------------------------------------------|
| /IM01/    | T, E             | <input checked="" type="checkbox"/> Mr.<br><input type="checkbox"/> Ms | Ashish Verma  | Ruchi Soya Industries Limited / Sr. Executive RE |
| /IM01/    | T,E,V            | <input checked="" type="checkbox"/> Mr.<br><input type="checkbox"/> Ms | Avdresh Dixit | Ruchi Soya Industries Limited                    |
| /IM01/    | V                | <input checked="" type="checkbox"/> Mr.<br><input type="checkbox"/> Ms | Yashwant      | Project Manager/ Suzlon (Substation)             |

| Reference | Moi <sup>1</sup> |                                                                        | Name                | Organisation / Function     |
|-----------|------------------|------------------------------------------------------------------------|---------------------|-----------------------------|
| /IM01/    | V                | <input checked="" type="checkbox"/> Mr.<br><input type="checkbox"/> Ms | Indrajeet Chanpawat | Sr. Engineer / Suzlon (O&M) |
| /IM01/    | V                | <input checked="" type="checkbox"/> Mr.<br><input type="checkbox"/> Ms | Babulal Choudhary   | Jr. Engineer / Suzlon (O&M) |
| /IM01/    | V                | <input checked="" type="checkbox"/> Mr.<br><input type="checkbox"/> Ms | Avinash Janged      | Engineer/ Suzlon (O&M)      |
| /IM01/    | V                | <input checked="" type="checkbox"/> Mr.<br><input type="checkbox"/> Ms | Ketan Jawale        | Engineer/ Suzlon (CMS)      |

<sup>1)</sup> Means of Interview: (Telephone, E-Mail, Visit)