



Voluntary Carbon Standard 2007.1

Verification Report

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Verification Report:

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Report Title: Verification report - 17.45 MW Bundled Wind Power Project in India	Approved by: Mr. Winter Rainer
Client: J. P. Morgan Ventures Energy Corporation 270 Park Avenue, New York, New York, 10017 - 2014	Project Title: 17.45 MW Bundled Wind Power Project in India

VCS 2007.1 Verification Report – 17.45 MW Bundled Wind Power Project in India

Summary:

M/s. MITCON Consultancy Services Ltd. on behalf of J. P. Morgan Ventures Energy Corporation has commissioned the TÜV NORD JI/CDM Certification Program (formally UNFCCC accredited DOE) to carry out the verification of the project: "17.45 MW Bundled Wind Power Project in India", with regard to the relevant requirements of VCS 2007.1 Standard on demand^{/CON/}. The verifiers have reviewed the implementation of the monitoring plan (MP), for the VER project for the crediting Period 2007-06-01 to 2008-05-31 including both the days. The project activity involves generation of electricity using wind energy by Wind Turbine Generator (WTG) of gross 17.45 MW installed capacity located in Karnataka, Tamilnadu, Rajasthan and Maharashtra. Twenty four (24) number of WTG are installed at various locations in the states of Karnataka, Tamilnadu, Rajasthan and Maharashtra. The power generated is stepped up to synchronize with the grid requirements, metered, and evacuated to the respective Regional Grids.

A risk based approach has been followed to perform this verification. In the course of the verification 6 Corrective Action Requests (CAR) and 2 Clarification Requests (CR) were raised.

The verification is based on the monitoring report^{/MR/}, Validated PDD under VCS I^{/PDD/}, VCS Validation report^{/VAL/} and Verifications report^{/VAL/} and other supporting documents made available to the verifiers by the project proponent.

As a result of the verification, the verifiers confirm the following emission reductions:

Emission reductions:	CO₂ [tCO ₂]	CH₄ [t CH ₄]	N₂O [t N ₂ O]	HFCs [t HFC]	PFCs [t PFC]	SF₆ [t SF ₆]	Sum [tCO ₂ e]
2007	15,136	-	-	-	-	-	15,136
2008	8,804	-	-	-	-	-	8,804
TOTAL:							23,940

Work carried out by:

Number of pages:

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Report verified and approved by:

Mr. Rainer Winter, Approved CDM/JI Senior Assessor and In-charge of the JI/CDM certification program of TUV NORD.

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1 Introduction

1.1 Objective

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

- to verify that the project is implemented as described in the project design document;
- to confirm that the monitoring system is implemented and fully functional to generate voluntary carbon units (VCUs) without any double counting, and
- to establish that the data reported are accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emissions reduction calculation.

1.2 Scope and Criteria

The verification of this VCS project is based on the validated PDD^{/PDD/} registered under VCS-I, Validation report^{/VAL/} as per VCS-I guidelines, the monitoring report^{/MR/} and other supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment. Furthermore, publicly available information was considered as far as available and required.

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

1.3 VCS Project Description

The proposed project has a total installed capacity of 17.45 MW (> 15 MW) and therefore falls under large-scale methodology approved consolidated baseline & monitoring methodology ACM0002 (Version 06: 19 May 2006) of CDM. Additionally the VCS 2007.1 monitoring method is applicable for monitoring of electricity generation.

Twenty four (24) WTGs are installed at various locations in the states of Karnataka, Tamilnadu, Rajasthan and Maharashtra with below specifications.

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Tamilnadu (9 WTGs):

Name of Project Participant	No. of WTGs	Capacity (MW)
M/s. Vindhya Spinning Mills Private Limited (VSPML)	1	0.5
	1	0.6
M/s. Prima Papers & Engineering Pvt. Ltd (PPEPL)	1	0.25
	1	0.25
	1	0.25
	1	0.25
	1	0.25
M/s. Sarvana Spinning Mills(SSM)	1	0.6
M/s. Kumaragiri Textiles Ltd (KTL)	1	0.8

Karnataka (1 WTGs)

Name of Project Participant	No. of WTGs	Capacity (MW)
M/s. Rameshkumar Hanjarimal Rathod	1	1.25

Rajasthan (3 WTGs)

Name of Project Participant	No. of WTGs	Capacity (MW)
M/s. M J Associates (MJA)	1	0.35
M/s. Adarsha Gaur Gum Udyog (AGGU)	1	0.35
M/s. Fashion Apparels Pvt. Ltd. (FAPL)	1	0.35

Maharashtra (11 WTGs)

Name of Project Participant	No. of WTGs	Capacity (MW)
M/s. Rathi Dye Chem Pvt. Ltd (RDCPL)	1	0.6
M/s. Chhotabhai Jethabhai Patel & Co (CJPC)	1	1.5
M/s. Vijay S. Lodha (VSL)	1	0.6
M/s. Amar Associates (AA)	1	1.25
M/s. Hermes Electronics Pvt. Ltd. (HEPL)	1	1.25
M/s. Raj Infrastructure Developers (RID)	1	1.25
M/s. Hotel Sheetal (HS)	1	1.25
M/s. P. R. Patil (PRP)	1	1.25
	1	1.25
Preetam Enterprises (PE)	1	0.6
Shree Panchganga Agro Impex Pvt. Ltd (SPA IPL)	1	0.6

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The electricity generation from renewable sources (wind) is a carbon neutral energy input and intended to reduce CO₂ emissions to the extent of equivalent electricity displaced by fossil fuels dominated power plant in Western and Southern region grids of India. The estimated amount of emission reductions over the chosen 10-year "fixed crediting period" is **313623 tCO₂e** as per PDD^{/PDD/}. The electricity exported to the grid due to the project activity for the monitoring period 2007-06-01 to 2008-05-31 is **26,270,805 kWh**^{/XLS/} and the emission reductions over the monitoring period 2007-06-01 to 2008-05-31 are **23,940 tCO₂e**^{/MR/}.

The emission reduction is based on net electricity exported by the project activity from WTGs multiplied by the ex-ante emission factor. The resultant figure of grid emission factor¹ (in accordance with formula number (11) of AMS I.D.) are as below is deemed to be adequate, transparent as well as conservative.

Simple Operating Margin (tCO₂/MWh) (excl. Imports)

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
North	0.98	0.98	1.00	0.99	0.97	0.99
East	1.22	1.22	1.20	1.23	1.20	1.16
South	1.02	1.00	1.01	1.00	1.00	1.01
West	0.98	1.01	0.98	0.99	1.01	0.99
North-East	0.73	0.71	0.74	0.74	0.71	0.70
India	1.02	1.02	1.02	1.03	1.03	1.02

Build Margin (tCO₂/MWh) (excl. Imports)

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
North					0.53	0.60
East					0.90	0.97
South					0.71	0.71
West					0.77	0.63
North-East					0.15	0.15
India					0.70	0.68

Grid emission factor:

- Western Regional Grid (Maharashtra) – **0.905 T CO₂/MWh**
- Southern Regional Grid (Karnataka, Tamilnadu) – **0.930 T CO₂/MWh**
- Northern Regional Grid (Rajasthan) – **0.889 T CO₂/MWh**

¹ CO₂ Baseline Database, for the Indian Power Sector, Version 2.0, 21 June, 2007

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The net electricity exported by generated from WTG's is calculated from the difference of export and import values of electricity in accordance with the joint meter reading^{/JMR/} as per PDD validated under VCS-I and submitted monitoring plan. All these common meters are cumulative type and under periodic calibration by state electricity board^{/CAL/}.

The net electricity generated during the monitoring period 2007/06/01 to 2008/05/31 was **26.270** GWh^{/MR/}. This value is applied for calculation of emission reductions and is found to effect a reduction of **23,940** tCO₂e during the period.

1.4 Level of assurance

The verification report is based on validated PDD^{/PDD/} under VCS-I, monitoring report^{/MR/} and supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment. The verification opinion is assured through the credibility of all documents checked.

2 Methodology

The verification of the project was carried out from May, 2008 to April, 2009 after the contract dated 2008/05/16.

Preparations:	<i>From 2009-01-19 to 2009-01-21</i>
On-site verification:	<i>2009-01-22</i>
Draft Reporting:	<i>2009-02-07</i>
Final Reporting:	<i>2009-04-14</i>

The verification consisted of the following steps:

- A desk review of the PDD and supporting documents with the use of the relevant sections of a customised protocol according to the VCS 2007.1;
- A desk review of the Monitoring Report^{/MR/} and additional supporting documents which were submitted by the client. The relevant sections of the above mentioned customised protocol according to the VCS 2007.1 were used.
- Verification audit planning,
- On-Site assessment,

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- Background investigation and follow-up interviews with personnel of the project developer,
- Verification reporting (Draft Verification Report and Final Verification Report).

The criteria of this verification include the relevant rules and steps as set out in the VCS.

3 Verification Findings

3.1 Project Implementation

The proposed project involves generation of electricity using wind energy by Wind Turbine Generator (WTG) with installed capacity of the project is 17.45 MW located in Karnataka, Tamilnadu, Rajasthan and Maharashtra. Twenty Fourteen (24) number of WTGs spread across various locations in the states of Karnataka, Tamilnadu, Rajasthan and Maharashtra. The details of the project location are tabulated below:

Name of the Sponsor	Village / Taluka	District	Latitude	Longitude	State
Vindhya Spinning Mills Private Limited (VSPML)	Eladhur	Tirunelveli	08° 10' N	77° 26' E	Tamilnadu
	Mangalam	Tirunelveli	08° 10' N	77° 26' E	Tamilnadu
Rameshkumar Hanjarimal Rathod (RHR)	Kappathguda	Gadag	14° 14' N	76° 24' E	Karnataka
Prima Papers & Engineering Pvt. Ltd (PPEPL)	Kurungulum	Tirunelveli	74° 19' E	20° 59' N	Tamilnadu
	Kurungulum	Tirunelveli	08° 10' N	77° 26' E	Tamilnadu
	Pazahoor	Tirunelveli	08° 10' N	77° 26' E	Tamilnadu
	Kurungulum	Tirunelveli	08° 10' N	77° 26' E	Tamilnadu
	Kurungulum	Tirunelveli	08° 10' N	77° 26' E	Tamilnadu
Rathi Dye Chem Pvt. Ltd (RDCPL)	Garjewadi	Sangli	16° 52' N	74° 34' E	Maharashtra
Sarvana Spinning Mills (SSM)	Penagudi	Tirunelveli	08° 10' N	77° 26' E	Tamilnadu
Kumaragiri Textiles Ltd (KTL)	Chinnaputhur	Tirunelveli	08° 10' N	77° 26' E	Tamilnadu
Chhotabhai Jethabhai Patel & Co (CJPC)	Gangapur	Nandurbar	20° 54' N	74° 47' E	Maharashtra
Vijay S. Lodha (VSL)	Aichale	Nandurbar	20° 54' N	74° 47' E	Maharashtra

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M J Associates (MJA)	Jaisalmer	Jaisalmer	26° 55' N	70° 54' E	Rajasthan
Adarsha Gaur Gum Udyog (AGGU)	Jaisalmer	Jaisalmer	26° 55' N	70° 54' E	Rajasthan
Amar Associates (AA)	Dhandane	Nandurbar	20° 54' N	74° 47' E	Maharashtra
Hermes Electronics Pvt. Ltd. (HEPL)	Phophade	Dhule	20° 54' N	74° 47' E	Maharashtra
Raj Infrastructure Developers (RID)	Chhadvel	Dhule	20° 54' N	74° 47' E	Maharashtra
Hotel Sheetal (HS)	Aichale	Nandurbar	20° 54' N	74° 47' E	Maharashtra
P. R. Patil (PRP)	Mandal	Nandurbar	20° 54' N	74° 47' E	Maharashtra
	Gangapur	Nandurbar	20° 54' N	74° 47' E	Maharashtra
Preetam Enterprises (PE)	Wagholi	Sangli	16° 52' N	74° 34' E	Maharashtra
Shree Panchganga Agro Impex Pvt. Ltd (SPA IPL)	Shelkewadi	Sangli	16° 52' N	74° 34' E	Maharashtra
Fashion Apparels Pvt. Ltd. (FAPL)	Pohra	Jaisalmer	26° 55' N	70° 54' E	Rajasthan

The project participants as mentioned in section 3 of this report act as the primary promoter for this project activity for all purposes related to Emission Reduction.

The project has been implemented as described in the PDD. There are no major changes in the key equipment since the previous VCS verification.

The net quantity of power exported to the grid during the monitoring period (01/06/2007 to 31/05/2008 inclusive of both days) was verified to be **23,940 GWh**. This was verified by the verification team during the on-site visit by checking the recorded generation data, plant records, joint metering report and power sales billing.

All required equipment and procedures are available and implemented in an appropriate manner. The submitted monitoring report which forms the basis of the verification was prepared by summarizing consolidated monthly data over the whole monitoring period in

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accordance with the monitoring plan of the registered PDD^{/PDD/} under VCS-I.

All necessary monitoring instruments are installed. The joint measurement will be carried out once in a month in presence of both parties (the developer's representative and officials of the state power utility).

The secondary monitoring, which will provide a backup (fail-safe measure) in case the primary monitoring is not carried out, would be done at the individual WTGs. Each WTG is equipped with an integrated electronic meter. These meters are connected to the Central Monitoring Station (CMS). The generation data of individual machine can be monitored as a real-time entity at CMS.

However, following CARs and CRs were raised:

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CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
<p>CR 1</p> <p>1. PP needs to clarify regarding the name of the project participant of the project activity "17.45 MW Bundled Wind Power Project in India" because 'J. P. Morgan Ventures Energy Corporation' as written on the first page of the MR is no where mentioned in the PDD.</p> <p>2. PP needs to clarify in section 7 of the MR whether the project activity is a small-</p>	<p>Monitoring Report</p>	<p>Project participant is J. P. Morgan Ventures Energy Corporation, a company incorporated in the State of Delaware, United States, whose registered office is at 270 Park Avenue, New York, New York, 10017 - 2014 (previously we were known as Pioneer Carbon, the projects arm of Climate Care - but both companies were acquired by JP Morgan in April 2008 & now it has renamed as J P Morgan Ventures Energy Corporation).</p> <p>The project activity is large scale project activity and same is incorporated in section 7</p>	<p>Monitoring Report</p>	<p>OK, the CR has been closed.</p> <p>OK, the section 7 of the MR has been suitably</p>

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CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
<p>scale project activity or a large-scale project activity.</p> <p>3. PP need to clarify the phrase 'The applicable project activity is grid connected electricity generation from renewable energy sources. There are a number of different sizes and sub types of this project activity (run- of- river hydro power plants; hydro power projects with existing reservoirs where the volume of the reservoir is not increased, wind, geothermal, solar sources, tidal, wave)'</p>		<p>of MR.</p> <p>The necessary corrections are made & project specific information is mentioned in section 7 of MR.</p>		<p>corrected.</p> <p>OK, the section 7 of the MR has been suitably corrected.</p> <p>Hence, the CR has been closed.</p>

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CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
as mentioned in section 7 of the MR.				

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
<p>CAR 1</p> <p>1. The identification number of the following WTGs in the MR is not matching with same in the PDD:</p> <p>i. Ref. No. Mit/WP/05</p> <p>ii. Ref. No. Mit/WP/06</p> <p>iii. Ref. No. Mit/WP/11</p> <p>iv. Ref. No. Mit/WP/14</p>	/Monitoring Report/ /PDD/	The correct identification numbers of the concern WTGs as per the commissioning certificate issued by state utility are incorporated in MR.	/Monitoring Report/ /PDD/	OK, the identification numbers of the WTGs are taken as per the commissioning certificates of the WTGs. Earlier, the identification numbers of the same WTGs were written incorrectly in

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CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
<p>Correction required.</p> <p>2. The name of the project activity in the MR (first page) is not in line with the same in the PDD. Correction required.</p>	<p>/Monitoring Report/</p>	<p>The required corrections in the name of the project activity are made & is mentioned on first page of MR.</p>		<p>the registered PDD. The same has been amended in the PDD.</p> <p>OK, corrected.</p> <p>Hence, the CAR has been closed.</p>

3.2 Completeness of Monitoring

The reporting ^{/MR/} is in line with the requirements of the validated monitoring plan which is in line with the applied and approved Simplified M & P for CDM Project Activity, Category I.D. in conjunction with VCS 2007.1 monitoring method applicable for monitoring of electricity generation.

The reporting procedures reflect the requirements of the monitoring plan.

The generation data of individual machine can be monitored as a real-time entity at Central Monitoring Station (CMS).

The import and export reading of the common bulk meter is recorded every month in the presence of authorized representatives from both the power producing company and power purchasing company. These figures provide the quantum of electricity imported, exported and net export to the grid.

However, following CARs and CRs were raised:

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CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
<p>CAR 2</p> <p>1. PP needs to submit all copies of the invoices raised against the JMR for WTGs HTSC No. 2044 & HTSC No. 1955 of M/s. VSPML in line with section B.7.1 of the PDD.</p> <p>2. The invoices of the months from June, 2007 to December, 2007 for the WTG K-244 of M/s. RHR have not been submitted to the assessment team. PP needs to submit the same. Further, the readings on the submitted invoices of WTG K-244 of M/s. RHR are not matching with the JMR. PP needs to clarify.</p>		<p>1. The electricity generated by WTGs HTSC No. 2044 and HTSC No. 1955 is utilized for 100% captive use by M/s. VSPML. Hence PP has not raised invoice against sale of electricity & unable to produce the same.</p> <p>2. The required invoices for the WTG K-244 of M/s. RHR from June, 2007 to December 2007 are submitted to DOE.</p> <p>The annual total of electricity generation by the project activity as per the JMR & invoices is calculated in separate excel sheet & the lower one is considered as</p>		<p>OK</p> <p>OK</p>

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CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
<p>3. The copies of JMR of WTG K-244 of M/s. RHR are not submitted for the month from June, 2007 to August, 2007. PP needs to submit.</p> <p>4. The copies of invoices raised against JMR of the electricity generation for all the WTGs of M/s. PPEPL are not submitted to the assessment team. PP needs to submit the same as per requirement of section B.7.1 of the PDD.</p> <p>5. The copies of invoices raised against JMR of for the electricity generation for the WTG HTSC No. 1053 of M/s. SSM are not submitted to the</p>		<p>conservative for calculation of emission reductions.</p> <p>3. The copies of JMR of WTG K-244 for the month of June, 2007 to August 2007 are submitted to DOE.</p> <p>4. The copies of the invoices raised against sale of electricity to state utility for all the WTGs of M/s. PPEPL are submitted to DOE as per the requirement of section B.7.1 of PDD.</p> <p>5. The electricity generated by WTGs HTSC No. 1053 is utilized for 100% captive use by M/s. SSM. Hence PP has not raised</p>		<p>OK</p> <p>OK</p> <p>OK</p>

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CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
assessment team. PP needs to submit the same as per requirement of section B.7.1 of the PDD.		invoice against sale of electricity & unable to produce the same.		
6. The copies of invoices raised against JMR of for the electricity generation for the WTG HTSC No. 1061 of M/s. KTL are not submitted to the assessment team. PP needs to submit the same as per requirement of section B.7.1 of the PDD.		6. The electricity generated by WTGs HTSC No. 1061 is utilized for 100% captive use by M/s. KTL. Hence PP has not raised invoice against sale of electricity & unable to produce the same.		OK
7. The copies of invoices raised against JMR of for the electricity generation for the WTG No. K-315 of M/s. VSL are not submitted to the assessment team. PP needs to submit the same as per requirement of section B.7.1 of the PDD.		7. The copies of the invoices raised against JMR of the electricity generation for the WTG no. K-315 of M/s. VSL are submitted to DOE.		OK
8. The copies of invoices		8. The copies of the		OK

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CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
<p>raised against JMR of the electricity generation for the WTG No. K-339 of M/s. CJPC are not submitted to the assessment team. PP needs to submit the same as per requirement of section B.7.1 of the PDD.</p> <p>9. The copies of invoices raised against JMR of for the electricity generation for the WTG No. K-490 of M/s. AA are not submitted to the assessment team. PP needs to submit the same as per requirement of section B.7.1 of the PDD.</p> <p>10. The copies of invoices raised against JMR of for the electricity generation for the WTG No. J-30 of M/s. HEPL are not submitted to the assessment team. PP needs to submit the same as per requirement of section B.7.1 of the PDD.</p>		<p>invoices raised against JMR of the electricity generation for the WTG no. K-339 of M/s. CJPC are submitted to DOE.</p> <p>9. The copies of the invoices raised against JMR of the electricity generation for the WTG no. K-490 of M/s. AA are submitted to DOE.</p> <p>10. The copies of the invoices raised against JMR of the electricity generation for the WTG no. J-30 of M/s. HEPL are submitted to DOE.</p>		<p>OK</p> <p>OK</p>

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CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
<p>11. The copies of invoices raised against JMR for the electricity generation for the WTG No. J-131 of M/s. RID are not submitted to the assessment team. PP needs to submit the same as per requirement of section B.7.1 of the PDD.</p>		<p>11. The copies of the invoices raised against JMR of the electricity generation for the WTG no. J-131 of M/s. RID are submitted to DOE.</p>		OK
<p>12. The copies of invoices raised against JMR of for the electricity generation for the WTG No. K-384 of M/s. P. R. Patil for the month from January, 2008 to May. 2008 are not submitted to the assessment team. PP needs to submit the same as per requirement of section B.7.1 of the PDD.</p>		<p>12. The copies of the invoices raised against JMR of the electricity generation for the WTG no. K-384 of M/s. PRP for the required period are submitted to DOE.</p>		OK
<p>13. PP needs to submit the JMR copies of the following months for the WTG - W14 of</p>		<p>13. The copies of the invoices raised against JMR of the electricity</p>		OK

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CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
<p>M/s. Preetam Eneterprise</p> <p>i. July, 2007 ii. August, 2007 iii. September, 2007 iv. October, 2007 v. November, 2007 vi. April, 2008</p> <p>14. PP needs to submit the JMR copies of the following months for the WTG - W13 of M/s. SPAIPL:</p> <p>i. July, 2007 ii. October, 2007 iii. February, 2008 iv. May, 2008</p> <p>15. PP needs to submit all the copies of JMR and invoices for the electricity generation</p>		<p>generation for the WTG no. W-14 of M/s. Preetam Enterprises for the month of July 2007 to November 2007 and for the month of April 2008 are submitted to DOE.</p> <p>14. The copies of the invoices raised against JMR of the electricity generation for the WTG no. W-13 of M/s. SPAIPL for the month of July 2007, October 2007, February 2008 and May 2008 are submitted to DOE.</p> <p>15. The all copies of the JMR and invoices raised against JMR of the electricity generation for</p>		<p>OK</p> <p>OK</p>

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CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
<p>for WTG no. J-364 of M/s. FAPL.</p> <p>16. PP need to clarify regarding the calibration standard followed for the SEB energy meters in accordance with bullet no. 12 (c) annex 35 of EB 35.</p> <p>17. PP need to write the unit of grid emission factor (GEF) in table no. 2.1 of the MR.</p> <p>18. The content of the table in section 5 of the MR is not in line with the section B.7.1 of the PDD. PP needs to correct the same.</p> <p>19. The content regarding calibration of energy meters in section 6 of the MR is not in line with the section B.7.1 of</p>		<p>the WTG no. J-364 of M/s. FAPL are submitted to DOE.</p> <p>16. The IS 14697 calibration standard is followed for the SEB energy meters in India.</p> <p>17. The unit of grid emission factor (GEF) is incorporated in table no. 2.1 of the MR.</p> <p>18. The table mentioned in section 5 of the MR is corrected as per the section B.7.1 of PDD.</p> <p>19. The content regarding calibration of energy meters in section 6 of the MR is corrected &</p>		<p>OK</p> <p>OK</p> <p>OK, corrected</p> <p>OK, corrected</p>

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CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
the PDD. PP needs to correct the same.		incorporated as per the section B.7.1of the PDD.		OK, the CAR has been closed.

3.3 Accuracy of Emission Reduction Calculations

The approved CDM baseline and monitoring methodology, the Simplified M & P for CDM Project Activity, Category I.D. is applied to the project activity. The emission coefficient is calculated in accordance with the requirements of ACM0002, Version 06 and CEA data base version 2.0.

GHG emission reduction is calculated as baseline emission minus project emission and leakage. Project emissions and leakage is to be considered as zero.

As prescribed in the baseline methodology, baseline emission will be the net kWh produced/ displaced by the renewable generating unit multiplied by an emission coefficient of the grid (measured in kg CO₂e / kWh) calculated in a transparent and conservative manner. In this project, the grid emission coefficient was calculated by "combined margin method" combining the combination of "operating margin (OM)" and "build margin (BM)" as per the approved procedure. Thus baseline emission reductions for this project activity will be the amount of electricity (kWh) supplied to the grid multiplied with the emission coefficient of respective regional grids (Western and Southern Regional Grid).

The baseline emission factor EF (ex-ante) is calculated as combination of the Operating Margin emission factor (EF_{OM}) and the Build Margin emission factor (EF_{BM}):

$$EF_{GRID,Y} = 0.75 \times EF_{OM,Y} + 0.25 \times EF_{BM,Y}$$

Where, w_{OM} and w_{BM} are the weight factors ($w_{OM} + w_{BM} = 1$), and by default 0.75 for w_{OM} and 0.25 for w_{BM} for projects of solar and wind power generation.

It was verified in the course of this verification that the above mentioned methodology has been correctly and accurately applied in calculating the total emission reductions and the emission reduction calculation is accurate and conservative.

However, following CARs and CRs were raised:

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CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
<p>CAR 3</p> <p>1. PP needs to provide the back up data & demonstrate the procedure of apportioning of electricity as mentioned in section 2.3 of the MR for all the WTGs installed in the state of Maharashtra & Rajasthan.</p> <p>2. PP needs to provide the reason for no electricity generation in the month of June, 2007 & July, 2007 for WTG K-315 of M/s. VSL.</p>	<p>/Monitoring Report/ /JMR/</p>	<p>1. The backup information & demonstration of the logic of the procedure followed by SEB for apportioning of electricity is provided to DOE in separate excel sheet.</p> <p>2. The machine was not in running condition due to technical problem.</p>	<p>/Monitoring Report/ /JMR/</p>	<p>OK, the apportioning procedure has been accurately demonstrated in section 2.3 of the MR and the supporting data has been submitted.</p> <p>OK, the WTG's were facing technical problems and hence kept</p>

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CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
<p>3. PP needs to provide the reason for no electricity generation in the month of June, 2007 & July, 2007 for WTG no. J-30 of M/s. HEPL.</p> <p>4. PP needs to provide the reason for no electricity generation in the month of June, 2007 & July, 2007 for WTG no. J-085 of M/s. HS.</p>		<p>3. The machine was not in running condition due to technical problem.</p> <p>4. The machine was not in running condition due to technical problem.</p>		<p>shut down. No, emission reduction is claimed for this period.</p> <p>OK, the WTG's were facing technical problems and hence kept shut down. No, emission reduction is claimed for this period.</p> <p>OK, the WTG's were facing technical problems and</p>

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CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
<p>5. PP needs to provide the reason for no electricity generation in the month of January, 2008 for WTG no. W 14 of M/s. PE.</p> <p>6. PP needs to incorporate the corrected electricity generation and emission reductions as per the revised emission</p>		<p>5. The machine was not in running condition due to technical problem.</p> <p>The electricity generation and emission reductions as per the revised emission reduction calculation</p>		<p>hence kept shut down. No, emission reduction is claimed for this period.</p> <p>OK, the WTG's were facing technical problems and hence kept shut down. No, emission reduction is claimed for this period.</p> <p>OK</p>

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
reduction sheet. Also, incorporate the emission reductions on the 1 st page of the MR.		sheet were mentioned in the revised MR.		The CAR has been closed.

3.4 Quality of Evidence to Determine Emission Reductions

Several documents were submitted by the project proponent as evidence to determine emission reductions. Refer to Table 5-1.

The evidences were assessed as being of sufficient quantity and appropriate quality.

However, following CARs and CRs were raised:

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
CR 2 1. In accordance with Annex 35, Indicative Simplified Baseline and Methodologies for selected small-scale project activity	/Monitoring Report/, /Calibration Certificates/	1. Energy meter is supplied & owned by state electricity board in compliance with the national (IS or BIS) / IEC standard as per the notification by Central Electricity Authority, Government of India on		OK, the calibration of electrical energy meters is

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CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
<p>categories 9 (Version 11), Section A, General Guidance bullet no. 12(c) PP needs to clarify whether the energy meter calibrated/certified as per national or IEC standards and recalibrated at appropriate intervals according to manufacturer specifications.</p>		<p>March 17, 2006 (Please refer point 17 (3)). http://www.cea.nic.in/e&c/regulations/notified_regulations/Metering_Regulations.pdf</p> <p>The above notification & its compliance procedure strictly followed by all state utility as the all state utility functions under the guidance of CEA.</p> <p>All energy meters of the WEGs of this bundle are of IS 14697 standard which is mentioned on the Meter itself & for some verified during site visit.</p>		<p>done as per norms of PPA which are as CEA guidelines. It is concluded that IS 14697 standard for the calibration of the energy meters is followed. Hence, CR has been closed.</p>
<p>CAR 4</p> <p>1. PP need to incorporate the extract of the PPA as mentioned in section 2.3 of the MR.</p>		<p>1.The concern part of PPA is incorporated as separate annex in MR.</p>		<p>OK</p>

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
<p>2. PP needs to incorporate the comparison of actual electricity generation during the monitoring period with the estimated electricity generation mentioned in the PDD supported by actual facts & figures and including PLF/CUF.</p>		<p>2.The required comparison of actual & estimated electricity generation is mentioned in section 1 of MR.</p>		<p>OK, the CAR has been closed.</p>

3.5 Management and Operational System

The management and operational system of the project is suitable.

An operational structure has been established with clearly identified responsibilities and which is documented accordingly.

Responsibilities for daily meter reading, despatch of daily generation reports, O&M, calibration periodicity, and procedure are well defined.

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A FAR has been raised in the previous verification report no. 53700907-07/170 dated November 03, 2007 and the same has been addressed below:

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
<p>CAR 5</p> <p>As per the FAR 1 in the verification report no. 53700907-07/170, dated 03/11/2007 PP needs to clarify that 'Monitoring and calibration procedures (QA/QC management system) and programs have to be formalised and followed.'</p>	<p>/FVR/</p>	<p>The monitoring & calibration procedure has been formalised in the table in section B.7.1 of the VCS PD & the same is being followed as mentioned.</p>	<p>/FVR/</p>	<p>The monitoring and calibration procedure is verified during the site visit and with document review. Hence, CAR is closed.</p>

CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
<p>CAR 6</p>				

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CAR/CR	Reference	Summary of project owner response	Revised sections (as applicable)	Conclusion
<p>1. The roles and responsibilities mentioned in section 2.3 of the MR is not in line with the same in section B.7.2 of the PDD.</p> <p>2. Provide the qualifications, training schedule and competence certificates of people involved for proper monitoring.</p> <p>3. PP needs to clarify whether M/s. Suzlon is the only O & M Contractor for the whole 17.45 MW bundled wind power project activity as mentioned in section 2.3 of the MR.</p>	<p>/Monitoring Report/ /PDD/</p>	<p>1.The roles and responsibilities in line with the section B.7.2 of the PDD is incorporated in section 2.3 of the MR.</p> <p>2. The qualification, training schedule and competence certificates of people (Engineers) involved for the proper monitoring is submitted to DOE and same is verified by DOE during site visit.</p> <p>3.The M/s. VESTAS RRB, M/s. Suzlon, M/s. CWEL, M/s. ENERCON are the O & M (EPC) Contractor for the whole 17.45 MW bundled wind power project activity and the same is incorporated in section 2.3 of the MR.</p>	<p>/MR/</p>	<p>OK, corrected</p> <p>OK</p> <p>OK</p>

4 Verification conclusion

The scope of this verification covers the determination of voluntary greenhouse gas emission reductions generated by the above mentioned project. The verification is based on the submitted VCS PD, monitoring report and supporting documents made available to the verifiers by the project proponent.

As a result of the verification, the verifier confirms that:

All operations of the project are implemented and installed as planned and described in the project design document. The monitoring system is in place and functional. The installed equipment essential for generating emission reductions runs reliable and is calibrated appropriately.

The GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

Reporting period: From 01-06-2007 to 31-05-2008

Verified emission in the above reporting period:

Emission reductions:	CO₂ [tCO ₂]	CH₄ [t CH ₄]	N₂O [t N ₂ O]	HFCs [t HFC]	PFCs [t PFC]	SF₆ [t SF ₆]	Sum [tCO ₂ e]
2007	15,136	-	-	-	-	-	15,136
2008	8,804	-	-	-	-	-	8,804
TOTAL:							23,940

Project emissions 0 t CO₂ equivalents
 Baseline emissions 23,941 t CO₂ equivalents
 Emission reductions 23,941 t CO₂ equivalents

Pune, 2009-04-14

Essen, 2009-05-28




Manojkumar Borekar
 Verification Team Leader

Rainer Winter
 Final approval

TÜV NORD JI/CDM Certification Program

5 References

Table 5-1: Documents provided by the project proponent

Reference	Document
/CAL/	<ul style="list-style-type: none"> • Calibration Certificate of energy meter • Meter replacement records
/CC/	Commissioning certificates
/CON/	The signed contract between TUV NORD and J. P. Morgan Ventures Energy Corporation for carrying out verification of voluntary emission reduction.
/JMR/	Monthly electricity certificate by State Electricity Boards & Invoices against JMR and invoices
/MR/	Monitoring Report "17.45 MW Bundled Wind Power Project in India", draft version 01, January 07, 2009 and final version dated April 13, 2009
/OM/	Contract for operating the wind mill between WTG operator and PP
/PPA/	Power Purchase Agreements
/XLS/	<ol style="list-style-type: none"> 1. Excel - Calculation sheets (baseline and emission reduction calculation) provided by the project participant 2. Excel - Calculation sheets (baseline and emission reduction calculation) provided by the project participant (revised version)

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Table 5-2:

Background investigation and assessment documents

Reference	Document
/ACM0002/	Approved consolidated baseline and monitoring methodology ACM0002 (Version 06: 19 May 2006) "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"
/CBD/	CO ₂ Baseline Database (Version 2.0) for the Indian Power Sector, June 21, 2007, published by Central Electricity Authority, Ministry of Power, Government of India
/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/DVR/	Draft Verification Report for the VER project: "17.45 MW Bundled Wind Power Project in India" for the period 2007-06-01 to 2008-05-31.
/IPCC-GP/	IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, 2006
/IPCC-RM/	1. Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual 2. IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, 2006
/KP/	Kyoto Protocol (1997)
/MA/	Decision 17/CP.7 (Marrakech Accords)
/PDD/	Project Design Document for "17.45 MW Bundled Wind Power Project in India" dated 13/10/2007.
/VAL/	<ul style="list-style-type: none"> • Validation Report for VER project for "17.45 MW Bundled Wind Power Project in India" issued by TUV Nord, Report number 53700907-07/170, dated 03/11/2007. • Verification report of VER project for "17.45 MW Bundled Wind Power Project in India" issued by TUV Nord, Report number 53700907-07/170,

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Reference	Document
	dated 03/11/2007.
/VCS/	<ul style="list-style-type: none"> • The Voluntary Carbon Standard 2007.1 • The Voluntary Carbon Standard 2007 • The Voluntary Carbon Standard (V. 1)
/VVM/	IETA, PCF Validation and Verification Manual (V. 4)

Table 5-3: Websites used

Reference	Link	Organisation
/vcs/	www.v-c-s.org	VCS Website
/unfccc/	www.unfccc.int	UNFCCC Website
/cea/	www.cea.nic.in	Central Electricity Authority, India
/en/	http://www.enerconindia.net/index.jsp	Enercon India Limited
/ieta/	www.ieta.org	International Emissions Trading Association
/imp/	www.powermin.nic.in	Indian Ministry of Power
/mnes/	www.mnes.nic.in	Ministry of non-conventional energy sources
/sz/	http://www.suzlon.com/	Suzlon Energy Limited
/unfccc/	http://cdm.unfccc.int	UNFCCC-CDM

Table 5-4: List of interviewed persons

Reference	MoI ¹		Name of person	Organization
/IM02/	T	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Deepak Zade	Exec. Vice President, M/S MITCON Consultancy Services Ltd.

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Reference	MoI ¹		Name of person	Organization
/IM02/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Bhushan Pachpande	Chief Consultant, M/S MITCON Consultancy Services Ltd.
/IM02/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Tushar Chaudhari	Senior Consultant, M/S MITCON Consultancy Services Ltd.
/IM03/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Sunil Nikam	CMS Incharge, Ghatnandre CMS, Suzlon Infrastructure Services Ltd.
/IM03/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Chandrakant Patil	CMS Incharge, Wagholi CMS, Suzlon Infrastructure Services Ltd.
/IM03/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Sambhaji Bhosale	Engineer, Suzlon Infrastructure Services Ltd.
/IM03/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Vishal M. Ghadap	Engineer, Suzlon Infrastructure Services Ltd.