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# VERIFICATION AND CERTIFICATION REPORT

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**Vaayu (India) Power Corporation Private  
Limited**

**Vaayu India Wind Power Project in  
Andhra Pradesh**

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**SGS Climate Change Programme**

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<b>Date of Issue:</b>	<b>Project Number:</b>
20/07/2012	CDM.VER1297.MP1
<b>Project Title:</b>	
Vaayu India Wind Power Project in Andhra Pradesh	
<b>Organisation:</b>	<b>Client:</b>
SGS United Kingdom Limited	Vaayu (India) Power Corporation Private Limited
<b>Publication of Monitoring Report:</b>	
<b>Monitoring Period:</b>	25/04/2011 to 25/03/2012
First Monitoring Version and Date:	Version 1 dated 21/11/2011( Initial published MR before extension in monitoring period) Version 1.0 dated – 12/04/2012 ( New MR provided to DOE due to extension in monitoring period)
Final Monitoring Version and Date:	Version 1.3 dated 13/07/2012
<b>Summary:</b>	
<p>SGS United Kingdom Ltd has performed the first periodic verification of the CDM project Vaayu India Wind Power Project in Andhra Pradesh, with UNFCCC reference number of 4677, registration date of 25/04/2011 and crediting period from 25/04/2011 to 25/03/2012. The verification includes confirming the implementation of the monitoring plan of the registered PDD version 04 dated 03/02/2011 and revised PDD version 05, dated 22/05/2012 and the application of the monitoring methodology as per ACM0002 version 11 dated 26/02/2010. A site visit was conducted to verify the data submitted in the monitoring report. SGS confirms the following has been reviewed:</p> <ul style="list-style-type: none"> <li>(a) The registered PDD version 04, revised PDD version 05, including the monitoring plan and the corresponding validation report;</li> <li>(b) Monitoring report;</li> <li>(c) The applied monitoring methodology;</li> <li>(d) Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board;</li> <li>(e) All information and references relevant to the project activity's resulting in emission reductions.</li> </ul> <p>The proposed project activity involves the installation and operation of Wind Energy Converter for renewable electricity generation. The total installed capacity of the project activity is 50.4 MW. Total 63 WECs of rated capacity 800 kW each involved in the project activity. The machines are Enercon E-53 make. The project will generate 98.367 GWh of electricity per year which shall be supplied to the state electricity utility thereby contributing to reducing the energy demand supply gap in the state of Andhra Pradesh.</p> <p>SGS confirms that the project is implemented in accordance with the registered PDD<sup>1.1/</sup> and revised PDD, version 05, dated – 22/05/2012<sup>1.2/</sup>. The monitoring system is in place and the emission reductions are calculated without material misstatements. Our opinion relates to the projects GHG emissions and the resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring and its associated documents. Based on the information seen and evaluated we confirm that the implementation of the project has resulted in 93,324 tCO<sub>2</sub>e emission reductions during period 25/04/2011 to 25/03/2012.</p>	
<b>Subject:</b>	
CDM Verification	
<b>Verification Team:</b>	
Nayan Jyoti Deka – Lead Assessor/ Expert TA 1.2 (Wind) Ajay Singh Thakur– AssessorLocal Assessor Rekibuddin Ahmed - Local Assessor	<input checked="" type="checkbox"/> No Distribution (without permission from the Client or responsible organisational unit)
<b>Technical Review:</b>	<input type="checkbox"/> Limited Distribution
Date: 21/07/2012 Name: Ravi Kant Soni	
<b>Authorised Signatory:</b>	<input type="checkbox"/> Unrestricted Distribution
Name: Siddharth Yadav Date: 13/08/2012	

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## Abbreviations

ACM	Approved Consolidated Methodology
CPDCAL	Central Power Distribution Company of Andhra Pradesh Limited
BEF	Baseline emission factor
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean development mechanism
CEA	Central Electricity Authority
CER	Certified Emission Reductions
CL	Clarification Request
CM	Combined Margin
CMP	Conference of parties serving as the meetings of parties to Kyoto Protocol
CO <sub>2</sub>	Carbon dioxide
CoP	Conference of parties
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EB	Executive Board
ER	Emission Reduction
FAR	Forward Action Request
GHGs	Green House Gases
GoI	Government of India
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
JMR	Joint meter reading
KW	Kilowatt
KWH	Kilowatt hour
MoEF	Ministry of Environment and Forest
MoP	Meeting of Parties
MP	Monitoring Plan
MR	Monitoring Report
MW	Megawatt
MWh	Megawatt hour
NCDMA	National Clean Development Mechanism Authority
OM	Operating Margin
O&M	Operation & Maintenance
PDD	Project design document
PLF	Plant Load Factor
PP	Project Proponent
PPA	Power Purchase Agreement
PS	Project Standard
QA/QC	Quality Assurance and Quality Control
RMP	Revision in Monitoring Plan
SGS	Société Générale de Surveillance (currently known as SGS S.A.)
tCO <sub>2</sub> e	Tonnes of carbon dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change
VIPCP	Vaayu (India) Power Corporation Private Limited
VVS	Validation & Verification Standard
WEC	Wind Energy Converter

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## 1. Introduction

### 1.1 Objective

SGS United Kingdom Ltd has been contracted by Vaayu (India) Power Corporation Private Limited (one of the project participants of the project) to perform an independent verification of its CDM project Vaayu (India) Power Corporation Private Limited.

CDM projects must undergo periodic audits and verification of emission reductions as the basis for issuance of Certified Emission Reductions (CERs).

The objectives of this verification exercise are, by review of objective evidence, to establish that:

- The emissions report conforms with the requirements of the monitoring plan in the registered PDD<sup>1.1/</sup>, PDD, version 05, dated – 22/05/2012<sup>1.2/</sup> and the approved methodology; and
- The data reported are complete and transparent.

### 1.2 Scope

The scope of the verification is the independent and objective review and ex post determination of the monitored reductions in GHG emission by the project activity. The verification is based on the validated and registered project design document and the monitoring report. The project is assessed against the requirements of the Kyoto Protocol, the CDM Modalities and Procedures and related rules and guidance.

SGS has, based on the recommendations in the Validation and Verification Standard, employed a risk-based approach in the verification, focusing on the identification of significant reporting risks and the reliability of project monitoring.

Due professional care has been exercised and ethical conduct has been followed by the assessment team during the verification process. The verification report is a fair presentation of the verification activity.

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

### 1.3 Project Activity and Period Covered

This engagement covers emissions and emission reductions from anthropogenic sources of greenhouse gases included within the project boundary of the following project and period.

Title of Project Activity:	Vaayu India Wind Power Project in Andhra Pradesh.
UNFCCC Registration Number:	4677
Monitoring Period Covered in this Report:	25/04/2011 to 25/03/2012
Project Participants:	Vaayu (India) Power Corporation Private Limited
Host Country:	India
Annex I Country:	N/A
Location of the Project Activity:	The project is spread across Petnikota, Tummalapenta, Itikyala, Abdullapuram, Chintalayapalli, Venkatampalli & Bhogasamudram villages in Kurnol district in Indian State of Andhra Pradesh

The proposed project activity involves the installation of WECs for electricity generation. The total installed capacity of the project activity is 50.4 MW. Total 63 WECs of rated capacity 800 kW involved in the project activity. The machines are Enercon E-53 make. The project will generate 98.367 GWh of electricity per year

which shall be supplied to the state electricity utility thereby contributing to reducing the energy demand supply gap in the state of Andhra Pradesh. The purpose of the project activity is to utilize renewable wind energy for generation of electricity. The project activity replaces anthropogenic emissions of greenhouse gases (GHG's) into the atmosphere, by displacing an equivalent amount of electricity generation through the operation of existing fuel mix in the grid comprising mainly fossil fuel based power plants and future capacity expansions connected to the grid.

## 2. Methodology

### 2.1 General Approach

SGS performs the verification work using a Periodic Verification Checklist prepared following the VVS. The Periodic Verification Checklist describes the verification approach and the sampling plan.

The checklist gives the assessment team a full understanding of:

- Activities associated with all the sources contributing to the project emissions and emission reductions, including leakage if relevant;
- Protocols used to estimate or measure GHG emissions from these sources;
- Collection and handling of data;
- Controls on the collection and handling of data;
- Means of verifying reported data; and
- Compilation of the monitoring report.

Using the Periodic Verification Checklist, SGS verified the implementation of the monitoring plan and the data presented in the Monitoring Report for the period in question. This involved a site visit and a desk review of the monitoring report. This verification report describes the findings of this assessment.

Only verification activities undertaken after the publication of the monitoring report on the UNFCCC CDM website were used as a basis for SGS to conclude our verification and submit a request for issuance of CERs to the Board.

### 2.2 Verification Team for this Assessment

A team of competency has been selected to perform the verification of the project.

Name	Role
Nayan Jyoti Deka	Lead Assessor/ Expert TA 1.2 (Wind)
Ajay Singh Thakur	Assessor/ Local Assessor
Rekibuddin Ahmed	Local Assessor

### 2.3 Means of Verification

#### 2.3.1 Review of Documentation

The validated PDD & revised PDD, the monitoring report submitted by the client and additional background documents related to the project performance were reviewed. A complete list of all documents reviewed is attached in section 8 of this report.



### 2.3.2 Site Visits

As part of the verification, the following on-site inspections have been performed

<b>Location:</b> Petnikota, Tummalapenta, Itikyala, Abdullapuram, Chintalayapalli, Venkatampalli & Bhogasamudram villages in Kurnol district in Indian State of Andhra Pradesh	
<b>1<sup>st</sup> site visit Date:</b> 13/12/2011 and <b>2<sup>nd</sup> site visit Date:</b> 15/05/2012	
<b>Coverage:</b>	<b>Source of Information / Persons Interviewed</b>
Management Approach and GHG commitment	Navneet Kumar (Deputy Manager- Enercon India)
Assessment of project boundary	Navneet Kumar (Deputy Manager- Enercon India) S Nagarjun Reddy ( Engineer-Enercon India) Hari Prasad K ( Sr. Manager- Enercon India)
Testing of the accuracy of monitoring equipment	Navneet Kumar (Deputy Manager- Enercon India) S Nagarjun Reddy ( Engineer-Enercon India) Hari Prasad K ( Sr. Manager- Enercon India)
CDM monitoring and quality assurance	Navneet Kumar (Deputy Manager- Enercon India)

### 2.4 Reporting of Findings

As an outcome of the verification process, the team can raise different types of findings.

In general, where insufficient or inaccurate information is available and clarification or new information is required the team shall raise a Clarification Request (CL) specifying what additional information is required.

Where a non-conformance arises the team shall raise a Corrective Action Request (CAR). A CAR is issued, where:

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

The verification process may be halted until this information has been made available to comply with the requirements of the CDM Executive Board. Failure to address a CL may result in a CAR. Information or clarifications provided as a result of a CL may also lead to a CAR.

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

Corrective Action Requests and Clarification Requests are raised in the Periodic Verification Checklist. The Project Developer is given the opportunity to “close” outstanding CARs and respond to CLs.

Forward Action Requests (FARs) may be raised during verification for actions where the monitoring and reporting require attention and/or adjustment for the next verification period, which are for the benefit of

future projects and future verification activities. These have no impact upon the completion of the verification activity.

All CARs, CLs and FARs for this verification period are included in this report.

## **2.5 Internal Quality Control**

Following the completion of the assessment process and a recommendation by the Assessment Team, all documentation will be forwarded to a Technical Review Team. The task of the Technical Review Team is to check that all procedures have been followed and all conclusions are justified. The Technical Reviewer will either accept or reject the recommendation made by the assessment team.

### **Technical Review Team**

<b>Name</b>	<b>Role</b>
Ravi Kant Soni	Technical Reviewer/ Technical Area expert-TA 1.2 ( Wind)

### 3. Verification Findings

#### 3.1 Project Implementation

The proposed project activity involves the installation of WECs for electricity generation. The total installed capacity of the project activity is 50.4 MW. Total 63 WECs of rated capacity 800 kW involved in the project activity. The machines are Enercon E-53 make. The project will generate 98.367 GWh of electricity per year which shall be supplied to the state electricity utility thereby contributing to reducing the energy demand supply gap in the state of Andhra Pradesh. The purpose of the project activity is to utilize renewable wind energy for generation of electricity.

The following has been checked to verify the applicability of the methodology to the project activity. The proposed project activity was registered with UNFCCC<sup>12/</sup> on 25<sup>th</sup> April 2011 (UN Ref: 4677) and the methodology ACM002<sup>3/</sup> version 11 applied to the project activity and the same was valid at the time of validation. The assessment team has again checked all the applicability criteria of the methodology ACM002<sup>3/</sup> version 11 with the project activity and found that capacity of the project activity and the baseline considered for the project activity are still same. There is no change observed in this verification period. Thus, methodology ACM002<sup>3/</sup> version 11 is applicable to the project activity.

First site visit was conducted by the assessment team to the project activity on 13/12/2011 for the monitoring period 25<sup>th</sup> April 2011 to 26<sup>th</sup> September 2011. In line with paragraph 78 of EB 41, the monitoring period was extended till 25/03/2012 against CAR#04 (please refer the discussion of CAR#04 under this section). Hence assessment team re-visited the site on 15/05/2012 to verify the project activity for changed monitoring period (from 25/04/2011 to 25/03/2012).

The actual design, installation and operation of the project activity have been checked and found in compliance with information provided in the registered PDD<sup>1/</sup> and the revised PDD<sup>1/</sup>. The monitoring parameters and the monitoring approach as mentioned in the registered PDD<sup>1/</sup> have been found to be consistent even during the second site visit also. The project is running successfully and the parameters are being monitored as per the monitoring plan. There are no other GHG sources found attributable to the project activity. During the site visit no changes were observed on physical or spatial configuration of the project as compared to the registered PDD<sup>1.1/</sup> and the revised PDD<sup>1.2/</sup>. Up to the end of this monitoring period, the project boundary has always been consistent with the validated and registered PDD<sup>1/</sup> and the revised PDD<sup>1/</sup>. The complete assessment requirements as per paragraph 217 (b) of the Validation and Verification Standard<sup>19/</sup>, version 2 have been covered during the second site visit for the project activity.

Project was implemented and equipment installed as described in the registered PDD<sup>1/</sup> Version 4, dated 03/02/2011 and revised PDD version 5 dated – 22/05/2012<sup>1/</sup>. The project activity is located at District Karnool of Andhra Pradesh State and involves 63 numbers of WECs with 800 kW rated capacity of each WEC for achieving the purpose of renewable power generation. The total capacity of the project activity is 50.4 MW. The commissioning dates<sup>10/</sup> of WECs are-

S N	Name	Village Name	District	Commissioning Date	Machine No	Location No
1	Vaayu (India) Power Corporation Private Limited (Phase-1)	Petnikota	Kurnool	02.08.2010	8572	74
2		Petnikota	Kurnool	02.08.2010	8568	73
3		Petnikota	Kurnool	02.08.2010	8566	72
4		Petnikota	Kurnool	02.08.2010	8574	71
5		Petnikota	Kurnool	02.08.2010	8579	70
6		Petnikota	Kurnool	02.08.2010	8581	69
7	Vaayu (India) Power Corporation Private Limited (Phase-2)	Thummalapenta	Kurnool	24.12.2010	8582	43
8		Thummalapenta	Kurnool	24.12.2010	8587	43A
9		Petnikota	Kurnool	25.09.2010	8593	61

10		Petnikota	Kurnool	25.09.2010	8594	86
11		Petnikota	Kurnool	25.09.2010	8595	85
12		Petnikota	Kurnool	04.05.2011	8828	90
13	Vaayu (India) Power Corporation Private Limited (Phase-3)	Petnikota	Kurnool	30.03.2011	9052	A1
14		Petnikota	Kurnool	30.03.2011	8777	A2
15		Petnikota	Kurnool	30.03.2011	8814	A4
16		Petnikota	Kurnool	30.03.2011	8810	A3
17		Petnikota	Kurnool	30.03.2011	8817	A5
18		Petnikota	Kurnool	04.05.2011	9047	A6
19	Vaayu (India) Power Corporation Private Limited (Phase-4)	Thummalapenta	Kurnool	07.02.2011	8608	28
20		Thummalapenta	Kurnool	28.09.2010	8609	27
21		Thummalapenta	Kurnool	28.09.2010	8610	26
22		Chintalayapalli	Kurnool	28.09.2010	8611	25
23		Chintalayapalli	Kurnool	28.09.2010	8613	24
24		Abudullapuram	Kurnool	28.09.2010	8633	17
25		Abudullapuram	Kurnool	28.09.2010	8630	16
26		Abudullapuram	Kurnool	28.09.2010	8627	15
27		Abudullapuram	Kurnool	28.09.2010	8625	14
28		Abudullapuram	Kurnool	12.11.2010	8638	13
29		Abudullapuram	Kurnool	12.11.2010	8637	12
30		Abudullapuram	Kurnool	12.11.2010	8605	11
31		Abudullapuram	Kurnool	12.11.2010	8599	10
32		Thummalapenta	Kurnool	24.12.2010	8607	29
33	Vaayu (India) Power Corporation Private Limited (Phase-5)	Chintalayapalli	Kurnool	30.09.2010	8614	30
34		Chintalayapalli	Kurnool	30.09.2010	8617	31
35		Chintalayapalli	Kurnool	30.09.2010	8618	32
36		Chintalayapalli	Kurnool	30.09.2010	8619	33
37		Chintalayapalli	Kurnool	30.09.2010	8620	35
38		Chintalayapalli	Kurnool	30.09.2010	8622	34
39	Vaayu (India) Power Corporation Private Limited (Phase-6)	Abudullapuram	Kurnool	02.12.2010	8604	9
40		Abudullapuram	Kurnool	02.12.2010	8603	8
41		Abudullapuram	Kurnool	02.12.2010	8602	7
42		Abudullapuram	Kurnool	02.12.2010	8601	6
43		Abudullapuram	Kurnool	02.12.2010	8600	5
44		Abudullapuram	Kurnool	02.12.2010	8941	4
45		Abudullapuram	Kurnool	02.12.2010	8597	3
46		Abudullapuram	Kurnool	02.12.2010	8596	2
47		Abudullapuram	Kurnool	02.12.2010	8589	1
48		Abudullapuram	Kurnool	02.12.2010	8831	23
49		Abudullapuram	Kurnool	02.12.2010	8639	22
50		Abudullapuram	Kurnool	02.12.2010	8830	21
51	Vaayu (India) Power Corporation Private Limited (Phase-7)	Venkatampalli	Anantapur	31.12.2010	9044	W6
52		Venkatampalli	Anantapur	31.12.2010	8775	W7

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53		Venkatampalli	Anantapur	31.12.2010	8980	W13
54		Venkatampalli	Anantapur	31.12.2010	8992	W12
55		Bhogasamudram	Anantapur	31.12.2010	9006	W8
56		Bhogasamudram	Anantapur	31.12.2010	8988	W9
57		Venkatampalli	Anantapur	31.12.2010	8773	W4
58		Venkatampalli	Anantapur	31.12.2010	8979	W5
59		Venkatampalli	Anantapur	24.01.2011	8811	W1
60		Venkatampalli	Anantapur	24.01.2011	8802	W2
61		Venkatampalli	Anantapur	24.01.2011	8803	W3
62		Bhogasamudram	Anantapur	24.01.2011	8986	W10
63		Bhogasamudram	Anantapur	24.01.2011	8987	W11

The present 1<sup>st</sup> periodic verification covers the monitored period starting from 25/04/2011 to 25/03/2012. The requirement for data recording as envisaged in the monitoring plan is duly incorporated and implemented in the project activity. Furthermore, there are no issues pending from the validation report<sup>2/</sup> of the project activity.

Event	Date
The project activity implemented and commissioned commercially (Commissioning dates of WTGs) <sup>10/</sup>	02/08/2010 to 04/05/2011
Project Registration <sup>12/</sup>	25/04/2011
Crediting period <sup>12/</sup>	25/04/2011 to 24/04/2021 (Fixed)
First Monitoring Period <sup>12/</sup>	25/04/2011 to 25/03/2012 (current- under verification)

The project boundary at site was assessed and it was found that the entire project activity was installed in 7 phase and the all the WECs involved in the project activity connected on the different 7 feeders. One main and one back up meter are connected to each feeder involved in the project activity. The calibration frequency of the meters was once in a year as per the registered PDD<sup>1/</sup>. However, the calibration frequency of the energy meters used in the project activity would not be as per the registered PDD<sup>1/</sup>. The calibration frequency would be once in a five year in the revised PDD<sup>1/</sup> as per national regulations on installation and operation of meters in accordance with section 18 subsection 1 (b), Calibration and periodical testing of meters by Central Electricity Authority (CEA) of India<sup>21/</sup> which is in accordance with the local/National standard (para 242 of the VVS). Thus, PP requested the revision in monitoring plan for the same and the assessment team has agreed for the same. The detail discussion on this issue mentioned in below section 3.2.

Initially the PP has considered the monitoring period from 25<sup>th</sup> April 2011 to 26<sup>th</sup> September 2011, which covers complete high wind seasonal variation (May to September) for the project site. Therefore, the difference in the total CERs is due to high plant load factor during the monitoring period. However, the PP requested to extend the monitoring period till 25<sup>th</sup> March 2012. In line with the guideline outlined in 41<sup>st</sup> meeting of executive board under paragraph 78, the monitoring period has been extended till 25/03/2012.

The PP has also provided the revised MR and the revised ER sheet with corrected dates. The estimated annual emission reductions in the registered PDD<sup>/1/</sup> for the current monitoring period are 85,584 tCO<sub>2</sub>e. The actual emission reductions are 93,324 which are more than the estimated emission reduction. There is around 18 % increment found in PLF for current monitoring period. Ex-ante PLF estimated 22.28 %, while PLF observed for current monitoring period is 24 %. However, it was assessed at the time of validation<sup>/2/</sup> that at 37.03 % PLF the equity IRR crosses the benchmark. Thus, the 18% increment doesn't any affect on additionality of the project activity as per the para 120 (e) of VVS.

#### Discussion of CARs/CLs

**CAR#01:** it was observed that from the commissioning certificates<sup>/10/</sup> that, the date of commissioning for Vaayu Phase 2 in the monitoring report<sup>/5/</sup> is inconsistent with the dates mentioned in the commissioning certificate<sup>/10/</sup>. Thus, CAR#01 was raised for the same. In response the PP has corrected the date of commissioning for Vaayu Phase 2 in revised MR; revised MR<sup>/5/</sup> version 1.1 dated 17.05.2012 has been cross checked with the commissioning certificates<sup>/10/</sup> and found correct. CAR#01 was closed successfully.

**CAR#02:** during the course of data verification it was observed that JMR<sup>/7/</sup> (Joint Meter Reading) statement of September 2011 (for Phase 1, 4 & 7) which mentions the electricity generation from 25/08/2011 to 25/09/2011, whereas the end date of the current MP was 26/09/2011. Considering this issue CAR#02 was raised. In response the PP clarified that The JMR<sup>/7/</sup> (Joint Meter Reading) statement for September 2011 (Phase 1, 4 & 7) records the electricity generation from 25/08/2011 to 25/09/2011 and the end date of the monitoring period shall be in line to the JMR<sup>/7/</sup>. However, during the later stage of verification the monitoring period was extended till 25/03/2012 in line with paragraph 78 of EB 41. Consequently the monitoring report and emission reduction sheet have been revised accordingly. It has been checked by with the JMRS<sup>/7/</sup> and found correct. Thus, CAR#02 was closed successfully

**CAR#04:** during the course of commencement of verification, it was observed that the quantum of CERs in the current monitoring period has been increased substantially (77%) as compared to the estimated CERs in the registered PDD<sup>/1/</sup>. In response the PP clarified that present monitoring period covers complete high wind seasonal variation (May to September) for the project site. Therefore, the difference in the total CERs is due to high plant load factor during the monitoring period. However, in order to demonstrate robustness of PLF, it is felt necessary that complete wind cycle for the project site should be captured. Hence, the PP requests DOE to consider extending the monitoring period till 25<sup>th</sup> March 2012 so that the robustness of PLF assumed in the PDD<sup>/1/</sup> is demonstrated transparently for a cycle including lean as well as peak wind season and in line with guideline outlined under paragraph 78 of EB 41, the extension in monitoring period dates was accepted by the assessment team. Accordingly the PP has provided the revised MR<sup>/5/</sup> and the revised ER sheet<sup>/4/</sup> with corrected dates. It has been checked by the assessment team and found that the estimated annual emission reductions in the registered PDD<sup>/1/</sup> for the changed monitoring period are 85,584 tCO<sub>2</sub>e. The actual emission reductions are 93,324 which are more than the estimated emission reduction. There is change of 9.04 % (upside) in the expected and annual emission reductions. It is noteworthy that Wind power generation in India is characterized by seasonal variation (peak, off peak and lean wind season) and yearly variation (with the difference of good-wind year, average year, and poor-wind year). The reason for more CERs is high PLF in high wind season of year during the monitoring period which is also covered under the sensitivity analysis done in the registered PDD. There is around 18% increment found in PLF for current monitoring period. Ex-ante PLF estimated 22.28%, while PLF observed for current monitoring period is 24%. However, it was assessed at the time of validation<sup>/2/</sup> that at 37.03% the equity IRR crosses the benchmark. Thus, assessment team has found that the increase in the PLF for the current monitoring period is reasonable. Thus, CAR#04 was closed successfully.

**CAR#10:** during the course of verification some editorial mistakes were found, as mentioned below

- Reference of the national standard used to change the calibration frequency not mentioned in section B.2.3 of the MR.
- The link for the project standard mentioned in section B.2.3 of MR is not working
- Description of the parameters EG<sub>pe</sub> & EG<sub>pi</sub> is not mentioned under section C of the MR
- Value of EG<sub>e</sub> mentioned under section D.2 of the MR is not consistent with the ER sheet



- Reference of section/document where monthly values of  $L_{ep}$  reported is not mentioned under section D.2 of MR

- The calculation mentioned under section E.5 of the MR is not correct

In response revised the monitoring report accordingly. It has been checked by the assessment team and found that

- Reference of the national standard which allows the calibration frequency 5 years has been included as footer 1 in the revised MR Version 1.3. it has been checked by the assessment team and found correct.
- The web link for the project standard mentioned has been revised under section B.2.3 of revised MR. it has been checked and found working.
- Description of the parameters EGpe & EGpi has been included under section C of the MR. it has been checked and found in line with the registered monitoring plan.
- Value of EGe mentioned under section D.2 of the MR has been revised. It has been checked by the assessment team and found consistent throughout the documentation.
- The calculation for the  $L_{ep}$  is described under section C of the monitoring report. The monthly values of  $L_{ep}$  have been provided as appendix 4 of the monitoring report. Same reference has been mentioned under section D.2 of the revised MR version 1.3. The values of  $L_{ep}$  are directly sourced from the JMR.
- The calculations provided in section E.5 of the MR has been revised for 336 days (Current monitoring period. It has been checked by the assessment team and found correct.

All the issues have been addressed properly in the revised MR. Thus, CAR#10 was closed.

The review of the revised monitoring report and on site assessment by the assessment team confirms that the project implementation is in accordance with the registered project design document, version 4, dated 03/02/2011<sup>1.1/</sup>, and revised PDD version 05 dated 22/05/2012<sup>1.2/</sup> and the project implementation requirements are in line with the paragraph 226- paragraph 227 of VVS, Version 02<sup>19/</sup>.

### 3.2 Post registration changes

The proposed project activity is implemented as per the registered PDD<sup>1/</sup>. However, revision in monitoring plan proposed by the PP that the calibration frequency of the energy meters used in the project activity would not be as per the registered PDD<sup>1/</sup>, since the meters are not under the control of the PP and the calibration/ testing are done by the State Electricity Board. Although the PPA mentions that annual calibration would be carried out, however, this procedure is not exactly being followed by state electricity board. Calibration of energy meters is solely under the control of the State Electricity Board officials and the PP do not have any control on it. The monitoring plan in the registered PDD specified that energy meters would be calibrated on annual basis. This was in line with the Power Purchase Agreements signed between the PP and state electricity Board (power off-takers). Even though the PPA signed by State Electricity Board specifies annual calibrations, however, in the actual practice, the government officials conduct the calibration as per their convenience/ requirement and which is beyond annual basis. Since calibration procedure is under the scope of State Electricity Board and not the project promoter, the original monitoring plan cannot be followed and thus, the calibration frequency has been changed to once in a five year. So, the calibration frequency for the project activity would be once in a five year which is as per national regulations on installation and operation of meters in accordance with section 18 subsection 1 (b), Calibration and periodical testing of meters by Central Electricity Authority (CEA)<sup>21/</sup> of India. The applied methodology ACM0002 version 11 does not specify any specific time period for conducting the calibration/testing of the equipment. Further as per national regulations on installation and operation of meters in accordance with section 18 subsection 1 (b), Calibration and periodical testing of meters by Central Electricity Authority (CEA)<sup>3/</sup> of India; the energy meters shall be calibrated and tested once in five year. The assessment team has checked the CEA metering regulations<sup>3/</sup>. [section 18 subsection 1 (b)] and found that it is accordance with the local/National standard (para 242 of the VVS)<sup>19/</sup>. It has to be noted that, maintaining the accuracy of energy meters is in the interest of both the power off-takers and the PP. Since the power off-takers make payments to the PP based on energy meter readings, and since once in a five year calibration of energy meters is acceptable

to the power off-takers, it is understood that the accuracy of the energy meter readings is not compromised in any way by changing the frequency from annual to once in a five year. It may also be noted that the energy meters are regularly checked by both the PP and the power off-takers. Furthermore, every metering point consists of both a main meter and a check meter. It is noteworthy that the proposed post registration changes does not require prior approval as per EB 65, annex 5 (clean development mechanism project standard, version 1.0), page 40, Appendix 1 "Changes that do not require prior approval by board", para 5 (a). the PP has submitted the revised PDD<sup>1/</sup> for the change in the calibration frequency from annual to once in a five year, which has been checked and found to be acceptable.

### Discussion of CARs/CLs

**CAR#07:** As per the para 5 (a) of Appendix 1 of the Project Standard (EB 65 Annex 5)<sup>20/</sup>, the prior approval is not required for the change of calibration frequency for monitoring equipment which is not under control of the PP. Thus, RMP and request for issuance shall be submitted simultaneously. The PP was requested to provide the revised monitoring report in the latest template available as per the VVS Track. In response the PP has revised the monitoring report in accordance with the latest template available in VVS Track. It has been checked by the assessment team and found that all the requirements of the template mentioned in the revised MR<sup>5/</sup> Version 1.2. Thus, CAR#07 was closed successfully

**CAR#08:** the PP was requested to clarify, how the calibration and testing is not possible at the frequency prescribed in the registered PDD. In response the PP has provided the detailed explanation with the supporting documents and assessment team observed that the PP doesn't have authority to conduct or appoint the third party for calibration/testing of the energy meters and therefore have to rely on the state utility for conducting calibration/testing of the energy meters. Thus, it is found that the calibration and testing of the meters are not under control of the PP and methodology also doesn't specify the calibration frequency. Consequently section 18 subsection 1 (b), Calibration and periodical testing of meters by Central Electricity Authority (CEA) of India has followed by the PP which recommends that the energy meters shall be calibrated and tested once in five year. It is also in line with the para 242 of the VVS. Thus, CAR#08 was closed.

**CAR#09:** the PP was requested to clarify, in cases where the meters used in the project activity would not work properly and if it will go beyond the maximum permissible error as prescribed in the registered PDD<sup>1/</sup>, then how the emission reductions would be calculated. Also, the PP was requested to clarify why the version and date of the revised PDD<sup>1/</sup> is not updated. In response the PP has clarified, in case the main meter is found to operate outside the permissible limits of error but the check meter is found to be within the permissible limits of error, the main meter will be either replaced or calibrated immediately and the consumption recorded by the Check meter will be referred for calculation of emission reductions. If both the main meter and check meter are found to operate outside the permissible limits of error, both the meters shall be either replaced or calibrated immediately and consumption recorded by the main meter after applying full value of maximum permissible error will be referred for calculation of emission reductions. Further, the version and date of the PDD has been revised with all necessary changes, the revised PDD<sup>1/</sup> version 05 dated 22/05/2012 is checked by the assessment team and found that the calculation for the delayed calibration would be applied as per the EB 52 Annex 60. Thus, CAR#09 was closed successfully.

The review of the revised monitoring report and on site assessment by the assessment team confirms that the project implementation is in accordance with the registered project design document, version 4, dated 03/02/2011<sup>1.2/</sup>, revised PDD version 05 dated 22/05/2012<sup>1.2/</sup> and all the requirements followed as per the Appendix 1 of the Project Standard<sup>20/</sup> paragraph 242- paragraph 248 of VVS, Version 02<sup>19/</sup>.

### 3.2.1 Temporary deviations from registered monitoring plan or applied methodology

The proposed project activity implemented as per the registered PDD and the revised PDD<sup>1/</sup> and monitoring is being carried out as per the registered monitoring plan and methodology ACM0002 version 11. Same is checked by the assessment team and there is no temporary deviations observed during the course of verification. Also checked with the VVS<sup>19/</sup> 248 and Appendix 1 of the project standard.<sup>20/</sup>



### **3.2.2 Corrections**

The proposed project activity implemented as per the registered PDD<sup>/1/</sup> and revised PDD<sup>/1/</sup>). Same is checked by the assessment team and VVS<sup>/19/</sup> 248 and Appendix 1<sup>/20/</sup> of the project standard.

### **3.2.3 Permanent changes from registered monitoring plan or applied methodology**

The proposed project activity has been implemented as per the registered PDD<sup>/1/</sup> and the monitoring being carried out as per the registered monitoring plan. However, the PP requested RMP regarding the change in calibration frequency of the energy meters involved in the project activity. The PP clarified that calibration/testing of meters cannot be conducted solely by the project proponent as per provisions of the power purchase agreement (PPA)<sup>/16/</sup>. As per article 4 of the PPA<sup>/16/</sup>, the energy meters shall be jointly inspected and sealed on behalf of both parties (state utilities and the PP) and shall not be interfered with, except in the presence of representatives of both the parties. Further as per article 4 of the PPA<sup>/16/</sup>, the PP is not provided with the authority to conduct or appoint the third party for calibration/testing of the energy meters and therefore have to rely on the state utility for conducting calibration/testing of the energy meters. Thus, it is found that the calibration and testing of the meters are not under control of the PP. Even though the PPA signed by State Electricity Board specifies annual calibrations, however, in the actual practice, the government officials conduct the calibration as per their convenience/ requirement and which is beyond annual basis. Since calibration procedure is under the scope of State Electricity Board and not the project promoter, the original monitoring plan cannot be followed and thus, the calibration frequency has been changed to once in a five year. Additionally, the applied methodology ACM0002<sup>/3/</sup> version 11 does not specify any specific time period for conducting the calibration/testing of the equipment. Further as per national regulations on installation and operation of meters in accordance with section 18 subsection 1 (b), Calibration and periodical testing of meters by Central Electricity Authority (CEA)<sup>/21/</sup> of India; the energy meters shall be calibrated and tested once in five year. The assessment team has checked the PPA<sup>/16/</sup>, methodology and CEA<sup>/21/</sup> metering regulations. [section 18 subsection 1 (b)] and found that it is accordance with the local/National standard (para 242 of the VVS)<sup>/19/</sup>. It is noteworthy that the proposed post registration changes does not require prior approval as per EB 65, annex 5 (clean development mechanism project standard, version 1.0), page 40, Appendix 1 "Changes that do not require prior approval by board", para 5 (a). the PP has submitted the revised PDD<sup>/1/</sup> for the change in the calibration frequency from annual to once in a five year, which has been checked for the permanent changes from the registered monitoring plan and found to be acceptable.

### **3.2.4 Changes to project design of registered project activity**

The proposed project activity implemented as per the registered PDD<sup>/1/</sup> and the revised PDD<sup>/1/</sup> and monitoring is being carried out as per the registered monitoring plan and methodology ACM0002<sup>/3/</sup> version 11. Same is checked by the assessment team and there is no change to project design of registered project activity observed during the course of verification. Also checked with the VVS paragraph 248<sup>/19/</sup> and Appendix 1<sup>/20/</sup> of the project standard.

### **3.2.5 Changes to start date of crediting period**

The proposed project activity was registered with UNFCCC<sup>/12/</sup> on the 25th April 2011 and the UN ref is 4677. The crediting period starts from the date of registration. It has been checked by the assessment team with UNFCCC web page<sup>/12/</sup> and confirms that there are no changes to start date of crediting period.

### **3.3 Remaining Issues, CAR's, FAR's from Previous Validation or Verification**

No pending issues observed in the validation<sup>/2/</sup>. The validation report of the project activity was checked as per the VVS Paragraph 224<sup>/19/</sup>.

### **3.4 Compliance of the monitoring plan with the monitoring methodology.**

The monitoring plan of the registered project is in accordance with the applied methodology ACM0002<sup>/3/</sup>, version 11. The purpose of the monitoring plan is to measure the net electricity supplied to the grid by the project activity, on the basis of which emission reductions are calculated. The source of the monitored data will be JMR<sup>/7/</sup> issued by state electricity board indicating the net electricity generation (or in other words the net electricity supplied to the grid) by the WECS.

The parameters monitored included net electricity supplied to the grid by the project activity (**EG<sub>PJ,y</sub>**), Electricity exported by project activity to grid after apportioning of transmission losses between 33kV metering point (Cluster meter) & 132kV metering point (Bulk metering point) (**EG<sub>Export,y</sub>**), Electricity Export recorded at 33kV (JMR at 33kV metering point) cluster metering points connecting total 63 machines of the project activity (**EG<sub>pe</sub>**), Electricity Import recorded at 33kV (JMR at 33kV metering point) cluster metering points connecting total 63 machines of the project activity (**EG<sub>pi</sub>**), Electricity Export recorded at

132 kV meters (main and check) at ENERCON pooling substation connecting machines of the project activity and machines commissioned by the other project developers (**EGe**) and total percentage of transmission loss for export between the metering point at 33 kV metering points (sum of all the WECs connected to Bulk metering point including non-project activity as well as project activity WECs) and the metering point at 132 kV at the ENERCON pooling substation (**Lep**).

The QA/QC procedures stipulated in the registered PDD<sup>/1/</sup> and the revised PDD<sup>/1/</sup> are followed during the monitoring period. Thus the monitoring plan and monitoring report is in line with the requirement of the applied Methodology. The monitoring of the project has been carried out in accordance with the methodology ACM0002,<sup>/3/</sup> Version 11 and the registered PDD<sup>/1/</sup> and the revised PDD<sup>/1/</sup>.

Registered PDD Approved Methodology	Requirement in the applicable methodology relevant documents	Requirement in the registered monitoring plan	Conclusion on the compliance of the monitoring plan in the PDD with the methodology
<b>Data/Parameter</b>	EGfacility,y	<b>EG<sub>PJ,y</sub></b>	Complies with the methodology
<b>Description</b>	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y	Net electricity supplied to the grid by the Project activity	Complies with the methodology
<b>Measured/Calculated /Default</b>	Measured	Calculated	Actual Practice as per the PPA
<b>Source of data</b>	Project activity site	Net electricity supplied to the grid by the Project activity calculated using the formula described in Section C of MR	Actual Practice as per the PPA
<b>Monitoring equipment</b>	Electricity meters	Calculated as per formulas better described under section C of MR	Actual Practice as per the PPA
<b>Measuring/Reading/ Recording frequency</b>	Continuous measurement and at least monthly recording	Monthly: The apportioning is done as per the procedure described in section C of MR	Actual Practice as per the PPA
<b>Calculation method (if applicable)</b>	Not Specified	Calculated using formula <b>EG<sub>PJ,y</sub> = EG<sub>export,y</sub> - EG<sub>pi</sub></b> Refer section C for details and description of the above variables.	Actual Practice as per the PPA
<b>QA/QC procedures</b>	Cross check	QA/QC procedures	Actual Practice as per

	measurement results with records for sold electricity	have been implemented by Discom/State utility pursuant to the provisions of the power purchase agreement except or otherwise explicitly stated in the PDD. Value of $EG_{P,J,y}$ can be crosschecked from certified statement given by state utility showing cost of export and import.	the PPA
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Registered PDD Approved Methodology	Requirement in the applicable methodology relevant documents and EB	Requirement in the registered monitoring plan	Conclusion on the compliance of the monitoring plan in the PDD with the methodology
<b>Data/Parameter</b>	Not specified	$EG_{Export,y}$	Methodology doesn't specify
<b>Description</b>	Not specified	Electricity exported by project activity to grid after apportioning of transmission losses between 33kV metering point (Cluster meter) & 132kV metering point (Bulk metering point)	Actual Practice as per the PPA
<b>Measured/Calculated /Default</b>	Not specified	Calculated	Actual Practice as per the PPA
<b>Source of data</b>	Not specified	Electricity exported by project activity calculated using the formula described in Section C of MR.	Actual Practice as per the PPA
<b>Monitoring equipment</b>	Not specified	Calculated as per formulas better described under section C of MR	Actual Practice as per the PPA
<b>Measuring/Reading/ Recording frequency</b>	Continuous measurement and at least monthly recording	Monthly: The apportioning is done as per the procedure described in section C.	Complies with the methodology
<b>Calculation method (if applicable)</b>	Not Specified	Calculated using formulae $EG_{export,y} = EG_{pe} * (1 - Lep (\%))$	Methodology doesn't specify

		Refer section C for details and description of the above variables.	
<b>QA/QC procedures</b>	Cross check measurement results with records for sold electricity	<p>Value of <math>EG_{\text{export, y}}</math> can be crosschecked from certified statement given by state utility showing cost of export and import. It may be noted that energy export by the project activity will be import by the grid from the project activity and therefore electricity export by the project activity is denoted as import by the grid in the certified statement by the state utility.</p> <p>QA/QC procedures have been implemented by Discom/State utility pursuant to the provisions of the power purchase agreement except or otherwise explicitly stated in the PDD.</p>	Complies with the methodology

Registered PDD Approved Methodology	Requirement in the applicable methodology relevant documents and EB	Requirement in the registered monitoring plan	Conclusion on the compliance of the monitoring plan in the PDD with the methodology
<b>Data/Parameter</b>	Not specified	<b>EG<sub>pe</sub></b>	Methodology doesn't specify
<b>Description</b>	Not specified	Electricity Export recorded at 33kV (JMR at 33kV metering point) cluster metering points connecting total 63 machines of the project activity.	Methodology doesn't specify
<b>Measured/Calculated /Default</b>	Measured	Measured	Complies with the methodology
<b>Source of data</b>	Project activity site	Electricity export to the grid as per the joint meter reading recorded at cluster metering	Complies with the methodology

		points.	
<b>Monitoring equipment</b>	Energy Meter	Energy Meter	Complies with the methodology
<b>Measuring/Reading/Recording frequency</b>	Continuous measurement and at least monthly recording	Measuring frequency: Continuous Recording frequency: Monthly	Complies with the methodology
<b>Calculation method (if applicable)</b>	Not specified	Not Applicable	Complies with the methodology
<b>QA/QC procedures</b>	Cross check measurement results with records for sold electricity	Value of <b>EGpe</b> can be cross checked from transmission loss calculation sheet signed by the representatives of Enercon and Discom.  The meters will be calibrated once in five years by the state utility. Refer Section C for an illustration of the provisions for QA/QC procedures	Complies with the methodology

Registered PDD Approved Methodology	Requirement in the applicable methodology relevant documents and EB	Requirement in the registered monitoring plan	Conclusion on the compliance of the monitoring plan in the PDD with the methodology
<b>Data/Parameter</b>	Not specified	<b>EGpi</b>	Methodology doesn't specify
<b>Description</b>	Not specified	Electricity Import recorded at 33kV (JMR at 33kV metering point) cluster metering points connecting total 63 machines of the project activity.	Methodology doesn't specify
<b>Measured/Calculated/Default</b>	Measured	Measured	Complies with the methodology
<b>Source of data</b>	Project activity site	Electricity import from the grid as per the joint meter reading recorded at cluster metering point.	Complies with the methodology
<b>Monitoring equipment</b>	Energy Meter	Energy Meter	Complies with the methodology

<b>Measuring/Reading/Recording frequency</b>	Continuous measurement and at least monthly recording	Measuring frequency: Continuous Recording frequency: Monthly	Complies with the methodology
<b>Calculation method (if applicable)</b>	Not specified	Not Applicable	Complies with the methodology
<b>QA/QC procedures</b>	Cross check measurement results with records for sold electricity	Value of EGpi can be crosschecked from certified statement given by state utility showing cost of export and import. It may be noted that energy import by the project activity will be export by the grid to the project activity and therefore electricity import by the project activity is denoted as export by the grid in the certified statement by the state utility.  The meters will be calibrated once in five years by the state utility. Refer Section C for an illustration of the provisions for QA/QC procedures.	Complies with the methodology

Registered PDD Approved Methodology	Requirement in the applicable methodology relevant documents and EB	Requirement in the registered monitoring plan	Conclusion on the compliance of the monitoring plan in the PDD with the methodology
<b>Data/Parameter</b>	Not specified	<b>EGe</b>	Methodology doesn't specify
<b>Description</b>	Not specified	Electricity Export recorded at 132 kV meters (main and check) at ENERCON pooling substation connecting machines of the project activity and machines commissioned by the other project developers	Methodology doesn't specify
<b>Measured/Calculated/Default</b>	Not specified	Measured	Methodology doesn't specify

<b>Source of data</b>	Not specified	Electricity export to the grid as per the joint meter reading recorded at 132 KV of the ENERCON pooling substation (Bulk metering point).	Methodology doesn't specify
<b>Monitoring equipment</b>	Energy Meter	Energy Meter	Complies with the methodology
<b>Measuring/Reading/Recording frequency</b>	Continuous measurement and at least monthly recording	Measuring frequency: Continuous Recording frequency: Monthly	Complies with the methodology
<b>Calculation method (if applicable)</b>	Not specified	Not Applicable	Complies with the methodology
<b>QA/QC procedures</b>	Cross check measurement results with records for sold electricity	Value of EGe can be cross checked from transmission loss calculation sheet signed by the representatives of Enercon and Discom.  The meters will be calibrated once in five years by the state utility. Refer Section C for an illustration of the provisions for QA/QC procedures.	Complies with the methodology

Registered PDD Approved Methodology	Requirement in the applicable methodology relevant documents and EB	Requirement in the registered monitoring plan	Conclusion on the compliance of the monitoring plan in the PDD with the methodology
<b>Data/Parameter</b>	Not specified	<b>Lep</b>	Actual Practice as per the PPA
<b>Description</b>	Not specified	Total percentage of Transmission loss for export between the metering point at 33 kV metering points (sum of all the WECs connected to Bulk metering point including non-project activity as well as project activity WECs) and the metering point at 132 kV	Actual Practice as per the PPA



		at the ENERCON pooling substation.	
<b>Measured/Calculated/Default</b>	Not specified	Calculated as per formulas better described under section C of MR	Actual Practice as per the PPA
<b>Source of data</b>	Not specified	Transmission Loss will directly applied from the joint meter reading for the project activity.	Actual Practice as per the PPA
<b>Monitoring equipment</b>	Not specified	Not Applicable	Actual Practice as per the PPA
<b>Measuring/Reading/Recording frequency</b>	Not specified	Monthly. Calculations are based on procedure described in section C.	Actual Practice as per the PPA
<b>Calculation method (if applicable)</b>	Not specified	<p>Total % of transmission losses for export ( Lep ) are calculated as per following formula:</p> $\text{Lep (\%)} = \frac{\{(X_{\text{Export},1} + X_{\text{Export},2} + X_{\text{Export},3} + \dots + X_{\text{Export},N}) - E_{\text{Ge}}\}}{X_{\text{Export},1} + X_{\text{Export},2} + X_{\text{Export},3} + \dots + X_{\text{Export},N}} \times 100$ <p>Refer section C for details and description of the above variables.</p>	Actual Practice as per the PPA
<b>QA/QC procedures</b>	Not specified	The value is calculated. Please refer Section C for QA/QC procedures.	Methodology doesn't specify

Total 6 monitoring parameters are included in the monitoring plan. All the parameters were included at the time of project validation. The net electricity supplied to the grid is calculated parameter. The registered PDD<sup>/1/</sup> has been checked with the methodology ACM0002<sup>/3/</sup> version 11 and found that all the parameters included in the monitoring plan comply with the methodology. All the information checked as per the requirement of 225 to 236 of the VVS<sup>/19/</sup>.

### 3.5 Completeness and accuracy of Monitoring

#### 3.5.1 Verification of monitoring of parameters

Monitoring of reductions in GHG emissions to result from the registered project have been implemented in accordance with the monitoring plan contained in the registered PDD<sup>1/</sup> and the revised PDD<sup>1/</sup>. The monitoring mechanism, including the data collection system, is effective and reliable. The monitoring of the project activity is found to be in conformity with monitoring methodology described in ACM0002<sup>3/</sup>, version 11. The required monitoring systems have been installed and operational. The meters comply with appropriate quality standards applicable for the used technology. The final verified values of all monitoring parameters are reported in section 04 of this report.

**Net electricity supplied to the grid by the Project activity ( $EG_{PJ,y}$ ):** The net electricity supplied to the grid by the project activity is calculated value. The entire project activity was installed in 7 phase and the all the WECs involved in the project activity connected on the different 7 feeders. One main and one back up meter are connected to each feeder involved in the project activity. The net electricity supplied to the grid is the difference of the Electricity exported by project activity to grid after apportioning of transmission losses between 33kV metering point (Cluster meter) & 132kV metering point (Bulk metering point) ( $EG_{Export,y}$ ) (Calculated value) and Electricity Import recorded at 33kV (JMR<sup>7/</sup> at 33kV metering point) cluster metering points connecting total 63 machines of the project activity ( $EG_{pi}$ ) (Calculated Value). Same has been discussed with the person responsible for the monitoring and found in line with the procedure mentioned in PPA<sup>16/</sup>.

**Electricity exported by project activity to grid after apportioning of transmission losses between 33kV metering point (Cluster meter) & 132kV metering point (Bulk metering point) ( $EG_{Export,y}$ ):** This is parameter is product of the Electricity Export recorded at 33kV (JMR<sup>7/</sup> at 33kV metering point) cluster metering points connecting total 63 machines of the project activity and ( 1- Lep (%)). It has been discussed with the person responsible for monitoring and found in line with the procedure mentioned in PPA<sup>16/</sup>. The values have been also crosschecked with the certified statement given by state utility showing cost of export and import.

**Electricity Export recorded at 33kV (JMR at 33kV metering point) cluster metering points connecting total 63 machines of the project activity ( $EG_{pe}$ ):** This is a measured value taken at the electricity meter at 33kV level on site for all the 7 feeders involved in the project activity. This reading is taken every month by the representatives of Enercon and the state utility jointly and the same can be checked from the JMR<sup>7/</sup> sheet. It has been checked by the assessment team from the JMR<sup>7/</sup> issued by the state electricity board and the same reading can be cross checked with the transmission loss calculation sheet<sup>8/</sup> signed by the representatives of Enercon and APCPDCL.

**Electricity Import recorded at 33kV (JMR at 33kV metering point) cluster metering points connecting total 63 machines of the project activity ( $EG_{pi}$ ):** This is a measured value taken at the electricity meter at 33kV level on site for all the 7 feeders involved in the project activity. This reading is taken every month by the representatives of Enercon and the state utility jointly and the same can be checked from the JMR<sup>7/</sup> sheet. It has been checked by the assessment team from the JMR<sup>7/</sup> issued by the state electricity board and the same reading can be cross checked with certified statement given by state utility showing cost of export and import<sup>9/</sup>.

**Electricity Export recorded at 132 kV meters (main and check) at ENERCON pooling substation connecting machines of the project activity and machines commissioned by the other project developers ( $EG_e$ ):** This is a measured value taken at the energy meter installed at ENERCON pooling substation. This reading is taken every month by the representatives of Enercon and the state utility jointly and the same can be checked from the JMR<sup>7/</sup> sheet. It has been checked by the assessment team from the JMR<sup>7/</sup> issued by the state electricity board and the same reading can be cross checked with from transmission loss calculation sheet<sup>8/</sup> signed by the representatives of Enercon and APCPDCL

**Total percentage of Transmission loss for export between the metering point at 33 kV metering points (sum of all the WECs connected to Bulk metering point including non-project activity as well as project activity WECs) and the metering point at 132 kV at the ENERCON pooling substation (Lep):** The transmission losses are calculated based on the formula mentioned in the PPA<sup>16/</sup>. These transmission losses equally distributed to all the WECs connected on metering point at 132 kV at the ENERCON pooling substation. It has been checked by the assessment team with the JMR<sup>7/</sup> issued by the state electricity board.

During the site visit and interview with the PP it was found that the actual monitoring and calculation for net electricity supplied to the grid is being done as per the procedure mentioned in the registered monitoring plan and PPA<sup>/16/</sup> and the same is explained below:

The net electricity supplied to the grid is calculated by applying transmission loss to the meter readings taken at 33 kV metering point of the project activity.

The procedure for calculation of the transmission loss is as follows:

Each project developer has dedicated individual metering system at 33kV. Energy export ( $X_{\text{Export}, N}$ ) and import ( $X_{\text{Import}, N}$ ) is recorded for the individual developers at 33 KV metering point; Where N is number of project developers connected to 132 kV metering point of the ENERCON substation

Total % of transmission losses for export (  $Lep$ ) are calculated as per following formula:

$$Lep (\%) = \frac{\{(X_{\text{Export},1} + X_{\text{Export},2} + X_{\text{Export},3} + \dots + X_{\text{Export},N}) - EGe\} * 100}{(X_{\text{Export},1} + X_{\text{Export},2} + X_{\text{Export},3} + \dots + X_{\text{Export},N})}$$

Where, EGe = Electricity export to the grid recorded at 132 kV (bulk meter) at the ENERCON pooling substation.

Value of  $Lep$  is calculated by state utility and would be sourced directly from the transmission loss calculation sheet.

Hence,

Electricity exported by project activity to grid after apportioning of transmission losses between 33kV metering point (Cluster meter) & 132kV metering point (Bulk meter)

$$EG_{\text{export}, y} = EGe * (1 - Lep (\%))$$

The Joint meter reading noted at 33 KV metering location contains the following data:-

1. Electricity Export
2. Electricity Import

The electricity export and import by the project activity can be cross checked cross checked from the certified statement of electricity export and import signed by APCPDCL/State Utility<sup>/9/</sup>. It may be noted that energy export by the project activity will be import by the grid from the project activity and therefore electricity export by the project activity is denoted as import by the grid in the certified statement by the state utility<sup>/9/</sup>. Similarly, energy import by the project activity will be export by the grid to the project activity and therefore electricity import by the project activity is denoted as export by the grid in the certified statement by the state utility.

Net Electricity supplied to the Grid is calculated as:

$$EG_{PJ,y} = EG_{\text{export}, y} - EG_{pi}$$

**Where:**

**EGe** = Electricity Export recorded at 132 kV meters (main and check) at ENERCON pooling substation connecting machines of the project activity and machines commissioned by the other project developers.

**EG<sub>PJ,y</sub>** = Net Electricity supplied to the grid by the project activity

**EG<sub>export, y</sub>** = Electricity exported by project activity to grid after apportioning of transmission losses between 33kV metering point (Cluster meter) & 132kV metering point (Bulk metering point)

**EG<sub>pe</sub>** = Electricity Export recorded at 33kV (JMR at 33kV metering point) cluster metering points connecting total 63 machines of the project activity

**EG<sub>pi</sub>** = Electricity Import recorded at 33kV (JMR at 33kV metering point) cluster metering points connecting total 63 machines of the project activity

**Lep** = Total percentage of Transmission loss for export between the metering point at 33 kV metering points (sum of all the WECs connected to Bulk metering point including non-project activity as well as project activity WECs) and the metering point at 132 kV at the ENERCON pooling substation

Monitoring Report, onsite checks  Registered Monitoring Plan & Approved Methodology	Requirement in the registered monitoring plan	Implementation of the project	Conclusion on the compliance of the implementation with the monitoring plan
<b>Data/Parameter</b>	<b>EG<sub>P,J,y</sub></b>	<b>EG<sub>P,J,y</sub></b>	Complies with the registered monitoring plan
<b>Description</b>	Net electricity supplied to the grid by the Project activity	Net electricity supplied to the grid by the Project activity	Complies with the registered monitoring plan
<b>Measured/Calculated /Default</b>	Calculated	Calculated	Complies with the registered monitoring plan
<b>Source of data</b>	Net electricity supplied to the grid by the Project activity calculated using the formula described in Section C of MR	Net electricity supplied to the grid by the Project activity calculated using the formula described in Section C of MR	Complies with the registered monitoring plan
<b>Monitoring equipment</b>	Calculated as per formulas better described under section C of MR	Calculated as per formulas better described under section C of MR	Complies with the registered monitoring plan
<b>Measuring/Reading/ Recording frequency</b>	Monthly: The apportioning is done as per the procedure described in section C of MR	Monthly: The apportioning is done as per the procedure described in section C of MR	Complies with the registered monitoring plan
<b>Calculation method (if applicable)</b>	Calculated using formulae $EG_{\text{export}, y} = EG_{\text{pe}} * (1 - Lep (\%))$ Refer section C for details and description of the above variables.	Calculated using formulae $EG_{\text{export}, y} = EG_{\text{pe}} * (1 - Lep (\%))$ Refer section C for details and description of the above variables.	Complies with the registered monitoring plan
<b>QA/QC procedures</b>	Value of $EG_{\text{export}, y}$ can be crosschecked from certified statement given by state utility showing cost of export and import. It may be noted that energy export by the project activity will be import by the grid from the project activity and therefore electricity export by the project activity is	Value of $EG_{\text{export}, y}$ can be crosschecked from certified statement given by state utility showing cost of export and import. It may be noted that energy export by the project activity will be import by the grid from the project activity and therefore electricity	Complies with the registered monitoring plan

	denoted as import by the grid in the certified statement by the state utility.  QA/QC procedures have been implemented by Discom/State utility pursuant to the provisions of the power purchase agreement except or otherwise explicitly stated in the PDD.	export by the project activity is denoted as import by the grid in the certified statement by the state utility.  QA/QC procedures have been implemented by Discom/State utility pursuant to the provisions of the power purchase agreement except or otherwise explicitly stated in the PDD.	
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Monitoring Report, onsite checks Registered Monitoring Plan & Approved Methodology	Requirement in the registered monitoring plan	Implementation of the project	Conclusion on the compliance of the implementation with the monitoring plan
<b>Data/Parameter</b>	<b>EG<sub>Export,y</sub></b>	<b>EG<sub>Export,y</sub></b>	Complies with the registered monitoring plan
<b>Description</b>	Electricity exported by project activity to grid after apportioning of transmission losses between 33kV metering point (Cluster meter) & 132kV metering point (Bulk metering point)	Electricity exported by project activity to grid after apportioning of transmission losses between 33kV metering point (Cluster meter) & 132kV metering point (Bulk metering point)	Complies with the registered monitoring plan
<b>Measured/Calculated /Default</b>	Calculated	Calculated	Complies with the registered monitoring plan
<b>Source of data</b>	Electricity exported by project activity calculated using the formula described in Section C of MR	Electricity exported by project activity calculated using the formula described in Section C of MR	Complies with the registered monitoring plan
<b>Monitoring equipment</b>	Calculated as per formulas better described under section C of MR	Calculated as per formulas better described under section C of MR	Complies with the registered monitoring plan
<b>Measuring/Reading/ Recording frequency</b>	Monthly: The apportioning is done as per the procedure described in section C of MR	Monthly: The apportioning is done as per the procedure described in section C of MR	Complies with the registered monitoring plan

<b>Calculation method (if applicable)</b>	<p>Calculated using formulae</p> $EG_{\text{export, y}} = EG_{\text{pe}} * (1 - \text{Lep} (\%))$ <p>Refer section C for details and description of the above variables</p>	<p>Calculated using formulae</p> $EG_{\text{export, y}} = EG_{\text{pe}} * (1 - \text{Lep} (\%))$ <p>Refer section C for details and description of the above variables</p>	Complies with the registered monitoring plan
<b>QA/QC procedures</b>	<p>Value of <math>EG_{\text{export, y}}</math> can be crosschecked from certified statement given by state utility showing cost of export and import. It may be noted that energy export by the project activity will be import by the grid from the project activity and therefore electricity export by the project activity is denoted as import by the grid in the certified statement by the state utility.</p> <p>QA/QC procedures have been implemented by Discom/State utility pursuant to the provisions of the power purchase agreement except or otherwise explicitly stated in the PDD</p>	<p>Value of <math>EG_{\text{export, y}}</math> can be crosschecked from certified statement given by state utility showing cost of export and import. It may be noted that energy export by the project activity will be import by the grid from the project activity and therefore electricity export by the project activity is denoted as import by the grid in the certified statement by the state utility.</p> <p>QA/QC procedures have been implemented by Discom/State utility pursuant to the provisions of the power purchase agreement except or otherwise explicitly stated in the PDD</p>	

Monitoring Report, onsite checks Registered Monitoring Plan & Approved Methodology	Requirement in the registered monitoring plan	Implementation of the project	Conclusion on the compliance of the implementation with the monitoring plan
<b>Data/Parameter</b>	<b>EG<sub>pe</sub></b>	<b>EG<sub>pe</sub></b>	Complies with the Registered Monitoring plan
<b>Description</b>	Electricity Export recorded at 33kV (JMR at 33kV metering point) cluster metering points connecting total 63 machines of the project activity.	Electricity Export recorded at 33kV (JMR at 33kV metering point) cluster metering points connecting total 63 machines of the project activity.	Complies with the Registered Monitoring plan
<b>Measured/Calculated</b>	Measured	Measured	Complies with the Registered Monitoring



<b>/Default</b>			plan
<b>Source of data</b>	Electricity export to the grid as per the joint meter reading recorded at cluster metering points.	Electricity export to the grid as per the joint meter reading recorded at cluster metering points.	Complies with the Registered Monitoring plan
<b>Monitoring equipment</b>	Energy Meter	Energy Meter	Complies with the Registered Monitoring plan
<b>Measuring/Reading/Recording frequency</b>	Measuring frequency: Continuous Recording frequency: Monthly	Measuring frequency: Continuous Recording frequency: Monthly	Complies with the Registered Monitoring plan
<b>Calculation method (if applicable)</b>	Not Applicable	Not Applicable	Complies with the Registered Monitoring plan
<b>QA/QC procedures</b>	Value of <b>EGpe</b> can be cross checked from transmission loss calculation sheet signed by the representatives of Enercon and Discom.  The meters will be calibrated once in five years by the state utility. Refer Section C for an illustration of the provisions for QA/QC procedures.	Value of <b>EGpe</b> can be cross checked from transmission loss calculation sheet signed by the representatives of Enercon and Discom.  The meters will be calibrated once in five years by the state utility. Refer Section C for an illustration of the provisions for QA/QC procedures.	Complies with the Registered Monitoring plan

Monitoring Report, onsite checks Registered Monitoring Plan & Approved Methodology	<b>Requirement in the registered monitoring plan</b>	<b>Implementation of the project</b>	<b>Conclusion on the compliance of the implementation with the monitoring plan</b>
<b>Data/Parameter</b>	<b>EGpi</b>	<b>EGpi</b>	Complies with the registered Monitoring plan
<b>Description</b>	Electricity Import recorded at 33kV (JMR at 33kV metering point) cluster metering points connecting total 63 machines of the project activity.	Electricity Import recorded at 33kV (JMR at 33kV metering point) cluster metering points connecting total 63 machines of the project activity.	Complies with the registered Monitoring plan
<b>Measured/Calculated/Default</b>	Measured	Measured	Complies with the registered Monitoring



			plan
<b>Source of data</b>	Electricity import from the grid as per the joint meter reading recorded at cluster metering point	Electricity import from the grid as per the joint meter reading recorded at cluster metering point	Complies with the registered plan Monitoring
<b>Monitoring equipment</b>	Energy Meter	Energy Meter	Complies with the registered plan Monitoring
<b>Measuring/Reading/Recording frequency</b>	Measuring frequency: Continuous Recording frequency: Monthly	Measuring frequency: Continuous Recording frequency: Monthly	Complies with the registered plan Monitoring
<b>Calculation method (if applicable)</b>	Not Applicable	Not Applicable	Complies with the registered plan Monitoring
<b>QA/QC procedures</b>	Value of EGpi can be crosschecked from certified statement given by state utility showing cost of export and import. It may be noted that energy import by the project activity will be export by the grid to the project activity and therefore electricity import by the project activity is denoted as export by the grid in the certified statement by the state utility.  The meters will be calibrated once in five years by the state utility. Refer Section C for an illustration of the provisions for QA/QC procedures	Value of EGpi can be crosschecked from certified statement given by state utility showing cost of export and import. It may be noted that energy import by the project activity will be export by the grid to the project activity and therefore electricity import by the project activity is denoted as export by the grid in the certified statement by the state utility.  The meters will be calibrated once in five years by the state utility. Refer Section C for an illustration of the provisions for QA/QC procedures	Complies with the registered plan Monitoring

Monitoring Report, onsite checks  Registered Monitoring Plan & Approved Methodology	<b>Requirement in the registered monitoring plan</b>	<b>Implementation of the project</b>	<b>Conclusion on the compliance of the implementation with the monitoring plan</b>
<b>Data/Parameter</b>	<b>EGe</b>	<b>EGe</b>	Complies with the registered plan monitoring

<b>Description</b>	Electricity Export recorded at 132 kV meters (main and check) at ENERCON pooling substation connecting machines of the project activity and machines commissioned by the other project developers.	Electricity Export recorded at 132 kV meters (main and check) at ENERCON pooling substation connecting machines of the project activity and machines commissioned by the other project developers.	Complies with the registered monitoring plan
<b>Measured/Calculated /Default</b>	Measured	Measured	Complies with the registered monitoring plan
<b>Source of data</b>	Electricity export to the grid as per the joint meter reading recorded at 132 KV of the ENERCON pooling substation (Bulk metering point)	Electricity export to the grid as per the joint meter reading recorded at 132 KV of the ENERCON pooling substation (Bulk metering point)	Complies with the registered monitoring plan
<b>Monitoring equipment</b>	Energy Meter	Energy Meter	Complies with the registered monitoring plan
<b>Measuring/Reading/ Recording frequency</b>	Measuring frequency: Continuous Recording frequency: Monthly	Measuring frequency: Continuous Recording frequency: Monthly	Complies with the registered monitoring plan
<b>Calculation method (if applicable)</b>	Not Applicable	Not Applicable	Complies with the registered monitoring plan
<b>QA/QC procedures</b>	Value of EGe can be cross checked from transmission loss calculation sheet signed by the representatives of Enercon and Discom.  The meters will be calibrated once in five years by the state utility. Refer Section C for an illustration of the provisions for QA/QC procedures.	Value of EGe can be cross checked from transmission loss calculation sheet signed by the representatives of Enercon and Discom.  The meters will be calibrated once in five years by the state utility. Refer Section C for an illustration of the provisions for QA/QC procedures.	Complies with the registered monitoring plan

Monitoring Report, onsite checks  Registered	<b>Requirement in the registered monitoring plan</b>	<b>Implementation of the project</b>	<b>Conclusion on the compliance of the implementation with</b>
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Monitoring Plan & Approved Methodology			<b>the monitoring plan</b>
<b>Data/Parameter</b>	<b>Lep</b>	<b>Lep</b>	Complies with the methodology
<b>Description</b>	Total percentage of Transmission loss for export between the metering point at 33 kV metering points (sum of all the WECs connected to Bulk metering point including non-project activity as well as project activity WECs) and the metering point at 132 kV at the ENERCON pooling substation	Total percentage of Transmission loss for export between the metering point at 33 kV metering points (sum of all the WECs connected to Bulk metering point including non-project activity as well as project activity WECs) and the metering point at 132 kV at the ENERCON pooling substation	Complies with the methodology
<b>Measured/Calculated /Default</b>	Calculated as per formulas better described under section C of MR	Calculated as per formulas better described under section C of MR	Complies with the methodology
<b>Source of data</b>	Transmission Loss will directly applied from the joint meter reading for the project activity.	Transmission Loss will directly applied from the joint meter reading for the project activity.	Complies with the methodology
<b>Monitoring equipment</b>	Not Applicable	Not Applicable	Complies with the methodology
<b>Measuring/Reading/ Recording frequency</b>	Monthly. Calculations are based on procedure described in section C	Monthly. Calculations are based on procedure described in section C	Complies with the methodology
<b>Calculation method (if applicable)</b>	Total % of transmission losses for export ( Lep) are calculated as per teh formula mentioned in PPA	Total % of transmission losses for export ( Lep) are calculated as per teh formula mentioned in PPA	Complies with the methodology
<b>QA/QC procedures</b>	NA	NA	Complies with the methodology

The assessment team visited site and all the monitoring parameters as per the requirement of 226-228 of the VVS<sup>19/</sup> and found that the project activity is implemented and operating as per the requirement of methodology and registered monitoring plan.

### 3.5.2 Verification of implementation of sampling plan

Since the project activity is a grid connected wind power project. Thus, Sampling is not required.

### 3.6 Accuracy of Equipment

The frequency of the calibration of the energy meters involved in the project activity was once in a year as mentioned in the registered PDD version 4<sup>/1/</sup>. However, calibration and testing of meters cannot be conducted solely by the project proponent as per provisions of the power purchase agreement (PPA). As per article 4 of the PPA<sup>/16/</sup>, the energy meters shall be jointly inspected and sealed on behalf of both parties (state utilities and the PP) and shall not be interfered with except in the presence of representatives of both the parties. Further as per article 4 of the PPA<sup>/16/</sup>, the PP is not provided with the authority to conduct or appoint the third party for calibration/testing of the energy meters and therefore have to rely on the state utility for conducting calibration/testing of the energy meters. Thus, it is found that the calibration and testing of the meters are not under control of the PP. Additionally, The applied methodology ACM0002<sup>/3/</sup> version 11 does not specify any specific time period for conducting the calibration/testing of the equipment. Further as per national regulations on installation and operation of meters in accordance with section 18 subsection 1 (b), Calibration and periodical testing of meters by Central Electricity Authority (CEA)<sup>/21/</sup> of India; the energy meters shall be calibrated and tested once in five year. The assessment team has checked the PPA<sup>/16/</sup>, methodology and CEA<sup>/21/</sup> metering regulations. [section 18 subsection 1 (b)) and found that it is accordance with the local/National standard (para 242 of the VVS)<sup>/19/</sup>. Considering this issues CAR#08 was raised and the same has been discussed under section 3.2 (Post Registration Change).

As the calibration frequency of the energy meters are changed to the 5 years in the revised PDD, version 05<sup>/1/</sup> and the same has been accepted to the assessment team, the calibration of the energy meters are not required at this stage of the verification. The calibration of all the energy meters was done at the time of commissioning of all the WECs, thus the next calibration would be due after five years of the first calibration date. The commissioning dates for all the WECs are different as mentioned in the table below. There is no delay has been observed in the calibration of the energy meters.

During the course of verification some issues were identified as discussed below:

#### CAR#03:

- a. From MR<sup>/5/</sup> version 1, it has been observe that for Vaayu (India) Power Corporation Private Limited (Phase-2), the calibration due date is 24/09/2011, whereas the current monitoring period is up to 26/09/2011, and there is no details for the current calibration for this meter. Thus, the PP is requested to kindly justify the delay in the calibration in line to EB 52, Annex 60. Moreover, It has been observed from the calibration certificates that there is inconsistency in the calibration dates for Vaayu Phase -2 in the Monitoring report as well as in the CER spreadsheet. The PP is requested to kindly clarify the same. In response, the PP has clarified that the methodology doesn't specify the calibration requirement of the energy meters. As per the registered PDD<sup>/1/</sup> the PP was supposed to conduct the calibration of the meters at least once in a year. However, it is not under control of the PP to carry out the calibration once in a year, because calibration/ testing of the meters will be done by the state electricity board for all the WECs connected on same meters. Further as per national regulations on installation and operation of meters in accordance with section 18 subsection 1 (b), Calibration and periodical testing of meters by Central Electricity Authority (CEA)<sup>/21/</sup> of India; the energy meters shall be calibrated and tested once in five year. Thus, the PP requested revision in monitoring period on this concern and the same is acceptable as per the revised Monitoring plan. Furthermore, calibration date of the phase 2 has been corrected. It has been checked with the calibration certificate and found correct. CLOSED
- b. The PP was requested to kindly include the complete calibration details in the monitoring report<sup>/5/</sup> in particular, under section C & section D. Moreover, same information has to be included in the spreadsheet. In response, the PP has provided the revised MR<sup>/5/</sup> with change in calibration frequency. All the calibration details of meters, accuracy of energy meters, calibration entity and the due date of calibration was mentioned in the revised MR<sup>/5/</sup>. It has been checked by the assessment team and found correct. CLOSED
- c. The PP was requested to kindly justify the gap in the calibrations for the substation bulk meters, since some delay / gap has been observed in the calibration of the substation meters. The MR<sup>/5/</sup> indicates the calibration of Vaayu (India) Power Corporation Private Limited (Phase-1, Phase 4 and Phase 7) , main & check meters on 03/08/2011, whereas the MP<sup>/5/</sup> start from 25/04/2011 and for Vaayu (India) Power Corporation Private Limited (Phase-2, Phase 3, Phase 5 and Phase 6), main & check meters on 26/08/2011 whereas the MP start from 25/04/2011. In response PP has

clarified that as per national regulations on installation and operation of meters in accordance with section 18 subsection 1 (b), Calibration and periodical testing of meters by Central Electricity Authority (CEA)<sup>/21/</sup> of India; the energy meters shall be calibrated and tested once in five year. Thus, the PP requested revision in monitoring period on this concern and the same is acceptable as per the revised Monitoring plan. CLOSED

- d. The PP was requested to kindly provide the calibration certificates for WECs for the Vaayu (India) Power Corporation Private Limited (Phase-1). In response, the PP has provided the calibration certificates of the meter installed for phase 1 of the project activity. It has been checked by the assessment team and found consistent with the dates mentioned in the revised MR<sup>/5/</sup>. CLOSED

The review of the revised monitoring report and on site assessment by the assessment team confirms that the project implementation is in accordance with the registered project design document, version 4, dated 03/02/2011<sup>/1.1/</sup>, revised PDD version 05 dated 22/05/2012<sup>/1.2/</sup> and the project implementation requirements are in line with the paragraph 234 of VVS<sup>/19/</sup>, Version 02. Thus, CAR#03 was closed successfully.

Monitoring equipment	Monitoring parameter	S/N	Accuracy Class	Type	Calibration frequency requirement	Calibration date	Validity	Are there delays in calibration ?	Calibration Entity	Accreditation Certificate for the calibration entity Issuing authority Relevant
<b>33 KV Calibration Reports for Vaayu (Phases 1 - 7)</b>										
Energy Meter (Phase 1)	Electricity Export & Electricity Import	AP900318	0.2%	Main	Once in a Five Year	02/08/2010	01/08/2015	No	Officials of the state utility.	NABL
Energy Meter (Phase 1)	Electricity Export & Electricity Import	AP900320	0.2%	Check	Once in a Five Year	02/08/2010	01/08/2015	No	Officials of the state utility.	NABL
Energy Meter (Phase 2)	Electricity Export & Electricity Import	AP900327	0.2%	Main	Once in a Five Year	27/09/2010	26/09/2015	No	Officials of the state utility.	NABL
Energy Meter (Phase 2)	Electricity Export & Electricity Import	AP900328	0.2%	Check	Once in a Five Year	27/09/2010	26/09/2015	No	Officials of the state utility.	NABL
Energy Meter (Phase 3)	Electricity Export & Electricity Import	AP900314	0.2%	Main	Once in a Five Year	30/03/2011	29/03/2016	No	Officials of the state utility.	NABL
Energy Meter (Phase 3)	Electricity Export &	AP900315	0.2%	Check	Once in a Five Year	30/03/2011	29/03/2016	No	Officials of the state utility.	NABL

	Electricity Import									
Energy Meter (Phase 4)	Electricity Export & Electricity Import	AP900338	0.2%	Main	Once in a Five Year	27/09/2010	26/09/2015	No	Officials of the state utility.	NABL
Energy Meter (Phase 4)	Electricity Export & Electricity Import	AP900339	0.2%	Check	Once in a Five Year	27/09/2010	26/09/2015	No	Officials of the state utility.	NABL
Energy Meter (Phase 5)	Electricity Export & Electricity Import	AP900319	0.2%	Main	Once in a Five Year	30/09/2010	29/09/2015	No	Officials of the state utility.	NABL
Energy Meter (Phase 5)	Electricity Export & Electricity Import	AP900321	0.2%	Check	Once in a Five Year	30/09/2010	29/09/2015	No	Officials of the state utility.	NABL
Energy Meter (Phase 6)	Electricity Export & Electricity Import 02/12/2010	AP900329	0.2%	Main	Once in a Five Year	02/12/2010	01/12/2015	No	Officials of the state utility.	NABL
Energy Meter (Phase 6)	Electricity Export & Electricity Import	AP900330	0.2%	Check	Once in a Five Year	02/12/2010	01/12/2015	No	Officials of the state utility.	NABL
Energy Meter (Phase 7)	Electricity Export & Electricity Import	AP900331	0.2%	Main	Once in a Five Year	31/12/2010	30/12/2015	No	Officials of the state utility.	NABL

	Electricity Import									
Energy Meter (Phase 7)	Electricity Export & Electricity Import	AP900332	0.2%	Check	Once in a Five Year	31/12/2010	30/12/2015	No	Officials of the state utility.	NABL
<b>132 KV Bulk Meter Calibration Reports (EIL - Sub Station)</b>										
Energy Meter (Phase 1,4 & 7)	Electricity Export	5341444	0.2%	Main	Once in a Five Year	31/03/2010	02/08/2015	No	Officials of the state utility.	NABL
Energy Meter (Phase 1,4 & 7)	Electricity Export	5342869	0.2%	Check	Once in a Five Year	31/03/2010	02/08/2015	No	Officials of the state utility.	NABL
		10286994				03/08/2011	02/08/2016			
Energy Meter (Phase 2,3,5 & 6)	Electricity Export	5341380	0.2%	Main	Once in a Five Year	16/05/2011	15/05/2016	No	Officials of the state utility.	NABL
		11070263				26/08/2011	25/08/2016			
Energy Meter (Phase 2,3,5 & 6)	Electricity Export	5341442	0.2%	Check	Once in a Five Year	16/05/2011	15/05/2016	No	Officials of the state utility.	NABL
		11070295				26/08/2011	25/08/2016			



Please note that the previous check meter(5342869) for Phase 1,4 & 7 was replaced with new check meter (10286994) on 03/08/2011 due to defect in meter scrolling. Also, *previous* Main (5341380) and *previous* check meter(5341442) were replaced with new meters i.e. main meter(11070263) and check meter(11070295) on 26 August, 2011 due to defect in meter scrolling. It is noteworthy, that the previous meters were also duly calibrated and their respective validity covers the current monitoring.

### 3.7 Summary of compliance with the calibration frequency requirements for measuring instruments.

The frequency of the calibration of the energy meters involved in the project activity was once in a year as mentioned in the registered PDD<sup>/1/</sup>. However, the calibration and testing of the meters are not under control of the PP. Additionally, The applied methodology ACM0002<sup>/3/</sup> version 11 does not specify any specific time period for conducting the calibration/testing of the equipment. Thus, the PP requested the revision in monitoring plan to change the calibration frequency as once in a five year and assessment team accepted the same. The calibration of the energy meters is not required at this stage of the verification. The calibration of all the energy meters was done at the time of commissioning of all the WECs, thus the next calibration would be due after five years of the first calibration date. The commissioning dates for all the WECs are different as above mentioned table. There is no delay has been observed in the calibration of the energy meters.

### 3.8 Accuracy of Emission Reduction Calculations

In this project activity, a complete set of data for the specified monitoring period (25/04/2011 to 25/03/2012) has been made available to the verifier as indicated under section 4 these data are duly verified and cross-checked from certified statement given by state utility showing cost of export and import and transmission loss calculation sheet signed by the representatives of Enercon and APDCPDCL<sup>/8/</sup>.

The data for each parameter has been verified from its specific source i.e. Joint Meter Reading (JMR)<sup>/7/</sup>. The methods and formulae used for calculating baseline emissions and emission reduction have been followed as per the monitoring plan as mentioned in the registered PDD<sup>/1/</sup>.

The details of the reported and the verified values for all parameters are listed in section 4, 'Calculation of Emission Reductions'<sup>/4/</sup>. It has been confirmed that appropriate methods and formulae for calculating baseline emissions, project emissions and leakage have been followed in the project activity. Moreover, the assessment team has confirmed that the assumptions, emission factors and default values that were applied in the calculations have been justified. CAR#05 and CAR#06 were raised during the course of verification as discussed below

**CAR#05:** it was observed in the version 1 of MR<sup>/5/</sup> that all the values for "Electricity exported to grid after apportioning of transmission losses" are not found to be consistent with the JMR<sup>/7/</sup> sheet. In response the PP has provided the revised MR<sup>/5/</sup> with corrections and the same has been checked by the assessment team with the certified statement given by state utility<sup>/9/</sup> and found correct. Thus, CAR#05 was closed successfully.

**CAR#06:** it was observed in the version 1 of MR that all the values for "Electricity Import recorded at 33kV" for the month of July 2011 (Phase 1, 2, 4 & 5) & August 2011 (Phase 2, 3 & 6) are not matching with those of JMR<sup>/7/</sup> values. In response, the PP has provided the revised MR with corrections and the same has been checked by the assessment team with certified statement<sup>/8/</sup> given by state utility showing cost of export and import and found correct.

Additionally, some of the issues identified regarding the emission reduction calculations as mentioned below:

- Annual estimated ER is estimated for 335 days but current monitoring period contains 336 days
- Value of **E<sub>Ge</sub>** is constant for few months or same for few phases for particular months

- Some of the cells showing error (Generation details) in emission reduction sheet. The PP is requested to mention the correct values of estimated ER for current MP as per the registered PDD.

In response the PP has corrected the error in estimation of emission reduction calculation for 336 days. Also, the PP has clarified that the value of EGe is recorded at 132 kV meters (main and check) at ENERCON pooling substation connecting machines of the project activity and machines commissioned by the other project developers. Thus, the reading would same for all the phases connected on same metering point. This value is used to calculate the net electricity supplied to the grid by each phase. Further, all the Vaayu phases were connected to single 132 KV bulk metering point at sub-station during the month of May, 2011. Due to increase in connected load at sub-station, two 132 KV bulk metering point were used to measure electricity generation from the month June, 2011 onwards. However, this does not impact overall emission reductions during the current monitoring period. Furthermore, all the values in the revised emission reduction sheet have been rounded down. The revised emission reduction sheet has been checked by the assessment team and found that there is no error in the cells showing error (Generation details).

All the issues raised under CAR#06 have been properly addressed in the revised MR. Thus, CAR#06 is closed.

The details of the reported and the verified values for all parameters are listed in section 4, 'Calculation of Emission Reductions'<sup>1/4/</sup>.

### **3.9 Quality of Evidence to Determine Emission Reductions**

Critical parameters used for the determination of the Emission Reductions are discussed in section 3.4 above. All the data recorded is in compliance with the monitoring report.

### **3.10 Management and operational System and Quality Assurance**

The companies involved in the project have a quality assurance system implemented; therefore we can affirm that the management system the CDM project is in place; with the responsibilities properly identified and in place.

In order to verify data quality, the Companies involves in the project works in accordance with a quality assurance procedure (*Procedure for Monitoring Plan Implementation*), which establishes the operational and management structure implemented.

### 3.11 Data from External Sources

Data for below mentioned monitoring parameters is used from external sources as per the Monitoring plan:-

**Combined Margin CO<sub>2</sub> emission factor of Southern Regional Grid ( $EF_{grid,CM,y}$ ):** This parameter is calculated once at the time of registration of the project activity. The data is used to calculate the baseline emissions. The Combined margin CO<sub>2</sub> emission factor of Southern grid, which fixed ex-ante for this particular project activity, is 0.94515 tCO<sub>2</sub>/ MWh. This value has been sourced from Central Electricity Authority (CEA) published CO<sub>2</sub> data base, version 5.0<sup>(11/)</sup>. The value as mentioned in the MR<sup>(5/)</sup> has been compared with the value mentioned in the registered PDD<sup>(1/)</sup> and is found to be consistent.

**CO<sub>2</sub> operating margin emission factor of the grid ( $EF_{OM,y}$ ):** The data is used to calculate the CO<sub>2</sub> emission factor of the grid which is in turn used to calculate the baseline emissions. This parameter is calculated once at the time of registration of the project activity, as mentioned in the monitoring plan and the registered PDD<sup>(1/)</sup>. The CO<sub>2</sub> operating margin emission factor of the grid which fixed ex-ante is 0.98756 tCO<sub>2</sub>/MWh. This value has been sourced from Central Electricity Authority (CEA)<sup>(11/)</sup> published CO<sub>2</sub> data base, version 5.0. The value as mentioned in the MR<sup>(5/)</sup> has been compared with the value mentioned in the registered PDD<sup>(1/)</sup> and is found to be consistent.

**CO<sub>2</sub> build margin emission factor of the grid ( $EF_{BM,y}$ ):** The data is used to calculate the CO<sub>2</sub> emission factor of the grid which is in turn used to calculate the baseline emissions. This parameter is calculated once at the time of registration of the project activity as mentioned in the monitoring plan and the registered PDD<sup>(1/)</sup>. CO<sub>2</sub> build margin emission factor of the grid which fixed ex-ante is 0.81792 tCO<sub>2</sub>/MWh. This value has been sourced from Central Electricity Authority (CEA)<sup>(11/)</sup> published CO<sub>2</sub> data base<sup>(11/)</sup>, version 5.0. The value as mentioned in the MR<sup>(5/)</sup> has been compared with the value mentioned in the registered PDD<sup>(1/)</sup> and is found to be consistent.

#### 4. Calculation of Emission Reductions

Parameter	Reported Value ( as per MR, ver. 1.0 due to extension in monitoring period)	Verified Value (Final MR, ver. 1.3)
Net electricity supplied to the grid (MWh), $EG_{PJ,y}$	98740.375	98740.367
Electricity exported to grid after apportioning of transmission Losses (MWh), $EG_{Export,y}$	98803.075	98803.067
Electricity Export recorded at 33kV (MWh), $EG_{pe}$	99766.700	99766.700
Electricity Import recorded at 33kV (MWh) $EG_{pi}$	62.700	62.700
Electricity Export recorded at 132 Kv (MWh), $EG_e$	588155.000	153319.000
Transmission loss (%), $L_{ep}$	89	89

The emission reductions  $ER_y$  by the project activity during a given year  $y$  is the difference between baseline emissions ( $BE_y$ ), project emissions ( $PE_y$ ), and emissions due to leakage ( $L_y$ ), as follows:

$$ER_y = BE_y - PE_y - L_y$$

Where,

- $ER_y$ : Emission reductions of the project activity during the year  $y$  in  $tCO_2$ ,  
 $BE_y$ : Baseline emissions due to displacement of electricity during the year  $y$  in  $tCO_2$ ,  
 $PE_y$ : Project emissions during the year  $y$  in  $tCO_2$ .  
 $LE_y$ : Leakage emission during the year  $y$  in  $tCO_2$ .

The baseline emissions are calculated as the product of the electricity supplied to the grid by the project activity ( $EG_y$ ) in MWh and the Baseline Emission Factor ( $EF_y$ ) of the NEWNE grid of India in  $tCO_2/MWh$ . The baseline emission factor was fixed ex-ante as 0.94515  $tCO_2/MWh$ . Therefore baseline emissions are calculated as:

$$BE_y = EG_y * EF_y$$

Summary of Baseline emissions calculations are detailed below -

$$\begin{aligned} EG_{PJ,y} &= 98740.367 \text{ MWh} \\ EF_{grid,CM,y} &= 0.94515 \text{ tCO}_2\text{e/MWh} \\ BE_y &= 98740.367 \times 0.94515 \\ &= 93324 \text{ tCO}_2\text{e} \end{aligned}$$

**Summary of Baseline emissions calculations are detailed below:**

**ERy** = BEy- PEy- LEy  
= 93324 -0-0  
= 93324 tCO<sub>2</sub>e



## **5. Recommendations for Changes in the Monitoring Plan**

No further recommendation is given to improve the monitoring plan.

## 6. Overview of Results

### Assessment Against the Provisions of Decision 17/CP.7:

Is the project documentation in accordance with the requirements of the registered PDD and relevant provision of decision 17/CP.7, EB decisions and guidance and the COP/MOP?

*Yes. The results of the compliance assessment are recorded in the verification checklist which is used as an internal report only.*

Have on-site inspections been performed that may comprise, inter alia, a review of performance records, interviews with project participants and local stakeholders, collection of measurements, observations of established practices and testing of the accuracy of monitoring equipment?

*Yes. Mr. Nayan Jyoti Deka (Lead Assessor/Expert) and Mr. Ajay Singh Thakur (Assessor/ Local Assessor) visited the site and undertook interviews, collected data, audited the implementation of procedures, checked calibration certificates and checked data, inter alia.*

*The results of the site visits are recorded in the verification checklist which is used as an internal report only.*

*The evidences have been checked and collected. The final monitoring report is attached with this verification report.*

Has data from additional sources been used? If yes, please detail the source and significance.

*Yes, this is briefly discussed in section 3.11 above.*

*"CO<sub>2</sub> emission factor of the grid (EF<sub>y</sub>)" The data is calculated from CEA published Database, Version 5.0 and fixed ex-ante as 0.94515 tCO<sub>2</sub>/MWh as per the MP. This being from the registered PDD<sup>11</sup> found correct.*

*"CO<sub>2</sub> operating margin emission factor of the grid (EF<sub>OM,y</sub>)": - The data is used from CEA published Database<sup>11</sup>, Version 5.0 and fixed ex-ante as 0.98756tCO<sub>2</sub>/MWh as per the MP. This is verified from the registered PDD<sup>11</sup> and found correct.*

*"CO<sub>2</sub> build margin emission factor of the grid (. EFBM,y)": - The data is used from CEA published Database/11/, Version 5.0 and fixed ex-ante as 0. 81792 tCO<sub>2</sub>/MWh, as per the MP. This is verified from the registered PDD and found correct.*

Please review the monitoring results and verify that the monitoring methodologies for the estimation of reductions in anthropogenic emissions by sources have been applied correctly and their documentation is complete and transparent.

*Yes. The monitoring methodology has been correctly applied and the monitoring report and supporting references are complete and transparent.*

Have any recommendations for changes to the monitoring methodology for any future crediting period been issued to the project participant?

NO

Determine the reductions in anthropogenic emissions by sources of greenhouse gases that would not have occurred in the absence of the CDM project activity, based on the data and information using calculation procedures consistent with those contained in the registered project design document and the monitoring plan.

*The data used in anthropogenic emission reduction calculation is consistent with those contained in the registered PDD and monitoring plan. The emission reduction was 85584 tCO<sub>2</sub> for the period 25/04/2011 to 25/03/2012 as per the estimation made in the registered PDD. The actual emission reduction has been verified as 93324 tCO<sub>2</sub> for the same period.*

Identify and inform the project participants of any concerns related to the conformity of the actual project activity and its operation with the registered project design document. Project participants shall address the concerns and supply relevant additional information.

*“No such non conformity of the actual project activity and its operation with the registered project design document has been observed.”*

Post monitoring report on UNFCCC website

*Yes, the monitoring report is available at ref. 4677 on UNFCCC website*

<http://cdm.unfccc.int/Projects/DB/DNV-CUK1302613748.83/view>



## 7. Verification and Certification Statement

SGS United Kingdom Ltd has been contracted by Vaayu (India) Power Corporation Private Limited to perform the verification of the emission reductions reported for the CDM project Vaayu India Wind Power Project in Andhra Pradesh and UNFCCC Reference Number: 4677 in the period 25/04/2011 to 25/03/2012.

The verification is based on the validated and registered project design document and the monitoring report for this project. Verification is performed in accordance with section I of Decision 3/CMP.1, and relevant decisions of the CDM EB and CoP/MoP. The scope of this engagement covers the verification and certification of greenhouse gas emission reductions generated by the above project during the above mentioned period, as reported in Vaayu India Wind Power Project in Andhra Pradesh dated 13/07/2012 version 1.3.

The management of the Vaayu (India) Power Corporation Private Limited is responsible for the preparation, calculation and determination of GHG emission reductions from the project. The development and maintenance of records and reporting procedures are in accordance with the monitoring report.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the project for the period 25/04/2011 to 25/03/2012 based on the reported emission reductions in the Monitoring Report Version 1.3 dated 13/07/2012 for the same period.

Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these, SGS planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that this reported amount of GHG emission reductions for the period is fairly stated.

SGS confirms that the project is implemented as described in the validated and registered project design documents. Based on the information we have seen and evaluated, we confirm the following:

Project Title:	Vaayu India Wind Power Project in Andhra Pradesh
UNFCCC Reference Number:	4677
Registered PDD and Approved Used for Verification:	PDD version 04 dated 03/02/2011 PDD, version 05, dated – 22/05/2012 (Revised PDD as per Appendix – 1 of Project Standard, EB 65, Annex 5 )
Methodology Used for Verification:	ACM0002 Version 11 dated 26/02/2010
Applicable Period:	25/04/2011 to 25/03/2012 (changed from 25/04/2011- 26/09/2011, refer section 3.1 of the report)
Total GHG Emission Reductions Verified:	93324 tCO <sub>2</sub> e

**Signed on behalf of the Verification Body by Authorized Signatory**



Signature:

Name: Siddharth Yadav

Date: 13/08/2012

## 8. Document References

Reference ID	Document												
/1/	<div>1.1 Registered PDD version 4 dated 03/02/2011</div> <div>1.2 PDD, version 05, dated – 22/05/2012_clean (Final revised PDD as per Appendix – 1 of PS EB 65, Annex 5)</div> <div>1.3 PDD, version 05, dated – 22/05/2012_track change (Final revised PDD as per Appendix – 1 of PS EB 65, Annex 5)</div>												
/2/	Final Validation Report revision 02 dated 08/04/2011												
/3/	Approved baseline and monitoring methodology ACM0002 version 11 dated 12/02/2010												
/4/	Emission reduction calculation sheet for the period of 25/04/2011 to 25/03/2012												
/5/	<div><div><div><div>• Monitoring Report , version 1, dated – 21/11/2011( Initial published MR before extension of monitoring period)</div><div>• Monitoring Report , version 1, dated 12/04/2012(Revised MR with extension in Monitoring period submitted to DOE before second site visit)</div><div>• Monitoring Report , version 1.1, dated – 17/05/2012</div><div>• Monitoring Report , version 1.2, dated – 01/06/2012</div><div>• Monitoring Report , version 1.3, dated – 13/07/2012 (Final )</div></div></div><table><tr><th>MR Version</th><th>Date of revision</th><th>Main changes and reasons for revision</th></tr><tr><td>Version 1.1</td><td>25/03/2012</td><td><div><div>• The monitoring period was extended till 25/03/2012</div><div>• PP has requested revision in monitoring plan regarding the change in calibration frequency of energy meters</div><div>• Details of physical Location (latitude and longitude) have been included as Appendix 1 of the MR</div><div>• Commissioning schedule of the WECs has been included as appendix 2 of the MR</div><div>• Baseline information of the project activity has been included as appendix 3 of the MR</div><div>• Generation details for the monitoring period have been included as appendix 4 of the MR</div></div></td></tr><tr><td>Version 1.2</td><td>01/06/2012</td><td>Latest template for MR has been used as per the VVS Track</td></tr><tr><td>Version 1.3</td><td>13/07/2012</td><td><div><div>• Annual estimated ER is changed for 336 days</div><div>• Description of the monitoring parameter has been included in section C of the MR</div><div>• Value of EGe has been corrected in section D.2 of the MR</div></div></td></tr></table></div>	MR Version	Date of revision	Main changes and reasons for revision	Version 1.1	25/03/2012	<div><div>• The monitoring period was extended till 25/03/2012</div><div>• PP has requested revision in monitoring plan regarding the change in calibration frequency of energy meters</div><div>• Details of physical Location (latitude and longitude) have been included as Appendix 1 of the MR</div><div>• Commissioning schedule of the WECs has been included as appendix 2 of the MR</div><div>• Baseline information of the project activity has been included as appendix 3 of the MR</div><div>• Generation details for the monitoring period have been included as appendix 4 of the MR</div></div>	Version 1.2	01/06/2012	Latest template for MR has been used as per the VVS Track	Version 1.3	13/07/2012	<div><div>• Annual estimated ER is changed for 336 days</div><div>• Description of the monitoring parameter has been included in section C of the MR</div><div>• Value of EGe has been corrected in section D.2 of the MR</div></div>
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Version 1.3	13/07/2012	<div><div>• Annual estimated ER is changed for 336 days</div><div>• Description of the monitoring parameter has been included in section C of the MR</div><div>• Value of EGe has been corrected in section D.2 of the MR</div></div>											

			<ul style="list-style-type: none"> <li>Reference and source of the Lep has been included in section D.2 of the MR</li> <li>The calculation of ex ante emission reduction has been corrected</li> <li>Some editorial changes have been made in the MR</li> </ul>	
/6/	Calibration certificates for all the energy meter involved in the project activity for the period of 25/04/2011 to 25/03/2012			
/7/	Joint meter reading covering entire monitoring period for the period of 25/04/2011 to 25/03/2012			
/8/	Transmission Losses Calculation for the period of 25/04/2011 to 25/03/2012			
/9/	Certified statement given by state utility showing cost of export and import for the period of 25/04/2011 to 25/03/2012			
/10/	Commissioning certificates for all the WTGs involved in the project activity			
/11/	CEA data base version 05 published in the month of November 2009			
/12/	UNFCCC website <a href="http://cdm.unfccc.int/">http://cdm.unfccc.int/</a>			
/13/	Evidence related to QA/QC procedure			
/14/	Single line diagram describing entire monitoring arrangement			
/15/	O&M contract for the project activity with Enercon			
/16/	PPA for the project activity between PP and APCPDCL			
/17/	Internal Audit Report for the project activity			
/18/	Undertaking letter from the supplier for the WEC controller meter calibration			
/19/	Validation Verification Standard (VVS) version 02 dated 25/11/2011			
/20/	Project Standard dated 25/11/2011			
/21/	Guideline for Calibration and periodical testing of meters by Central Electricity Authority (CEA) of India			
/22/	EB 65, annex 5 (clean development mechanism project standard, version 1.0),			
/23/	Mail communication from UN confirmation for the extension of the monitoring period. Dated – 02/05/2012			

## 9. Findings Overview

	CARs	CLs	FARs
Total Number raised	10	0	0

Date:	13/12/2011		Raised by:	Assessment Team		
Type:	CAR	Number:	01		Reference:	AU4/MR
<b>Lead Assessor Comment:</b>				<b>Date:</b> 13/12/2011		
It has been observed from the commissioning certificates that, the date of commission for Vaayu Phase 2 in the monitoring report, are inconsistent with the commission dates mentioned in the Commissioning certificate. PP is requested to kindly clarify the same.						
<b>Project Participant Response:</b>				<b>Date:</b> 07/02/2012		
As per commissioning certificates of Vaayu Phase 2, the date of commissioning for location no 61, 86 and 85 is 25.09.2010. The same shall be corrected in revised Monitoring Report version 1.1.						
<b>Documentation Provided as Evidence by Project Participant:</b>						
MR ver 1.1 CER I 4677 50.4 MW						
<b>Information Verified by Lead Assessor:</b>						
MR ver 1.1 CER I 4677 50.4 MW						
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>				<b>Date:</b> 23/02/2012		
PP has not submitted the revised monitoring report with the said corrections. Thus, CAR#01 is open.						
<b>Project Participant Response:</b>				<b>Date:</b> 17/05/2012		
Monitoring report and emission reduction spreadsheet for the revised monitoring period from 25/04/2011 to 25/03/2012 (Including first and last day) have been submitted to DOE.						
<b>Documentation Provided as Evidence by Project Participant:</b>						
4677 MR ver 1.1						
4677 ER Cal Sheet ver 1.1						
<b>Information Verified by Lead Assessor:</b>						
4677 MR ver 1.1 dated 17.05.2012						
4677 ER Cal Sheet ver 1.1						
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>						
PP has corrected the date of commission for Vaayu Phase 2 in revised MR; revised MR version 1.1 dated 17.05.2012 has been cross checked with the commissioning certificates and found correct. Thus, CAR#01 is closed						
<b>Acceptance and Close out by Lead Assessor:</b>				<b>Date:</b> 25/05/2012		

Date:	13/12/2011	Raised by:	Assessment Team		
Type:	CAR	Number:	02	Reference:	AU4/MR
<b>Lead Assessor Comment:</b>			<b>Date:</b> 13/12/2011		
It has been observed from the JMR, that the JMR (Joint Meter Reading) statement of September 2011 ( for Phase 1, 4 & 7) which mentions the electricity generation from 25/08/2011 to 25/09/2011 , whereas the end date of the current MP is 26/09/2011. So, PP is requested to kindly correct the end date of the monitoring period in line to the JMR.					
<b>Project Participant Response:</b>			<b>Date:</b> 07/02/2012		
The JMR (Joint Meter Reading) statement for September 2011 (Phase 1, 4 & 7) records the electricity generation from 25/08/2011 to 25/09/2011. Now, the end date of the revised monitoring period shall be in-line to the JMR. PP requests the DOE to revise the dates of monitoring period as explained in PP's response of CAR 04.					
<b>Documentation Provided as Evidence by Project Participant:</b>					
MR ver 1.1 CER I 4677 50.4 MW					
<b>Information Verified by Lead Assessor:</b>					
MR ver 1.1 CER I 4677 50.4 MW					
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>			<b>Date:</b> 23/02/2012		
The CAR is open as the PP has not submitted the revised & correct monitoring report. Thus, CAR#02 is open.					
<b>Project Participant Response:</b>			<b>Date:</b> 17/05/2012		
Since the request to change the end dates of monitoring period has been approved, PP submit monitoring report and emission reduction spreadsheet for the revised monitoring period from 25/04/2011 to 25/03/2012 (Including first and last day).					
<b>Documentation Provided as Evidence by Project Participant:</b>					
4677 MR ver 1.1					
4677 ER Cal Sheet ver 1.1					
<b>Information Verified by Lead Assessor:</b>					
Revised MR version 1.1 dated 17/05/2012					
Revised Emission reduction sheet					
JMRs from April 2011 to March 2012					
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>					
As requested by the PP for extension in monitoring period, the assessment team agreed for extension in monitoring period and the monitoring period extended till 25/03/2012. PP has also provided the revised MR and revised ER sheet with corrected dates. It has been checked by the assessment team and found that the current monitoring period dates are consistent with the dates mentioned in JMR sheets. Thus, CAR#02 is closed					
<b>Acceptance and Close out by Lead Assessor:</b>			<b>Date:</b> 25/05/2012		

Date:	13/12/2011		Raised by:	Assessment Team	
Type:	CAR	Number:	03	Reference:	AU4/MR
<b>Lead Assessor Comment:</b>				<b>Date:</b> 13/12/2011	
<p>(a) From MR, version 1, it has been observed that for Vaayu (India) Power Corporation Private Limited (Phase-2), the calibration due date is 24/09/2011, whereas the current monitoring period is up to 26/09/2011, and there are no details for the current calibration for this meter. Thus, PP is requested to kindly justify the delay in the calibration in line to EB 52, Annex 60. Moreover, it has been observed from the calibration certificates that there is inconsistency in the calibration dates for Vaayu Phase -2 in the Monitoring report as well as in the CER spreadsheet. PP is requested to kindly clarify the same.</p> <p>(b) PP is requested to kindly include the complete calibration details in the monitoring report in particular, under section C &amp; section D. Moreover, same information has to be included in the spreadsheet.</p> <p>(c) PP is requested to kindly justify the gap in the calibrations for the substation bulk meters, since some delay / gap has been observed in the calibration of the sub station meters. The MR indicates the calibration of Vaayu (India) Power Corporation Private Limited (Phase-1, Phase 4 and Phase 7), main &amp; check meters on 03/08/2011, whereas the MP starts from 25/04/2011 and for Vaayu (India) Power Corporation Private Limited (Phase-2, Phase 3, Phase 5 and Phase 6), main &amp; check meters on 26/08/2011 whereas the MP starts from 25/04/2011.</p> <p>(d) PP is requested to kindly provide the calibration certificates for WTGs for the Vaayu (India) Power Corporation Private Limited (Phase-1).</p>					
<b>Project Participant Response:</b>				<b>Date:</b> 07/02/2012	
<p>(a) The Correction factor (0.2%) due to delay in calibration activity for Vaayu Phase -2 has been applied appropriately. The calibration date for Vaayu Phase -2 is 29/07/2010. Typographical error in calibration dates for Vaayu Phase -2 has been corrected in revised Monitoring report version 1.1 and CER spreadsheet version 1.1.</p> <p>(b) The complete calibration details have now been incorporated under section C, section D of Monitoring report and spreadsheet.</p> <p>(c) Since there is a gap in calibrations of substation bulk meters, appropriate correction factors shall be applied accordingly due to delay in calibration activity in accordance with EB 52, Annex 60. The same has been incorporated in revised Monitoring report version 1.1 and CER spreadsheet version 1.1.</p> <p>(d) The calibration certificates for WTGs for the Vaayu (India) Power Corporation Private Limited (Phase-1) shall be provided along with revised Monitoring report version 1.1.</p>					
<b>Documentation Provided as Evidence by Project Participant:</b>					
MR ver 1.1 CER I 4677 50.4 MW					
ER Cal Sheet ver 1.1 CER I 4677 50.4 MW					
<b>Information Verified by Lead Assessor:</b>					
MR ver 1.1 CER I 4677 50.4 MW					
ER Cal Sheet ver 1.1 CER I 4677 50.4 MW					
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>				23/02/2012	
The CAR is open as the PP has not submitted the revised & correct monitoring report. Thus, CAR#03 is open.					
<b>Project Participant Response:</b>				<b>Date:</b> 17/05/2012	

(a) In accordance with the guidelines for assessing compliance with the calibration frequency requirements and applicable national guidelines for calibration/testing of energy meters, PP request EB to approve the revision in monitoring plan (RMP), in particular change in calibration/testing frequency from once each year to once in five years. Therefore, current meter calibration certificates will remain valid during first monitoring period. Moreover, The calibration date for Vaayu Phase -2 is 29/07/2010 as per calibration certificate. Typographical error in calibration dates for Vaayu Phase -2 has been corrected in revised Monitoring report version 1.1 and CER spreadsheet version 1.1.

(b) The complete calibration details has now been incorporated under section C, section D of revised monitoring report version 1.1 and CER spreadsheet version 1.1.

(c) In accordance with the guidelines for assessing compliance with the calibration frequency requirements and applicable national guidelines for calibration/testing of energy meters, PP request EB to approve the revision in monitoring plan (RMP), in particular change in calibration/testing frequency from once each year to once in five years. Therefore, first meter calibration certificates will remain valid during current monitoring period.

(d) The calibration certificates for WTGs for the Vaayu (India) Power Corporation Private Limited (Phase-1) is provided to DOE.

**Documentation Provided as Evidence by Project Participant:**

*4677 MR ver 1.1*

*4677 ER Cal Sheet ver 1.1*

*Revised PDD version 05*

**Information Verified by Lead Assessor:**

- Revised MR version 1.1 dated 17/05/2012
- Revised ER sheet
- Latest calibration certificates for all the meters involved in the project activity.
- CEA Metering Regulations [section 18 subsection 1 (b)]
- PPA Article 4 Vaayu Andhra
- PP Calibration Request Letters

**Reasoning for not Acceptance or Acceptance and Close Out:**



- a. As the methodology doesn't specify the calibration requirement of the energy meters. As per the registered PDD PP was supposed to conduct the calibration of the meters at least once in a year. However, it is not under control of the PP to carry out the calibration once in a year, because calibration/ testing of the meters will be done by the state electricity board for all the WTGs connected on same meters. Further as per national regulations on installation and operation of meters in accordance with section 18 subsection 1 (b), Calibration and periodical testing of meters by Central Electricity Authority (CEA) of India; the energy meters shall be calibrated and tested once in five year. Thus, PP requested revision in monitoring period on this concern and the same is acceptable as per the revised Monitoring plan. Furthermore, calibration date of the phase 2 has been corrected. It has been checked with the calibration certificate and found correct. CLOSED
- b. As per the revised monitoring plan the calibration of the energy meters shall be carried out once in a five year and the same has been included in the section C and D of the revised MR. It has been checked and found correct. CLOSED
- c. As per national regulations on installation and operation of meters in accordance with section 18 subsection 1 (b), Calibration and periodical testing of meters by Central Electricity Authority (CEA) of India; the energy meters shall be calibrated and tested once in five year. Thus, PP requested revision in monitoring period on this concern and the same is acceptable as per the revised Monitoring plan. CLOSED
- d. The calibration certificate for the WTG of Phase-1 has been checked by the assessment team and found consistent with the date mentioned in the MR. CLOSED

Thus, CAR#03 is closed

<b>Acceptance and Close out by Lead Assessor:</b>	<b>Date:</b> 25/05/2012
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Date:	13/12/2011	Raised by:	Assessment Team
Type:	CAR	Number:	04
		Reference:	AU4/MR
<b>Lead Assessor Comment:</b>		<b>Date:</b> 13/12/2011	
From the monitoring report, version1, it has been observed that the quantum of CERs in the current monitoring period has been increased substantially (77%) as compared to the estimated CERs in the registered PDD.PP is requested to kindly justify the reason for the increase in the CERs.			
<b>Project Participant Response:</b>		<b>Date:</b> 07/02/2012	
Wind power generation in India is characterized by high and low wind seasonal variation. Present monitoring period covers complete high wind seasonal variation (May to September) for the project site. Therefore, the difference in the total CERs is due to high plant load factor during the monitoring period. However, in order to demonstrate robustness of PLF, it is felt necessary that complete wind cycle for the project site should be captured. Hence, PP requests DOE to consider extending the monitoring period till March 2012 so that the robustness of PLF assumed in PDD is demonstrated transparently for a cycle including lean as well as peak wind season.			
<b>Documentation Provided as Evidence by Project Participant:</b>			
MR ver 1.1 CER I 4677 50.4 MW			
ER Cal Sheet ver 1.1 CER I 4677 50.4 MW			
<b>Information Verified by Lead Assessor:</b>			
MR ver 1.1 CER I 4677 50.4 MW			
ER Cal Sheet ver 1.1 CER I 4677 50.4 MW			
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>		<b>Date:</b> 23/02/2012	
The CAR is open as the PP has not submitted the revised & correct monitoring report & spreadsheet. Thus, CAR#04 is open.			



<b>Project Participant Response:</b>	<b>Date: 17/05/2012</b>
<p>Since the request to change the end dates of monitoring period has been approved, PP submit monitoring report and Emission reduction spreadsheet for the revised monitoring period from 25/04/2011 to 25/03/2012 (Including first and last day).</p> <p>As per revised monitoring period, the estimated annual emission reductions in the registered PDD for the changed monitoring period are 85,330 tCO<sub>2</sub>e. The actual emission reductions are 93,324 which are more than the estimated emission reduction. There is change of 9.37 % (upside) in the expected and annual emission reductions. Present monitoring period covers 11 months generation and does not cover the one month generation data which belongs to lean wind season. Therefore, the reason for more CERs is high PLF in high wind season of year during the monitoring period which is also covered under the sensitivity analysis done in registered PDD. Moreover, wind power generation in India is characterized by seasonal variation (peak, off peak and lean wind season) and yearly variation (with the difference of good-wind year, average year, and poor-wind year).</p>	
<b>Documentation Provided as Evidence by Project Participant:</b>	
4677 MR ver 1.1	
4677 ER Cal Sheet ver 1.1	
<b>Information Verified by Lead Assessor:</b>	
Revised MR version 1.1 dated 17/05/2012	
Revised ER sheet	
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>	
<p>Initially PP has considered the monitoring period from April to September 2011, which covers complete high wind seasonal variation (May to September) for the project site. Therefore, the difference in the total CERs is due to high plant load factor during the monitoring period. However, PP requested to extend the monitoring period till March 2012. PP has also provided the revised MR and revised ER sheet with corrected dates. It has been checked by the assessment team and found that the estimated annual emission reductions in the registered PDD for the changed monitoring period are 85,330 tCO<sub>2</sub>e. The actual emission reductions are 93,324 which are more than the estimated emission reduction. There is around 18 % increment found in PLF for current monitoring period. Ex-ante PLF estimated 22.28 %, while PLF observed for current monitoring period is 24 %. However, it was assessed at the time of validation that at 37.03 % the equity IRR crosses the benchmark.</p> <p>Thus, assessment team agreed for the extension in the monitoring Period in line with the guideline outlined under paragraph 78 of EB 41.. Thus, CAR#04 is closed</p>	
<b>Acceptance and Close out by Lead Assessor:</b>	<b>Date: 25/05/2012</b>

Date:	13/12/2011	Raised by:	Assessment Team		
Type:	CAR	Number:	05	Reference:	AU4/MR
<b>Lead Assessor Comment:</b>				<b>Date:</b> 13/12/2011	
From the monitoring report, version1, it has been observed that all the values for “ <b><i>Electricity exported to grid after apportioning of transmission losses</i></b> ” are not found to be consistent with the JMR sheet. PP is requested to kindly correct the same.					
<b>Project Participant Response:</b>				<b>Date:</b> 07/02/2012	
<i>The values for “Electricity exported to grid after apportioning of transmission losses” are revised now as per JMR sheet. Typographic error has been regretted. The same shall be corrected in revised monitoring report version 1.1 and ER calculation spread sheet version 1.1.</i>					
<b>Documentation Provided as Evidence by Project Participant:</b>					
MR ver 1.1 CER I 4677 50.4 MW					
ER Cal Sheet ver 1.1 CER I 4677 50.4 MW					
<b>Information Verified by Lead Assessor:</b>					

MR ver 1.1 CER I 4677 50.4 MW	
ER Cal Sheet ver 1.1 CER I 4677 50.4 MW	
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>	<b>Date:</b> 23/02/2012
The CAR is open as the PP has not submitted the revised & correct monitoring report & spreadsheet. Thus, CAR#05 is open.	
<b>Project Participant Response:</b>	<b>Date:</b> 17/05/2012
<i>Since the request to change the end dates of monitoring period has been approved, PP submit monitoring report and emission reduction spreadsheet for the revised monitoring period from 25/04/2011 to 25/03/2012 (Including first and last day).</i>	
<b>Documentation Provided as Evidence by Project Participant:</b>	
4677 MR ver 1.1	
4677 ER Cal Sheet ver 1.1	
<b>Information Verified by Lead Assessor:</b>	
Revised MR version 1.1 dated 17/05/2012	
Revised ER sheet	
JMR sheets	
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>	
All the values of the Electricity exported to grid after apportioning of transmission losses for monitoring period 25/04/2011 to 25/03/2012 have been checked with the JMRs and found consistent. Thus, CAR#05 is closed.	
<b>Acceptance and Close out by Lead Assessor:</b>	<b>Date:</b> 25/05/2012

Date:	13/12/2011	Raised by:	Assessment Team
Type:	CAR	Number:	06
		Reference:	AU4/MR
<b>Lead Assessor Comment:</b>		<b>Date:</b> 13/12/2011	
From the monitoring report, version1, it has been observed that the values for "Electricity Import recorded at 33kV" for the month of July 2011( Phase 1, 2, 4 & 5) & August 2011( Phase 2, 3 & 6) are not matching with those of JMR values. PP is requested to kindly correct the same.			
<b>Project Participant Response:</b>		<b>Date:</b> 07/02/2012	
Electricity Import recorded at 33kV for the month of July 2011(Phase 1, 2, 4 & 5) & August 2011(Phase 2, 3 & 6) has been revised as per JMR values of these respective months. <i>The same shall be corrected in revised monitoring report version 1.1 and ER calculation spread sheet version 1.1.</i>			
<b>Documentation Provided as Evidence by Project Participant:</b>			
MR ver 1.1 CER I 4677 50.4 MW			
ER Cal Sheet ver 1.1 CER I 4677 50.4 MW			
<b>Information Verified by Lead Assessor:</b>			
MR ver 1.1 CER I 4677 50.4 MW			
ER Cal Sheet ver 1.1 CER I 4677 50.4 MW			
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>		<b>Date:</b> 23/02/2012	
The CAR is open as the PP has not submitted the revised & correct monitoring report & spreadsheet. Thus, CAR#06 is open.			
<b>Project Participant Response:</b>		<b>Date:</b> 17/05/2012	

<p><i>Since the request to change the end dates of monitoring period has been approved, PP submit monitoring report and emission reduction spreadsheet for the revised monitoring period from 25/04/2011 to 25/03/2012 (Including first and last day).</i></p>	
<p><b>Documentation Provided as Evidence by Project Participant:</b></p> <p>4677 MR ver 1.1</p> <p>4677 ER Cal Sheet ver 1.1</p>	
<p><b>Information Verified by Lead Assessor:</b></p> <p>Revised MR version 1.1 dated 17/05/2012</p> <p>Revised ER sheet</p> <p>JMR sheets</p>	
<p><b>Reasoning for not Acceptance or Acceptance and Close Out:</b></p> <p>All the Values of Electricity Import recorded at 33kV have been checked with the JMR for the monitoring period 25/04/2011 to 25/03/2012 have been checked with the JMRs and found consistent. However, values of Electricity Export recorded at 132 Kv (kWh) for the month of January 2012 (Phase-2, Phase-3, Phase-5, Phase-6,) are not matching with the JMRs. Correction is required. OPEN</p>	
<p><b>Project Participant Response:</b></p> <p>Electricity Export recorded at 132 Kv (kWh) for the month of January 2012 (Phase-2, Phase-3, Phase-5 and Phase-6) has been revised as per JMR values of these respective months. The same has been corrected in revised monitoring report version 1.2 and ER calculation spread sheet version 1.2.</p>	<p><b>Date: 01/06/2012</b></p>
<p><b>Documentation Provided as Evidence by Project Participant:</b></p> <p>4677 MR Version 1.2 VVS Track</p> <p>4677 ER Cal Sheet ver 1.2</p> <p>Revised PDD, version 5</p>	
<p><b>Information Verified by Lead Assessor:</b></p> <p>4677 MR Version 1.2 VVS Track</p> <p>4677 ER Cal Sheet ver 1.2</p>	
<p><b>Reasoning for not Acceptance or Acceptance and Close Out:</b></p> <p>The revised MR version 1.2 VVS Track and the revised emission reduction sheet have been checked by the assessment team and found the values of Electricity Export recorded at 132 Kv (kWh) for the month of January 2012 (Phase-2, Phase-3, Phase-5, Phase-6,) have been changed according to the JMR. However, some of the issues were identified later regarding the emission reduction calculations as mentioned below. Correction is requested</p> <ul style="list-style-type: none"> <li>• Annual estimated ER is estimated for 335 days but current monitoring period contains 336 days.</li> <li>• Value of <b>E<sub>Ge</sub></b> is constant for few months or same for few phases for particular months. Correction is requested from PP.</li> <li>• Some of the cells showing error (Generation details) in emission reduction sheet. PP is requested to mention the correct values of estimated ER for current MP as per registered PDD</li> </ul> <p>Thus, CAR#06 is open</p>	<p><b>Date – 09/07/2012</b></p>
<p><b>Project Participant Response:</b></p>	<p><b>Date:13/07/2012</b></p>

<ul style="list-style-type: none"> <li>Error in annual estimation of ER is corrected. ER sheet has been revised as current monitoring period contains 336 days.</li> <li>Electricity export to the grid (<b>EGe</b>) is directly taken from joint meter reading sheets (JMRs) recorded at 132 KV of the ENERCON pooling substation (Bulk metering point). Every month, the value of <b>EGe</b> is constant for phases which are connected to single metering points. The same is also evident from transmission loss calculations sheet of JMR reports of each month. The presentation EGe values has been revised ER calculation sheet.</li> <li>Since some cells were showing error (Generation details) in emission reduction sheet, PP has taken conservative round down values of electricity exported to grid after apportioning of transmission Losses. PP has revised estimated emission reductions for current MP as per registered PDD.</li> </ul>	
<b>Documentation Provided as Evidence by Project Participant:</b>	
4677 MR Version 1.3 VVS Track 4677 ER Cal Sheet ver 1.3	
<b>Information Verified by Lead Assessor:</b>	
4677 MR Version 1.3 VVS Track for the annual estimated emission reductions 4677 ER Cal Sheet ver 1.3 for the generation details	
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>	
<ul style="list-style-type: none"> <li>The revised calculation of annual estimated ER for 336 days (Current monitoring period) has been included. The revised MR and emission reduction sheet have been checked and found correct. CLOSED</li> <li>The value of EGe is recorded at 132 kV meters (main and check) at ENERCON pooling substation connecting machines of the project activity and machines commissioned by the other project developers. Thus, the reading would same for all the phases connected on same metering point. This value is used to calculate the net electricity supplied to the grid by each phase. Further, all the Vaayu phases were connected to single 132 KV bulk metering point at sub-station during the month of May, 2011. Due to increase in connected load at sub-station, two 132 KV bulk metering point were used to measure electricity generation from the month June, 2011 onwards. However, this does not impact overall emission reductions during the current monitoring period. CLOSED</li> <li>All the values in the revised emission reduction sheet have been rounded down. The revised emission reduction sheet has been checked by the assessment team and found that there is no error in the cells showing error (Generation details). CLOSED</li> </ul> <p>Thus, CAR#06 is closed</p>	
<b>Acceptance and Close out by Lead Assessor:</b>	<b>Date:</b> 16/07/2012

Date:	13/12/2011		Raised by:	Assessment Team		
Type:	CAR	Number:	07		Reference:	AU4/MR
Lead Assessor Comment:				Date: 25/05/2012		
As per the para 5 (a) of Appendix 1 of the Project Standard (EB 65 Annex 5), the prior approval is not required for the change of calibration frequency for monitoring equipment which is not under control of PP. Thus, RMP and request for issuance shall be submitted simultaneously. PP is requested to provide the revised monitoring plan in the latest template available as per the VVS Track.						
Project Participant Response:				Date: 01/06/2012		
PP has revised monitoring report in accordance with latest template available in VVS Track standard.						
Documentation Provided as Evidence by Project Participant:						
4677 MR Version 1.2 VVS Track						

<b>Information Verified by Lead Assessor:</b>	
4677 MR Version 1.2 VVS Track	
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>	
PP has revised the monitoring report in accordance with the latest template available in VVS Track. It has been checked by the assessment team and found that the all the requirements of the template mentioned in the revised MR version 1.2. Thus, CAR#07 is closed	
<b>Acceptance and Close out by Lead Assessor:</b>	<b>Date:</b> 04/06/12

Date:	21/05/2012		Raised by:	Assessment Team	
Type:	CAR	Number:	08	Reference:	AU4
<b>Lead Assessor Comment:</b>				<b>Date:</b> 21/05/2012	
As revision in monitoring plan proposed by the PP that the calibration frequency of the energy meters used in the project activity would not be as per the registered PDD. The calibration frequency would be once in a five year as per national regulations on installation and operation of meters in accordance with section 18 subsection 1 (b), <b>Calibration and periodical testing of meters</b> by Central Electricity Authority (CEA) of India. However, PP is requested to provide the explanation that, why the calibration and testing could not be possible at the frequency prescribed in the registered PDD.					
<b>Project Participant Response:</b>				<b>Date:</b> 22/05/2012	
As per registered PDD, the accuracy of monitoring parameter is ensured by adhering to the calibration and testing of the metering equipment once each year and the calibration is done by the officials of the state utility.					
<i>Hence, calibration and testing of meters cannot be conducted solely by the project proponent as per provisions of the power purchase agreement (PPA). As per article 4 of the PPA, the energy meters shall be jointly inspected and sealed on behalf of both parties (state utilities and the PP) and shall not be interfered with except in the presence of representatives of both the parties. Therefore meter calibration and testing is not solely in control of the PP.</i>					
<i>Further as per article 4 of the PPA, the PP is not provided with the authority to conduct or appoint the third party for calibration/testing of the energy meters and therefore have to rely on the state utility for conducting calibration/testing of the energy meters.</i>					
<i>The PP can request the state utilities to conduct the calibration/testing of the energy meters at the scheduled time but cannot by any means force the state utilities to conduct the calibration/testing.</i>					
<i>Enercon (India) Limited (O&amp;M contractor) on behalf of PP has requested the state utilities for calibration of meters through letters dated 10 February 2011, 29 November, 2011 and 07 December 2011. However, no formal response has been provided by the state utilities. Therefore adhering to calibration /testing frequency of once in each year by the PP is not possible.</i>					
<i>The applied methodology ACM0002 version 11 does not specify any specific time period for conducting the calibration/testing of the equipment. Further as per national regulations on installation and operation of meters in accordance with section 18 subsection 1 (b), Calibration and periodical testing of meters by Central Electricity Authority (CEA) of India; the energy meters shall be calibrated and tested once in five year. Therefore the proposed revision is as per approved methodology and level of accuracy and completeness in the monitoring and verification process is not reduced as a result of the revision. There is no impact on the calculation of the emission reductions as a result of change in frequency of the calibration/testing of the energy meters and therefore accuracy of emission reductions is not reduced as a result of proposed revision.</i>					
<b>Documentation Provided as Evidence by Project Participant:</b>					

CEA Metering Regulations [section 18 subsection 1 (b)] PPA Article 4 Vaayu Andhra PP Calibration Request Letters Vaayu Andhra PDD ver 5.0	
<b>Information Verified by Lead Assessor:</b>	
CEA Metering Regulations [section 18 subsection 1 (b)] PPA Article 4 Vaayu Andhra PP Calibration Request Letters Vaayu Andhra PDD ver 5.0	
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>	
As calibration and testing of meters cannot be conducted solely by the project proponent as per provisions of the power purchase agreement (PPA). As per article 4 of the PPA, the energy meters shall be jointly inspected and sealed on behalf of both parties (state utilities and the PP) and shall not be interfered with except in the presence of representatives of both the parties. Further as per article 4 of the PPA, the PP is not provided with the authority to conduct or appoint the third party for calibration/testing of the energy meters and therefore have to rely on the state utility for conducting calibration/testing of the energy meters. Thus, it is found that the calibration and testing of the meters are not under control of PP. Additionally, The applied methodology ACM0002 version 11 does not specify any specific time period for conducting the calibration/testing of the equipment. Further as per national regulations on installation and operation of meters in accordance with section 18 subsection 1 (b), Calibration and periodical testing of meters by Central Electricity Authority (CEA) of India; the energy meters shall be calibrated and tested once in five year. The assessment team has checked the PPA, methodology and CEA metering regulations. [section 18 subsection 1 (b)) and found that it is accordance with the local/National standard (para 242 of the VVS). Thus, it is acceptable and the CAR#08 is closed.	
<b>Acceptance and Close out by Lead Assessor:</b>	<b>Date:</b> 04/06/2012

Date:	21/05/2012	Raised by:	Assessment Team		
Type:	CAR	Number:	09	Reference:	AU4
<b>Lead Assessor Comment:</b>				<b>Date:</b> 21/05/2012	
PP is requested to explain that, if the meters used in the project activity would not work properly and if it will go beyond the maximum permissible error as prescribed in the registered PDD, then how the emission reductions would be calculated.					
Also, PP is requested to clarify why the version and date of the revised PDD is not updated.					
<b>Project Participant Response:</b>				<b>Date:</b> 22/05/2012	
In case the main meter is found to operate outside the permissible limits of error but the check meter is found to be within the permissible limits of error, the main meter will be either replaced or calibrated immediately and the consumption recorded by the Check meter will be referred for calculation of emission reductions.					
If both the main meter and check meter are found to operate outside the permissible limits of error, both the meters shall be either replaced or calibrated immediately and consumption recorded by the main meter after applying full value of maximum permissible error will be referred for calculation of emission reductions.					
The same has been incorporated in revised PDD version 05.					
<b>Documentation Provided as Evidence by Project Participant:</b>					
Vaayu Andhra PDD ver 5.0					



<b>Information Verified by Lead Assessor:</b>	
<i>Vaayu Andhra PDD ver 5.0</i>	
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>	
<p>It has been clarified by the PP that, In case the main meter is found to operate outside the permissible limits of error but the check meter is found to be within the permissible limits of error, the main meter will be either replaced or calibrated immediately and the consumption recorded by the Check meter will be referred for calculation of emission reductions.</p> <p>If both the main meter and check meter are found to operate outside the permissible limits of error, both the meters shall be either replaced or calibrated immediately and consumption recorded by the main meter after applying full value of maximum permissible error will be referred for calculation of emission reductions. The revised PDD is checked by the assessment team and found that the calculation for the delayed calibration would be applied as per the EB 52 Annex 60.</p> <p>Thus, CAR#09 is closed</p>	
<b>Acceptance and Close out by Lead Assessor:</b>	<b>Date:</b> 04/06/2012

Date:	09/07/2012	Raised by:	Assessment Team		
Type:	CAR	Number:	10	Reference:	TR
<b>Lead Assessor Comment:</b>				<b>Date:</b> 09/07/2012	
<p><i>Some editorial changes need to be required in the MR as mentioned below</i></p> <ul style="list-style-type: none"> <li>Reference of the national standard used to change the calibration frequency not mentioned in B.2.3 of MR</li> <li>The link for the project standard mentioned in section B.2.3 of MR is not working</li> <li>Description of the parameters EGpe &amp; EGpi is not mentioned under section C of the MR</li> <li>Value of EGe mentioned under section D.2 of the MR is not consistent with ER sheet</li> <li>Reference of section/document where monthly values of <math>L_{ep}</math> reported is not mentioned under section D.2 of MR</li> <li>The calculation mentioned under section E.5 of the MR is not correct</li> </ul>					
<b>Project Participant Response:</b>				<b>Date:</b> 13/07/2012	
<ul style="list-style-type: none"> <li>Reference of the national standard used to change the calibration frequency has been provided in section B.2.3 of MR</li> <li>The web link for the project standard mentioned in section B.2.3 of MR has been revised.</li> <li>Description of the parameters EGpe &amp; EGpi are now explained under section C of the MR</li> <li>Value of EGe mentioned under section D.2 of the MR has been revised in accordance with ER sheet</li> <li>Reference of section/document where monthly values of <math>L_{ep}</math> reported is provided under section D.2 of MR</li> <li>The calculations provided in section E.5 of the MR has been revised in ER sheet.</li> </ul>					
<b>Documentation Provided as Evidence by Project Participant:</b>					
<i>4677 MR Version 1.3 VVS Track 4677 ER Cal Sheet ver 1.3</i>					
<b>Information Verified by Lead Assessor:</b>					
<i>4677 MR Version 1.3 VVS Track is checked for all the necessary corrections. 4677 ER Cal Sheet ver 1.3 is checked for revised calculation</i>					
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>				<b>Date:</b> 16/07/2012	

- Reference of the national standard which allows the calibration frequency 5 years has been included as footer 1 in the revised MR Version 1.3. it has been checked by the assessment team and found correct. CLOSED
- The web link for the project standard mentioned has been revised under section B.2.3 of revised MR. it has been checked and found working. CLOSED
- Description of the parameters EGpe & EGpi has been included under section C of the MR. it has been checked and found in line with the registered monitoring plan. CLOSED
- Value of EGe mentioned under section D.2 of the MR has been revised. It has been checked by the assessment team and found consistent throughout the documentation. CLOSED
- The calculation for the Lep is described under section C of the monitoring report. The monthly values of Lep have been provided as appendix 4 of the monitoring report. Same reference has been mentioned under section D.2 of the revised MR version 1.3. The values of Lep are directly sourced from the JMR. CLOSED
- The calculations provided in section E.5 of the MR has been revised for 336 days (Current monitoring period. It has been checked by the assessment team and found correct. CLOSED

Thus, CAR#10 is closed

**Acceptance and Close out by Lead Assessor:**

**Date:** 16/07/2012



## 10. Statement of Competence

Name: NAYAN JYOTI DEKA

### Status

- Lead Assessor	<input checked="" type="checkbox"/>	- Expert	<input checked="" type="checkbox"/>
- Assessor	<input checked="" type="checkbox"/>	- Financial Expert	<input type="checkbox"/>
- Local Assessor	<input checked="" type="checkbox"/>	- Technical Reviewer	<input checked="" type="checkbox"/>

### Scopes of Expertise

#### 1. Energy Industries (renewable / non-renewable)

☒

Technical Area(s):

TA 1.1 Thermal energy generation from fossil fuels and biomass

TA 1.2 Energy generation from renewable energy sources

#### 2. Energy Distribution

Technical Area(s):

#### 3. Energy Demand

Technical Area(s):

#### 4. Manufacturing

Technical Area(s):

#### 5. Chemical Industry

Technical Area(s):

#### 6. Construction

Technical Area(s):

#### 7. Transport

Technical Area(s):

#### 8. Mining/Mineral Production

Technical Area(s):

#### 9. Metal Production

Technical Area(s):

#### 10. Fugitive Emissions from Fuels (solid, oil and gas)

Technical Area(s):

#### 11. Fugitive Emissions from Production and

Consumption of Halocarbons and Sulphur Hexafluoride

Technical Area(s):

#### 12. Solvent Use

Technical Area(s):

#### 13. Waste Handling and Disposal

Technical Area(s):

#### 14. Afforestation and Reforestation

Technical Area(s):

#### 15. Agriculture

Technical Area(s):

Approved Member of Staff by:

Siddharth  
Yadav

Date:

20/07/2012

## Statement of Competence

Name: **Ajay Singh Thakur**

### Status

- Lead Assessor	<b>x</b>	- Expert	<b>x</b>
- Assessor	<b>x</b>	- Financial Expert	
- Local Assessor	<b>India</b>	- Technical Reviewer	

### Scopes of Expertise

<b>1. Energy Industries (renewable / non-renewable)</b>	<b>x</b>
Technical Area(s): TA 1.2 Energy generation from renewable energy sources	
<b>2. Energy Distribution</b>	
Technical Area(s):	
<b>3. Energy Demand</b>	
Technical Area(s):	
<b>4. Manufacturing</b>	
Technical Area(s):	
<b>5. Chemical Industry</b>	
Technical Area(s):	
<b>6. Construction</b>	
Technical Area(s):	
<b>7. Transport</b>	
Technical Area(s):	
<b>8. Mining/Mineral Production</b>	
Technical Area(s):	
<b>9. Metal Production</b>	
Technical Area(s):	
<b>10. Fugitive Emissions from Fuels (solid, oil and gas)</b>	
Technical Area(s):	
<b>11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride</b>	
Technical Area(s):	
<b>12. Solvent Use</b>	
Technical Area(s):	
<b>13. Waste Handling and Disposal</b>	
Technical Area(s):	
<b>14. Afforestation and Reforestation</b>	
Technical Area(s):	
<b>15. Agriculture</b>	
Technical Area(s):	

Approved Member of Staff by: **Siddharth Yadav** Date: **17/07/2012**

## Statement of Competence

Name: Ahmed  
Rekibuddin

### Status

- Lead Assessor		- Expert	
- Assessor		- Financial Expert	
- Local Assessor	India	- Technical Reviewer	

### Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	
Technical Area(s):	
2. Energy Distribution	
Technical Area(s):	
3. Energy Demand	
Technical Area(s):	
4. Manufacturing	
Technical Area(s):	
5. Chemical Industry	
Technical Area(s):	
6. Construction	
Technical Area(s):	
7. Transport	
Technical Area(s):	
8. Mining/Mineral Production	
Technical Area(s):	
9. Metal Production	
Technical Area(s):	
10. Fugitive Emissions from Fuels (solid, oil and gas)	
Technical Area(s):	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	
Technical Area(s):	
12. Solvent Use	
Technical Area(s):	
13. Waste Handling and Disposal	
Technical Area(s):	
14. Afforestation and Reforestation	
Technical Area(s):	
15. Agriculture	
Technical Area(s):	

Approved Member of Staff by: Siddharth Yadav Date: 27/03/2012

## Statement of Competence

Name: Ravi Kant  
Soni

### Status

- Lead Assessor	x	- Expert	x
- Assessor	x	- Financial Expert	
- Local Assessor	India	- Technical Reviewer	x

### Scopes of Expertise

#### 1. Energy Industries (renewable / non-renewable)

x

Technical Area(s): TA 1.2 Energy generation from renewable energy sources

#### 2. Energy Distribution

Technical Area(s):

#### 3. Energy Demand

Technical Area(s):

#### 4. Manufacturing

Technical Area(s):

#### 5. Chemical Industry

Technical Area(s):

#### 6. Construction

Technical Area(s):

#### 7. Transport

Technical Area(s):

#### 8. Mining/Mineral Production

Technical Area(s):

#### 9. Metal Production

Technical Area(s):

#### 10. Fugitive Emissions from Fuels (solid, oil and gas)

Technical Area(s):

#### 11. Fugitive Emissions from Production and

Consumption of Halocarbons and Sulphur Hexafluoride

Technical Area(s):

#### 12. Solvent Use

Technical Area(s):

#### 13. Waste Handling and Disposal

Technical Area(s):

#### 14. Afforestation and Reforestation

Technical Area(s):

#### 15. Agriculture

Technical Area(s):

Approved Member of Staff by:

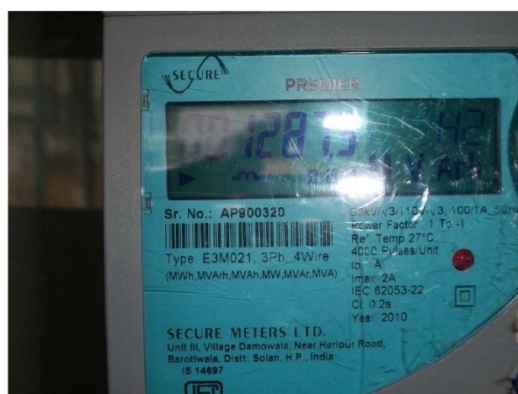
Siddharth  
Yadav

Date:

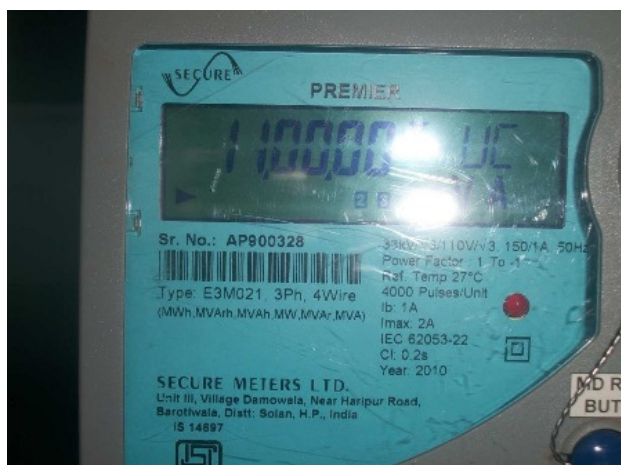
05/04/2012

## 11. Photographic Evidence

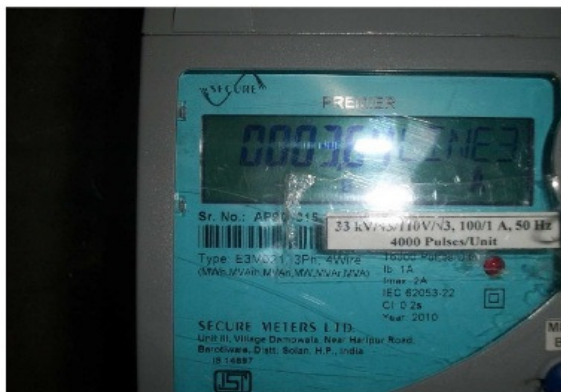
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Name of equipment: Main meter – AP900318 & Check meter - AP900320	Date: 15/05/2012



Unique reference number: Phase-2	Parameter: EGpe & EGpi
Name of equipment: Main meter – AP900327 & Check meter - AP900328	15/05/2012



Unique reference number: Phase -3	Parameter: EGpe & EGpi
Name of equipment: Main meter – AP900314 & Check meter - AP900315	Date: 15/05/2012



Unique reference number: Phase-4	Parameter: EGpe & EGpi
Name of equipment: Main meter – AP900338 & Check meter - AP900339	Date: 15/05/2012

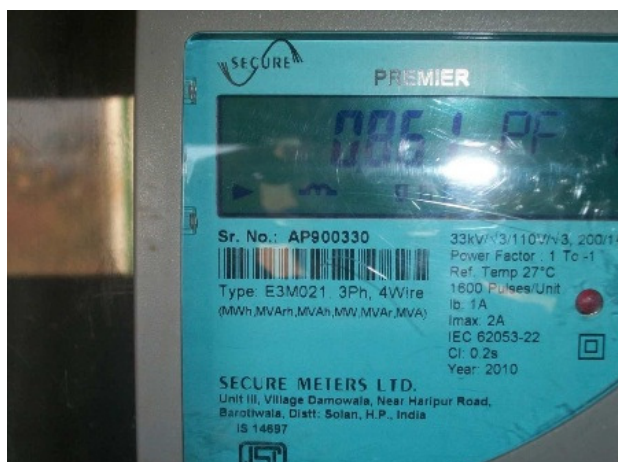


Unique reference number: Phase-5	Parameter: EGpe & EGpi
Name of equipment: Main meter – AP900319 & Check meter - AP900321	Date: 15/05/2012





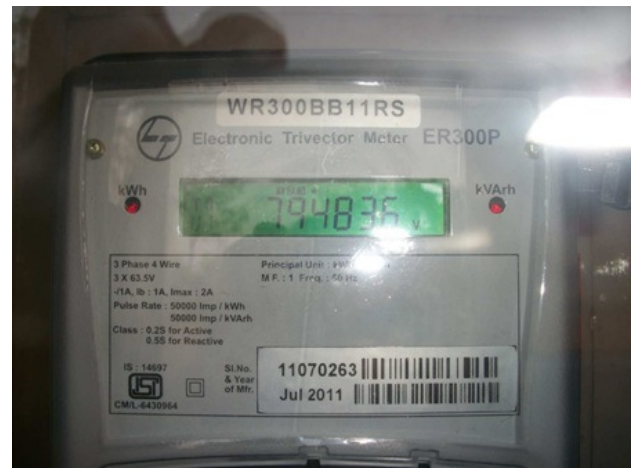
Unique reference number: Phase-6	Parameter: EGpe & EGpi
Name of equipment: Main meter – AP900329 & Check meter - AP900330	Date:15/05/2012



Unique reference number: Phase -7	Parameter: EGpe & EGpi
Name of equipment: Main meter – AP900331 & Check meter - AP900332	Date: 15/05/2012



Unique reference number: Phase -2, 3, 5 and 6	Parameter: EGe
Name of equipment: Main meter – 11070263 & Check meter -11070295	Date: 15/05/2012



Unique reference number: Phase-1, 4 and 7	Parameter: EGe
Name of equipment: Main meter – 5341444 & Check meter -10286994	Date: 15/05/2012







Sequence Number in Photograph (Left to Right)	Name/Position/Company
01	Ajay Singh Thakur- Assessor, SGS India
02	Nayan Jyoti Deka- Lead Assessor/ Expert TA-1.2 (Wind), SGS India
03	Navneet Kumar- Deputy Manager, Enercon India

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## History

Version	EB Requirement	Nature of revision	Validity
Issue 6	VVs Version 02.0	Update to checklist to include VVS procedures	25 <sup>th</sup> May 2012
Issue 5.4	VVM Version 01.2	Update to checklist	24 <sup>th</sup> February 2011