

53.75 MW BUNDLED WIND POWER PROJECT IN TAMIL NADU AND KARNATAKA BY KBD GROUP, INDIA



TÜV Rheinland (China) Ltd

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Summary:

Sapthagiri Distilleries Private Limited has commissioned the TÜV Rheinland (China) Ltd to carry out the verification of the Project “53.75 MW Bundled wind Power project in Tamil Nadu and Karnataka by KBD Group, India” with regard to the requirements of VCS Version 3.3 Standard.

The project activity is emission reductions achieved from 53 number of Wind Turbine Generators (WTG) aggregating to a total installed capacity of 53.75 MW implemented in Tamilnadu and Karnataka (India).

Reporting period: From 01-04-2010 to 31-03-2014 (both days included)

In the course of the verification 6 Corrective Action Request (CAR),) were raised and closed successfully. Furthermore No FAR is raised which need to be checked during next verification period.

The verification is based on the draft monitoring report/P01/, the monitoring plan as set out in the validated PD/B02/, the validation report/B02/, emission reduction calculation spreadsheet/P04/ and supporting documents made available to the TÜV Rheinland (China) Ltd by the project participant. The TÜV Rheinland (China) Ltd 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.

As the result of this periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV Rheinland (China) Ltd herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Year	BE _y	PE _y	LE _y	Emission Reductions ERY (tCO _{2e})
April 2010- Dec 2010	83,537	0	0	83,537

Jan 2011- Dec 2011	71,115	0	0	71,115
Jan 2012 - Dec 2012	69,853	0	0	69,853
Jan 2013 - Mar 2013	90,077	0	0	90,077
Jan 2014- Mar 2014	15,237	0	0	15,237

Total Emission reductions: 329, 819 t CO₂ equivalents (rounded down value)

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1 INTRODUCTION

1.1 Objective

The purpose of this verification, by independent checking of objective evidence, is as follow.

- To verify that the project is implemented as described in the VCS-PD/B02/;
- To assess the implementation of the monitoring plan (MP) content in the VCS-PD/B02/;
- To assess the project's compliance with other relevant rules, including the host country (Indonesia) legislation;
- To confirm that the monitoring system is implemented and fully functional to generate voluntary emission reductions (VERs / VCUs) without any double counting; and
- To establish that the data reported are accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emissions reduction calculation.

1.2 Scope and Criteria

The verification of this project is based on the validated project document/B02/, the monitoring report/P02/, emission reduction calculation spread sheet/P04/, supporting documents made available to the verifier and information collected through performing interviews/P09/ and during the on-site assessment. Furthermore publicly available information was considered as far as available and required.

The TÜV Rheinland (China) Ltd has employed a risk-based approach in the verification, focusing on the identification of significant risks and reliability of project monitoring and generation of emission reductions.

1.3 Level of Assurance

The verification has been planned and organized to achieve a

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

1.4 Summary Description of the Project

The project activity involves establishment of 53.75 MW Bundled wind Power project in Tamil Nadu and Karnataka by KBD Group, India. The project includes 53 number (Suzlon make: 20 number of 1500 kW, 20 number of 600 kW, 4 number of 1250 kW and Vestas make: 9 number of 750 kW capacity) of Wind Turbine Generators (WTG). The project is a green field project aimed at utilizing wind to produce power. It was estimated that the project would generate approximately 117 million units of electricity per annum,¹.

¹ As per the registered VCS PD

Table 1-1:

Project Participants:	Sapthagiri Distilleries Private Limited
Baseline and monitoring methodology:	ACM0002 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources. Version-09
Location of the project activity:	Tamilnadu and Karnataka (India) ²
Project's crediting period:	01/10/2006 to 30/09/2016 (10 years fixed crediting period)
Period verified in this verification:	01/04/2010 to 31/03/2014 (Both days included)
Project registered with CDM/Other mechanisms	Not Applicable since the project is not applied for CDM

As part of the site visit the verification team was able to confirm that the project implementation is in accordance with the project description contained in registered VCS PD.
The key parameters of the project are given in table 1.2:

Table 1.2: Technical data of the project/P18/

Technical specifications of Suzlon S-66 (1250 kW) for KBDL – 4 No.s

Rotor	
Diameter	66 m
Blades	3 No.
Orientation	Upward/ horizontal axis
Rotational speed	13.8 / 20.7 rpm
Rotational direction	Clockwise
Swept area	3421 m ²
Hub height	74 m

² Location details are as per registered PD.

regulation	Pitch regulated
Operational data	
Cut in wind speed	3 m/s
Rated wind speed	14 m/s
Cut off wind speed	22 m/s
Gearbox	
Type	Integrated 3 stage
Cooling	Oil cooled, forced lubrication
Generator	
Type	Asynchronous, 4/6 pole
Rated voltage	690 V
Frequency	50 Hz
Cooling	Air cooled

Technical specifications of Suzlon S-82 (1500 kW) for SDPL – 4 + 14 No.s and DA Srinivas – 1 No.

Rotor	
diameter	82 m
blades	3 No.
Orientation	Upward/ horizontal axis
Rotational direction	Clockwise
Swept area	5281 m ²
Hub height	80 m
regulation	Pitch regulated
Operational data	

Cut in wind speed	4 m/s
Rated wind speed	12.5 m/s
Cut off wind speed	20 m/s
Gearbox	
Type	Integrated 3 stage
Generator	
Type	Asynchronous, 4 pole
Rated voltage	690 V
Frequency	50 Hz
Cooling	Air cooled

Technical specifications of Suzlon S-52 (600 kW) for DK Audikesavulu - 19 No.s

Rotor	
diameter	52 m
blades	3 No.
Orientation	Upward/ horizontal axis
Rotational direction	Clockwise
Swept area	2124 m ²
Hub height	75 m
regulation	Pitch regulated
Operational data	
Cut in wind speed	3.5 m/s
Rated wind speed	12 m/s
Cut off wind speed	25 m/s
Gearbox	

Type	Integrated 3 stage
Cooling	Oil cooled, forced lubrication
Generator	
Type	Asynchronous, 4 pole
Rated voltage	690 V
Frequency	50 Hz
Cooling	Air cooled

Technical specifications of Vestas NM48/750 kW for DA Satyaprabha- 5 No.s and DA Srinivas – 4 No.

Rotor	
diameter	48.2 m
blades	3 No.
Orientation	Upward/ horizontal axis
Rotational direction	Clockwise
Hub height	55 m
Operational data	
Cut in wind speed	< 3.5 m/s
Cut off wind speed	25 m/s
Gearbox	
Cooling	Splash lubrication
Generator	
Nominal power	750/ 200 kW
Rotational speed (synchronous)	1500/ 1000 rpm
Insulation class	F

Technical specifications of Suzlon S-52 (600 kW) for DK Audikesavulu - 19 No.s and DA Srinivas – 1 No.

Rotor	
diameter	52 m
blades	3 No.
Orientation	Upward/ horizontal axis
Rotational direction	Clockwise
Swept area	2124 m ²
Hub height	75 m
regulation	Pitch regulated
Operational data	
Cut in wind speed	3.5 m/s
Rated wind speed	12 m/s
Cut off wind speed	25 m/s
Gearbox	
Type	Integrated 3 stage
Cooling	Oil cooled, forced lubrication
Generator	
Type	Asynchronous, 4 pole
Rated voltage	690 V
Frequency	50 Hz
Cooling	Air cooled

The project activity is a green field wind power project and the generated electricity is supplied to the southern grid . The location and ownership of the WTG swere verified during the site visit and document review is summarized below Table 1.3:

Table 1.3:

WTGs owned by KBDL

S.No.	Unique ID	HT SC No.	Capacity (kW)	Latitude	Longitude	Taluka
1	Q 195	1312	1250	N10 ⁰ 50' 07.9"	E77 ⁰ 25' 58.7"	Palladam
2	Q 211	1329	1250	N10 ⁰ 48' 59.1"	E77 ⁰ 25' 54.9"	Palladam
3	G 81	1337	1250	N10 ⁰ 44' 30.9"	E77 ⁰ 25' 40.6"	Palladam
4	G 89	1336	1250	N10 ⁰ 43' 31.0"	E77 ⁰ 25' 51.5"	Palladam

2) WTGs owned by SDPL

Sr. No.	Unique ID	HT SC No.	Capacity (kW)	Latitude	Longitude	Taluka
5	G 936	1442	1500	N10 ⁰ 33' 46.0"	E77 ⁰ 19' 19.0"	Palladam
6	G 938	1440	1500	N10 ⁰ 33' 45.4"	E77 ⁰ 19' 47.1"	Palladam
7	G 953	U 1441	1500	N10 ⁰ 33' 32.4"	E77 ⁰ 18' 34.8"	Palladam
8	R73	2155	1500	N8 ⁰ 17.383'	E77 ⁰ 44.084'	Sankaneri
9	R166	2317	1500	N8 ⁰ 14.466'	E77 ⁰ 44.764'	Sankaneri
10	R104	2309	1500	N8 ⁰ 17.343'	E77 ⁰ 44.865'	Sankaneri
11	R116	2310	1500	N8 ⁰ 16.728'	E77 ⁰ 45.629'	Sankaneri
12	R124	2311	1500	N8 ⁰ 16.024'	E77 ⁰ 45.860'	Sankaneri
13	R134	2312	1500	N8 ⁰ 16.036'	E77 ⁰ 45.513'	Sankaneri
14	R138	2313	1500	N8 ⁰ 15.610'	E77 ⁰ 45.302'	Sankaneri
15	R173	2314	1500	N8 ⁰ 14.014'	E77 ⁰ 45.702'	Sankaneri

16	R180	2315	1500	N8° 13.753'	E77° 45.703'	Sankaneri
16	R178	2316	1500	N8° 13.681'	E77° 45.199'	Sankaneri
18	R187	2318	1500	N8° 13.397'	E77° 43.764'	Sankaneri
19	R181	2325	1500	N8° 13.627'	E77° 43.759'	Sankaneri

WTGs in Karnataka

No.	Location No.	RR No.	Capacity (kW)	Latitude	Longitude	Taluka
20	H23	HSN/TL&SS/WF/H2 3/04	1500	N 13 10 81.6	E 76 11 50.6	Arasikere
21	H24	HSN/TL&SS/WF/H2 3/04	1500	N 13 10 95.8	E 76 11 44.3	Arasikere
22	K310	GDG/TL&SS/WF/SD PLK/K-311/89	1500	N15 08 38.6	E 75 46 49.8	Mundargi
23	K311	GDG/TL&SS/WF/SD PLK/K-311/89	1500	N15 08 18.3	E 75 47 15.5	Mundargi

3) WTGs owned by DK Audikesavulu

S.No.	Unique ID	HT SC No.	Capacity (kW)	Latitude	Longitude	Taluka
24	G 335	D 8	600	N10° 35' 40.2"	E77° 24' 26.2"	Palladam
25	G 344	D 5	600	N10° 35' 30.9"	E77° 25' 01.9"	Palladam
26	G 369	D 11	600	N10° 35' 05.4"	E77° 25' 13.8"	Palladam
27	G 340	D 4	600	N10° 35' 21.5"	E77° 24' 41.6"	Palladam
28	G 342	D 13	600	N10° 35' 34.9"	E77° 24' 39.2"	Palladam
29	G 374	D 7z	600	N10° 35' 01.3"	E77° 24' 20.5"	Palladam
30	G 367	D 14	600	N10° 35' 01.7"	E77° 24' 44.2"	Palladam

31	G 366	D 6	600	N10° 35' 05.9"	E77° 24' 33.1"	Palladam
32	G 541	D 16	600	N10° 34' 42.6"	E77° 26' 54.1"	Palladam
33	G 543	D 21	600	N10° 34' 33.9"	E77° 26' 55.6"	Palladam
34	G 545	D 19	600	N10° 34' 26.9"	E77° 27' 07.8"	Palladam
35	G 546	D 17	600	N10° 34' 24.3"	E77° 26' 54.4"	Palladam
36	G 438	D 20	600	N10° 33' 38.3"	E77° 26' 13.1"	Palladam
37	G 476	D 25	600	N10° 32' 51.3"	E77° 26' 08.0"	Palladam
38	G 460	D 22	600	N10° 33' 11.9"	E77° 26' 22.6"	Palladam
39	G 420	D 23	600	N10° 32' 43.7"	E77° 26' 31.5"	Palladam
40	G 471	D 24	600	N10° 32' 54.5"	E77° 25' 00.3"	Palladam
41	G 536	D 12	600	N10° 32' 57.1"	E77° 24' 40.6"	Palladam
42	G 407	D 10	600	N10° 33' 04.3"	E77° 24' 33.3"	Palladam

4) WTGs owned by DA Satyaprabha

S.N.	Unique ID	On Board at site	HT SC No.	Capacity (kW)	Latitude	Longitude	Taluka
43	55255	G 897/10	2319/TIN	750	N9° 01' 29.2"	E77° 24' 00.6"	Surandai
44	55257	G 897/18	2320/TIN	750	N9° 00' 58.1"	E77° 24' 44.4"	Surandai
45	55258	G 897/19	2321/TIN	750	N9° 01' 06.3"	E77° 22' 45.5"	Surandai
46	55253	G 897/8	2233/TIN	750	N9° 01' 23.9"	E77° 31' 34.8"	Surandai
47	55254	G 897/9	2232/TIN	750	N9° 01' 05.6"	E77° 30' 29.7"	Surandai

5) WTGs owned by DA Srinivas

S.No.	Unique ID	HT SC No.	Capacity (kW)	Latitude	Longitude	Taluka
48	55244	2270/TIN	750	N8 ⁰ 56' 27.6"	E77 ⁰ 38' 06.4"	Surandai
49	55250	2306/TIN	750	N9 ⁰ 01' 25.9"	E77 ⁰ 32' 01.5"	Surandai
50	55245	2289 TIN	750	N8 ⁰ 56' 26.8"	E77 ⁰ 38' 41.9"	Surandai
51	55252	2307	750	N9 ⁰ 01' 13.7"	E77 ⁰ 30' 28.8"	Surandai
52	G 399	D 9	600	N10 ⁰ 33' 24.3"	E77 ⁰ 24' 02.9"	Palladam
53	R107	2170	1500	N8 ⁰ 17.297'	E77 ⁰ 45.182'	Sankaneri

During the monitoring period 01-April-2010 to 31-March-2014 (both days included) the total emission reduction comes to **344,983 tCO_{2e}**.

The on-site visit was carried out on 09/01/2015, 10/01/2015 and 12/01/2015. All the members of the Verification team attended the site visit and investigated the operation and monitoring of the geothermal power plant of PT. Indonesia Power.

2 VERIFICATION PROCESS

2.1 Method and Criteria

The verification of the project consists of the following steps:

- Contract review sheet (CRS)
- Appointment of team members and technical reviewers
- Receiving the monitoring report from PP
- Desk review of the Validated PD, Monitoring Report and Emission reduction calculation spread sheet submitted by the client and additional supporting documents
- Verification planning,
- On-Site assessment,
- Background investigation and follow-up interviews with personnel of the project developer and its contractors,
- Draft verification reporting
- Resolution of corrective actions (if any)
- Final verification reporting
- Technical review
- Final approval of the verification.

2.2 Document Review

The submitted MR (version 1)/P01/ and supporting background documents related to the project design and Monitoring plan was reviewed.

Furthermore, the verification team used additional documentation by third parties like host party legislation, technical reports, annual report referring to the project design or to the basic conditions and technical data. The references used in the course of this verification are summarized in section 6.

2.3 Interviews

The verification team has carried out interviews in order to assess the information included in the project documentation and to gain additional information regarding the compliance of the project with the relevant criteria applicable for the VCS 3.3.

During verification the verification team has performed interviews to confirm selected information and to resolve issues identified in the document review. The main topics of the interviews are summarized in below table.

Ref	Date	Name	Organization	Topic
/I-01/	09/01/2015, 10/01/2015 and 12/01/2015	Mr. P.S. Chakrapani	Sapthagiri Distilleries Private Limited	Discussion on implementation of the project activity, organization structure, internal audit and monitoring roles and responsibilities. Discussion on the monitoring procedure for each parameter and the measurement technique including Information flow (from data generation, aggregation, to recording, calculation and reporting). Discussion on calibration meters
/I02/	09/01/2015, 10/01/2015 and 12/01/2015	Ms. Rajivie	General Carbon Advisory Services Pvt. Ltd.	Discussion on the monitoring report in particular compliance of implemented monitoring plan with the applied monitoring methodology and the registered monitoring plan including data cross check for each parameter and discussion on final reporting of the monitoring parameters. Discussion on the monitoring procedure for each parameter and the measurement technique including Information flow. QA/QC procedures, training.

2.4 Site Inspections

As most essential part of the verification exercise it is indispensable to carry out an inspection on site in order to verify that the project is implemented in accordance with the applicable criteria. The verification team has carried out an inspection on site in order to verify that the project is implemented in accordance with the applicable criteria. Furthermore, the on-site assessment was conducted and monitoring data were checked with respect to accuracy to ensure the calculation of emission reductions. The main tasks covered during the site visit include, but are not limited to:

- The on-site assessment included an investigation of whether all relevant equipment is installed and works as anticipated.
- The operating staff was interviewed and observed in order to check the risks of inappropriate operation and data collection procedures.

- Information processes for generating, aggregating and reporting the selected monitored parameters were reviewed.
- The duly calibration of all metering equipment was checked.
- The monitoring processes, routines and documentations were audited to check their proper application.
- The monitoring data were checked completely.
- The data aggregation trails were checked via spot sample down to the level of the meter recordings.

The on-site visit was carried out on 09/01/2015, 10/01/2015 and 12/01/2015. Two of the Verification team attended the site visit and investigated the operation and monitoring of the WTG plants.

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

Table 3.3: Involved Personnel

Verification Team			Type of Involvement						
Full name	Affiliation TÜV Rheinland	Appointed for Sectoral Scopes (Technical Areas)	Supervising the work	Desk review	Site Visit + Interview	Report and protocol Writing	Expert Technical Input	Reporting Support	Technical Reviewer
Mr. M.P.Kanal	India	1.2, 3.1, 6.1, 13.1, 13.2, 15.1	X	X	X	X	X	X	
Mr. Chetan Swaroop Sharma	India	1.2		X		X		X	
Ms. Indumathi C	India	1.2							X

The following performance records was checked during verification process, joint meter readings/P08/, Monthly electricity sale invoices/P09/, daily and monthly generation reports/P10/, calibration records/P05/ of all the monitoring instruments, training records/P16/ and basis for emission reduction calculation/P04/. All the values mentioned in the emission reduction spread sheet were based on the reviewed documents. These data values and other information related to project performance including calibration and meter testing details are available in the form of hard copy and records duly archived and maintained as per the quality assurance/quality control procedure specified as a part of monitoring plan given in the validated VCS-PD.

2.5 Resolution of Findings

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

A **Corrective Action Request (CAR)** is established where:

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

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

2.5.1 Forward Action Requests

A **Forward Action Request (FAR)** will be issued when certain issues related to project implementation should be reviewed during the first verification.

A detailed list of the CARs CLs and FAR raised and discussed in the course of this verification is included in the next section 4 of this report

2.6 Eligibility for Validation Activities

Validation was performed by another DOE “TÜV NORD CERT GmbH” and submitted to VCSA. The project is already registered under VCS .

3 VALIDATION FINDINGS

Gap Validation

There was no gap validation of the project conducted during this monitoring period. Verification of this project is based on already validated project document /B02/, Validation report /B02/ the Validation statement /B02/.

3.1 Participation under Other GHG Programs

The project has been registered only with VCS. Hence Gap validation NA.

The conclusions of this verification report shows that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation against the VCS version 2007.1 standards without any qualifications or limitations. Please refer Validation report /B03/.

3.2 Methodology Deviations

No methodology deviation foreseen during the current monitoring period.

3.3 Project Description Deviations

No deviation in the project description during the current monitoring period.

3.4 Grouped Project

No new project activity instances are identified or proposed by the project proponent during the current monitoring period.

4 VERIFICATION FINDINGS

In this section the assessments and findings from the desk review of the VCS-PD, site visit, interviews and supporting documents as well as the final assessments are summarized.

4.1 Project Implementation Status

The project activity has implemented 53 number (Suzlon make: 20 number of 1500 kW, 20 number of 600 kW, 4 number of 1250 kW and Vestas make: 9 number of 750 kW capacity) of Wind Turbine Generators (WTG) aggregating to a total installed capacity of 53.75 MW. The Project has been completed as planned and the monitoring equipments were installed to monitor the parameters as described in the Project Document (PD). The Plants are in operation continuously since its commercial operations.

The project activity has supplied 48,653 MWh electricity to the southern grid during the monitoring period.

The project was registered under “Voluntary Carbon Standards Version2007.1”. All the raised CARs, CLs have been closed successful during validation stage. No FAR has been raised.

The project’s baseline emissions are determined as the product of the net electricity supplied to the Southern grid by the project and the validated ex-ante emission factor/P18/ (as per the registered vcs-PD/B02/, during the first crediting period). Project emissions due to the project activity are considered as per the requirements of ACM 0002 methodology/B01/. Leakage is considered to be zero as per the applied methodology/B01/. The same was also confirmed during on-site visit/P09/.

Herewith, the Verification Team summarizes major changes between initial VCS Monitoring Report and final version of Monitoring Report for submission as follows:

Subject	Initial Monitoring Report (MR)	Correction to initial MR in the final MR submission for issuance with DOE assessment and reason of acceptance.
Consistency		
MR (project title / participants involved/ project location / reference numbers	Project Title: 53.75 MW Bundled wind Power project in Tamil Nadu and Karnataka by KBD Group, India Participants involved: Sapthagiri	Project Title: No change

/ report date and version etc)	Distilleries Private Limited Project location: Tamil Nadu, Karnataka	Participants involved: No change Project location: No Change
Methodologies (title and version numbers) MR and its version	Methodology Title & version number: ACM0002 "Consolidated methodology for grid-connected electricity generation from renewable sources, version 09	No change
CER calculations (formula applied/ amount of emission reduction)	$ER_y = BE_y - PE_y - L_y$ $BE_y = 344,983 \text{ tCO}_{2e}$ $PE_y = 0$ $EG_y = BE_y - PE_y - LE_y$ $ER_y = 329,819 \text{ tCO}_{2e}$	No change
Please refer to Table 7 (CAR/CL) of this report for details of each change between initial MR and the final MR for submission. The Verification Team has carried out the verification process based on the initial MR and raised CARs/CLs against the project by issuing the verification protocol. With the updated information and corrections done on final MR, the PP has addressed all the CARs /CLs that were raised by the Verification Team. It is concluded that the Verification Team has reviewed the project in line with the VVS/VCS version 3.3 and all the evidence, corrections, justifications and updating done on the final MR with respect to CARs /CLs raised are accepted and closed by the Verification Team, issuing the positive verification opinion for project registration. No FAR is raised.		

Final Assessment:

During the verification an on-site visit was carried out. By means of the on-site visit and interview with the PP/IM01&/IM02/ it is checked that the realized technology, the project equipment's, the project design has been implemented and operated as described in the validated VCS-PD. Except some routine maintenancethere are no major blackouts during the fourth verification. All the records are verified and it is concluded by the DOE that all the above identified outages didn't affect the applicability of the methodology or its monitoring plan. There is no other change envisaged in the project activity. These facts have been verified during site visit by interviewing the monitoring personnel's and review of documents.

No FAR is raised during the current monitoring period. No remaining issues/ discrepancies in previous verification of the project are left out.

The amount of emission reductions over the monitoring period is **329,819** tCO_{2e}. Hence as seen above, there is no change in the implementation of the project activity with the description contained in the VCS PD. In accordance with VCS requirements the verification team reviewed the registered VCS PD, including the monitoring plan and the corresponding validation report, the applied monitoring methodology, relevant decisions from the VCS board and found that the MR for this monitoring period is in line with all the requirements of VCS version 3.3.

No FAR was raised during the validation and first verification.

☒ Nevertheless, CAR -01 CAR 02, were raised and successfully closed (refer Table 7 for more details).

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

The proposed project uses CDM approved methodology ACM0002 -“Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, Version 09, which is approved under VCS version 3.3. The application of monitoring methodology is assessed as correct. The reporting and criteria are in line with the requirements of the validated monitoring plan as well as with the applied methodology ACM0002 version 07.

The reporting procedures reflect the requirements of the monitoring plan. The monitoring parameters are recorded as per the monitoring plan. The monitoring plan and Standard Operation Procedure provides detailed information related to the collection and archiving of all relevant data needed to:

Karnataka:

- Net electricity supplied to Southern grid by the project activity in this monitoring period
- Total electricity generated by the project activity (i.e. Export)/ in this monitoring period
- Transmission loss (or line loss) incurred by the project activity during import of electricity
- Transmission loss (or line loss) incurred by the project activity during export of electricity.

Tamil Nadu

- Net electricity supplied to the regional electricity grid/ in this monitoring period

As most essential part of the verification exercise it is indispensable to carry out an inspection on site in order to verify that the project is implemented in accordance with the applicable criteria. Furthermore the on-site assessment is necessary to check the monitoring data with respect to accuracy to ensure the calculation of emission reductions. The main tasks covered during the site visit include, but are not limited to:

- The on-site assessment included an investigation of whether all relevant equipment is installed and works as anticipated.
- The operating staff was interviewed and observed in order to check the risks of inappropriate operation and data collection procedures.
- Information processes for generating, aggregating and reporting the selected monitored parameters were reviewed.

- The duly calibration of all metering equipment was checked.
- The monitoring processes, routines and documentations were audited to check their proper application.
- The monitoring data were checked completely.

The data aggregation trails were checked via spot sample down to the level of the meter recordings.

Before and during the on-site visit the verification team performed interviews with the project participants to confirm selected information and to resolve issues identified in the document review.

Final Assessment

All relevant evidences such as joint meter readings/P08/, Monthly electricity sale invoices/P09/, daily and monthly generation reports/P10/, /, calibration records/P05/ and emission reduction spread sheet/P04/, regarding the monitoring were fully checked by the verification team. All evidences are clearly identifiable and assessed to be correct. . Hence this can be considered to be valid and the source of data presented for the period from 01/04/2010 to 31/03/2014 is valid and correct. There is no delay in calibration. Hence all the value applied for emission reduction calculation is found to be accurate and conservative.

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

It is evident from the monitoring data that the monitoring system ensures for continuous operation, with planned and forced shut down during the third monitoring period.

All internal data are subjected to QA/QC measures. All monitored data are archived in Physical and Electronic form. These were verified during the site visit and found that proper procedures were adopted for data handling.

The PP has submitted the monthly generation records/P07/ for the monitoring period. The electricity generation details provided in the emission reduction calculation sheet are cross verified and found to be line with the monthly electricity sales receipt/P09/ generated from the project owner revenue meter which is cross verified against the monthly generation statement/P07/.

The meters are to be calibrated once in a year as per the requirements of PPA/P11/ which is in line with the UNFCCC (EB 55, Annex 35, Para 17 C) and validated VCS-PD/B02/. The calibration records for the meters were checked by the verification team and found to be correct. Errors have been applied for delay in calibration which were checked to be OK. All internal data are subjected to QA/QC measures. All monitored data are archived in Physical and Electronic form. These were verified during the site visit and found that proper procedures were adopted for data handling.

Monitoring Parameter:

During the verification, all relevant monitoring parameters (as listed in Section 3.2 and 3.3 of the VCS PD/B02/) have been verified with regard to the appropriateness of the applied measurement / determination method, the correctness of the values applied for ER calculation, the accuracy, and applied QA/QC measures. The results as well as the verification procedure are described parameter-wise in the project specific verification checklist.

After appropriate corrections were carried out by the project participant it can be confirmed that all monitoring parameters have been measured / determined without material misstatements and are in line with all applicable standards and relevant requirements.

The audit team verified following documents and respective parameters:

- Joint meter readings/P08/,
- Monthly electricity sale invoices/P09/,
- Daily and monthly generation reports/P10/,
- Calibration records/P05/ and
- Emission reduction spread sheet/P04/

All the figures as per the monitoring plan were cross-checked by the verification team against basic monitored data and the calculations were found to be correct.

The key monitoring parameter with influence on the calculation of the emission reductions is the net power exported to the Southern grid. The power is measured with an accuracy and duly calibrated class 0.5s and 0.2 s accuracy class energy meters/P05/.

All records needed for monitoring are archived in line with the requirements of the registered monitoring plan. No significant, lack of evidence and missing data were detected during on-site verification/P09/.

The below tables provide a short summary on the verification of every parameter listed in the monitoring plan.

Tamil Nadu

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of VCS-PD):	EGy - Net electricity supplied to Southern grid by the project activity in this monitoring period
Measuring frequency:	Continuously measured
Reporting frequency:	Continuously measured and monthly reported
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	(tri-vector) meter
Is accuracy of the monitoring equipment as stated in the VCS-PD? If the VCS-PD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practice?	Metering system for the project activity consists of one main (tri-vector) meter of accuracy class 0.5. Net electricity supplied to grid will be measured through meter readings of this two-way export/ import meter installed by TNEB which is in line with the requirements of monitoring plan.
Calibration frequency /interval:	Once in a year
Is the calibration interval in line with the monitoring plan of the VCS-PD? If the VCS-PD does not specify the frequency of	yes

calibration, does the selected frequency represent good monitoring practice?	
Company performing the calibration:	TNEB
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes
Is(are) calibration(s) valid for the whole reporting period?	No. The meters are not calibrated in the reported frequency. Hence, the maximum possible error is applied as conservative option.
If applicable, has the reported data been cross-checked with other available data?	The DOE has cross verified the daily generation readings and check meter readings
How were the values in the monitoring report verified?	Net electricity supplied to grid will be measured through meter readings of the two-way export/import meter installed by TNEB. JMR is issued on monthly basis. The value 301,930 MWh have been provided in the ER sheet/P04/ which is verified and found to be correct. The value provided based on the value adjusted to maximum possible error (ie, 0.5%) for the complete monitoring period as conservative option since the calibration was not done as per frequency mentioned in the VCS-PD.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, all the applicable QA/QC procedures are carried out as described in monitoring plan of the registered VCS-PD.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA.

Karnataka

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of VCS-PD):	TEG _y - Total electricity generated by the project activity (i.e. Export)/ in this monitoring period
Measuring frequency:	Continuously measured
Reporting frequency:	Continuously measured and monthly reported

Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	(tri-vector) meter
Is accuracy of the monitoring equipment as stated in the VCS-PD? If the VCS-PD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practice?	Metering system for the project activity consists of main meter and check meter of accuracy class 0.2. Electricity export to grid will be measured through joint meter readings of this meters installed by CESC Mysore/ HESCOM which is in line with the requirements of monitoring plan.
Calibration frequency /interval:	Once in a year
Is the calibration interval in line with the monitoring plan of the VCS-PD? If the VCS-PD does not specify the frequency of calibration, does the selected frequency represent good monitoring practice?	yes
Company performing the calibration:	CESC Mysore/ HESCOM
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes
Is(are) calibration(s) valid for the whole reporting period?	No. The meters are not calibrated in the reported frequency. Hence, the maximum possible error is applied as conservative option.
If applicable, has the reported data been cross-checked with other available data?	The DOE has cross verified the daily generation readings and check meter readings
How were the values in the monitoring report verified?	In case of electricity exported, initial reading gives the meter reading of 'Export' at the first day of the previous month whereas; final reading gives the meter reading of 'Export' at the first day of the present month. The difference between initial and final reading gives the 'Export' for the last month. Total electricity generated (or exported) by the project activity is arrived at by adding the 'Export' readings of all metering points of the project activity. The value 53,215 MWh has been provided in the ER sheet/P04/ which is verified and found to be correct. The value provided based on the value adjusted to maximum possible error (ie, 0.2%) for the complete monitoring period as conservative option since the calibration was not done as per frequency mentioned in the VCS-PD.

Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, all the applicable QA/QC procedures are carried out as described in monitoring plan of the registered VCS-PD.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA.

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of VCS-PD):	EGT-I - Transmission loss (or line loss) incurred by the project activity during import of electricity
Measuring frequency:	Continuously measured
Reporting frequency:	Continuously measured and monthly reported
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	(tri-vector) meter
Is accuracy of the monitoring equipment as stated in the VCS-PD? If the VCS-PD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practice?	Details of transmission loss can be obtained from the invoice copy which gives details of export, import, transmission loss & net generation. The invoice copies were checked.
Calibration frequency /interval:	-
Is the calibration interval in line with the monitoring plan of the VCS-PD? If the VCS-PD does not specify the frequency of calibration, does the selected frequency represent good monitoring practice?	-
Company performing the calibration:	-
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	-
Is(are) calibration(s) valid for the whole reporting period?	-

If applicable, has the reported data been cross-checked with other available data?	The DOE has cross verified main meter readings with check meter readings
How were the values in the monitoring report verified?	EGT-I is calculated by using the following formula: $\text{EGT-I} = 0.15 \times \text{EGI}$ HESCOM/CESC Mysore charges project proponent for the transmission losses incurred during import of electricity to an extent of 115%. The value 41.89 MWh has been provided in the ER sheet/P04/ which is verified and found to be correct. The value provided based on the value adjusted to maximum possible error (ie, 0.2%) for the complete monitoring period as conservative option since the calibration was not done as per frequency mentioned in the VCS-PD.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, all the applicable QA/QC procedures are carried out as described in monitoring plan of the registered VCS-PD.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA.

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of VCS-PD):	EG _{T-E} - Transmission loss (or line loss) incurred by the project activity during export of electricity.
Measuring frequency:	Continuously measured
Reporting frequency:	Continuously measured and monthly reported
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	(tri-vector) meter
Is accuracy of the monitoring equipment as stated in the VCS-PD? If the VCS-PD does	Bulk meters are installed for the purpose of determining transmission loss (or line loss). It also

not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practice?	gives the total electricity exported and imported by all the wind turbines connected to the sub-station.
Calibration frequency /interval:	-
Is the calibration interval in line with the monitoring plan of the VCS-PD? If the VCS-PD does not specify the frequency of calibration, does the selected frequency represent good monitoring practice?	-
Company performing the calibration:	-
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	-
Is(are) calibration(s) valid for the whole reporting period?	-
If applicable, has the reported data been cross-checked with other available data?	The main meter readings are cross checked using check meters
How were the values in the monitoring report verified?	The formula for calculating the transmission loss was checked to be correct. By multiplying the percentage of transmission loss with electricity exported by the project activity, the transmission loss incurred by the project activity can be arrived at. Invoice copy contains this figure. Invoices are raised based on the joint meter readings taken at each metering point as well as joint meter readings taken at the respective sub-stations. Details of transmission loss can be obtained from the invoice copy which gives details of export, import, transmission loss & net generation.. The value 1276.31MWh has been provided in the ER sheet/P04/ which is verified and found to be correct. The value provided based on the value adjusted to maximum possible error (ie, 0.2%) for the complete monitoring period as conservative option since the calibration was not done as per frequency mentioned in the VCS-PD.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, all the applicable QA/QC procedures are carried out as described in monitoring plan of the registered VCS-PD.

In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA.
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Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of VCS-PD):	EG _y - Total electricity generated by the project activity (i.e. Export)/ in this monitoring period
Measuring frequency:	Continuously measured
Reporting frequency:	Continuously measured and monthly reported
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	(tri-vector) meter
Is accuracy of the monitoring equipment as stated in the VCS-PD? If the VCS-PD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practice?	Metering system for the project activity consists of main meter and check meter of accuracy class 0.2. Electricity export to grid will be measured through joint meter readings of this meters installed by CESC Mysore/ HESCOM which is in line with the requirements of monitoring plan.
Calibration frequency /interval:	Once in a year
Is the calibration interval in line with the monitoring plan of the VCS-PD? If the VCS-PD does not specify the frequency of calibration, does the selected frequency represent good monitoring practice?	yes
Company performing the calibration:	CESC Mysore/ HESCOM
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes
Is(are) calibration(s) valid for the whole reporting period?	No. The meters are not calibrated in the reported frequency. Hence, the maximum possible error is applied as conservative option.
If applicable, has the reported data been cross-checked with other available data?	The DOE has cross verified Invoice of electricity sale to CESC Mysore/HESCOM with the daily generation readings and check meter readings
How were the values in the monitoring	Invoices are raised based on the joint meter readings taken at each metering point as well as

report verified?	joint meter readings taken at the sub-station. Invoice copy thus provides details of export, import, transmission losses & net generation. Payments are made on the basis of the net electricity supplied to the grid. Net electricity supplied to the regional electricity grid will be calculated using the formula: $EG_y = TEG_y - EG_I - EG_{T-E} - EG_{T-I}.$ Net electricity generated value 52,529 MWh has been provided in the ER sheet/P04/ which is verified and found to be correct.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, all the applicable QA/QC procedures are carried out as described in monitoring plan of the registered VCS-PD.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA.

Accuracy of equipment

The DOE has verified the calibration records of the measuring instrument namely energy meter. The accuracy of measurement of the monitoring equipment was verified during the site visit. This is according to the requirements monitoring plan. All these meters have been calibrated as per the VCS-PD during the fourth verification period. The monitoring equipment's have been installed in the project activity according to registered monitoring plan.

However, the energy meters are not calibrated in the reported frequency ie, once in year. Hence, the maximum possible error is applied as conservative option. This seems to be appropriate and in line with para 395 of CDM validation and verification Standard, version 09

All internal data are subjected to QA/QC measures. All monitored data are archived in Physical and Electronic form. Details on monitoring constraint was verified during the site visit and found that proper procedures were adopted for data handling. The data will be stored for 2 years after the end of crediting period or till the last issuance of VERs for this project activity whichever occurs later.

Assessment of data and calculation of greenhouse gas emission reductions:

The emission reductions are calculated as baseline emissions deducted by project emissions and leakage. The net electrical energy exported to the grid is calculated as the difference between total energy exported minus import. Grid emission factor for the Southern grid multiplied by the net electrical exported to the grid results in the baseline emissions/B02/.

As the project is generation of power from wind. Project emissions and leakage are considered to be zero as per applied methodology. The original monitoring data to calculate the emission reductions is taken from the monthly sales receipt for the generation and monthly generation report. This data is the basis for the calculation of the emission reductions as given in the spreadsheet

Appropriate calculation methods (i.e. in accordance with ACM 0002, version 09) are applied. The grid emission factor of 0.9269 tCO₂/MWh for the Southern Grid India has been rightly applied in this monitoring period.

Baseline Emissions:

The formula used for the determination of baseline emissions which is consistent with the one in the VCS-PD is:

$$BE_y = EG_y \cdot EF_y$$

Where EG_y = Net electricity supplied to grid in a given year (MWh)

EF_y = Emission factor for a given year (tCO₂/MWh)

The baseline emissions (BE_y) during this monitoring period are **329,819 tCO₂**.

Project Emission:

As per the registered PD, the project activity does not emit any GHGs and hence project emission is zero. Based on the above the **PE_y (Project Emission)** for the monitoring period is: **0 tCO₂e**

Leakage Emission:

No leakage is considered as per the methodology.

Delay in Calibration:

The calibration of electricity meters was not done annually.

The maximum permissible error is 0.5% for Tamil Nadu WTGS and 0.2% for Karnataka WTGS for the energy meters used in the project activity. Since the calibration was conducted after due date, as a conservative measure, the data were adjusted by applying maximum meter calibration error has been applied for the complete monitoring period as conservative option. As per UNFCCC guidelines EB 52-Annex 60, Permissible errors have been applied for the periods which were verified to be correct.

Emission Reduction:

Summary of Emission Reductions/P04/ using the formula $ER_y = BE_y - PE_y - LE_y$ during this monitoring period:

Capacity (MW)	Verification period	Net Electricity Exported(in MWh)	Grid Emission Factor (tCO ₂ /MWh)	Baseline Emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Emission Reductions (tCO ₂ e)
53.75 MW	01-04-2010 to 31-03-2014 (Both days included)	354,459	0.9269	329,819	0	329,819

Thus it is confirmed that the ER calculation is transparent, conservative and correct. The supporting documents including the joint meter readings, daily generation reports, sales invoice receipts, calibration records, log records etc were verified and found to be acceptable with regard to the requirements of the methodology and the VCS PD.

All the energy meters are to be calibrated once in a year as per validated VCS PD /B02/. There was some delay in calibration of energy meters/P05/ and proper error factor has been applied as per the Guideline. /.

All the monitored data are archived in electronic form. The data will be kept for the whole crediting period and additional 2 years as given in the PD.

Final Assessment

Proper data management including data acquisition, aggregation and data management system is being followed at the project site.

All records needed for monitoring are archived in line with the requirements of the validated monitoring plan /VCS-PD/. Operation manual submitted by the PP includes all the emergency preparedness for unrecorded data and major break down. It is evident from the monitoring data that the monitoring system ensures for continuous operation, with some break down has been found during the monitoring period.

All internal data are subjected to QA/QC measures. All monitored data are archived in Physical and Electronic form. These were verified during the site visit and found that proper procedures were adopted for data handling.

The monitoring personnel at site are well trained and follow reproducible routines as was evident during the site visit. Members of monitoring team were interviewed. Procedure for training and maintenance of critical equipment's were discussed during site visit. Day to day operation is supervised by the technically qualified site engineers who have adequate knowledge. They have the responsibility to supervise various technical staff for around the clock who engage in operation and maintenance of project activity. Training records for the monitoring personnel were reviewed during site visit/P16/. All necessary monitored and measured raw data were checked during on-site verification (Ref Section 6 of this report).

Management and Operational System

The allocation of responsibilities is documented in a written form. This has been verified. Routines for the archiving of data are defined and documented. Calculations are laid down in the monitoring report and are in line with VCS PD..

Roles and responsibilities are allocated and all these were verified and found to be OK

Final Assessment

All internal data are subjected to QA/QC measures. All monitored data are archived in Physical and Electronic form. Details on monitoring constraint was verified during the site visit and found that proper procedures were adopted for data handling. The data will be stored for 2 years after the end of crediting period or till the last issuance of VERs for this project activity whichever occurs later.

All meters undergo calibration regularly and the reports were verified and found to be in accordance with the wheeling agreement and monitoring plan mentioned in the VCS PD. The MR mentions in detail the calibration procedures adopted and meter details including calibration dates and their delays. A conservative approach has been taken to calculate the ER. The monitoring report therefore satisfies the calibration procedure and the calibration frequency.

☒ No CAR was raised

4.4 Non-Permanence Risk Analysis

NA.

5 VERIFICATION CONCLUSION

Sapthagiri Distilleries Private Limited has commissioned the TÜV Rheinland (China) Ltd to carry out the verification of the Project “53.75 MW Bundled wind Power project in Tamil Nadu and Karnataka by KBD Group, India” with regard to the requirements of VCS Version 3.3 Standard.

Reporting Period: From 2010-04-01 to 2014-03-31 (both days included)

In the course of the verification 6 Corrective Action Requests (CAR) were raised and closed successfully. No FAR is raised.

The verification is based on the draft monitoring report/P01/, revised monitoring report/P02/, the monitoring plan as set out in the validated PD/B02/, the validation report/B02/, emission reduction calculation spreadsheet/P04/ and supporting documents made available to the TÜV Rheinland (China) Ltd by the project participant.

In detail the conclusions can be summarized as follows:

- All operations of the project are implemented and installed as planned and described in the validated project description.
- The monitoring plan is in accordance with the applied approved methodology, i.e., ACM 0002, version 09.
- The installed equipment essential for measuring parameters required for calculating emission reductions is calibrated appropriately with some delays.
- The monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of this periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV Rheinland

(China) Ltd herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

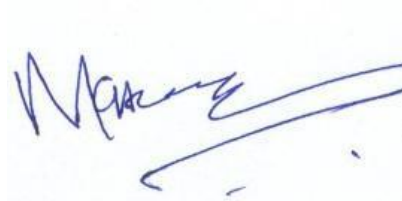
Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
April 2010- Dec 2010	83,537	0	0	83,537
Jan 2011- Dec 2011	71,115	0	0	71,115
Jan 2012 - Dec 2012	69,853	0	0	69,853
Jan 2013 - Mar 2013	90,077	0	0	90,077
Jan 2014- Mar 2014	15,237	0	0	15,237
Total	329,819	0	0	329,819

Prepared by:

Approved by:

Date: 28-November-2015

Date: 29-November-2015



Mr. Ma Paa Puratchikkanal
Team Leader
TUV Rheinland (India) Pvt. Ltd



Mr. Nick Stantzos
DOE Manager
TUV Rheinland (China) Ltd

APPENDIX 1: LIST OF DOCUMENTS REFERRED

Reference	Documents
/P01/	Monitoring Report dated 22/09/2014 for the reporting monitoring period, Version 1.0.
/P02	Monitoring Report dated 26/05/2015 for the reporting monitoring period, Version 02.
/P03/	Emission reduction calculation spread sheet /P01/.
/P04/	Emission reduction calculation spread sheet /P02/.
/P05/	1. All Calibration / testing reports for all the energy meters covering the reported monitoring period. 2. Competency proof of the calibrating agencies.
/P06/	Copy of commissioning certificates of all the WTGs of the project activity.
/P07/	Copy of Power purchase agreements between the PP and the relevant state electricity utility corresponding to the all WTGs of the project activity
/P08/	Credit report/Joint meter reading report corresponding to the WTGs of the project activity covering the monitoring period.
/P09/	Copy of monthly invoices covering the monitoring period.
/P10/	Organization Chart clearly showing roles and responsibilities.
/P11/	Monthly and Daily generation reports at the WTG controller point for all the WTGs of the project activity covering the reported monitoring period.
/P12/	Spread sheet with list of Meters (meters used for the monitoring of the electricity supplied to grid) covering details - make, meter serial number, accuracy class and feeder/SS for all the connected feeders to which WTGs of the project activity is Connected.
/P13/	1. Valid Operation and Management Agreement for all the WTGs of the project activity 2. Maintenance agreement for all the WTGs of the project activity
/P14/	Site layout plan for the project activity WTGs, showing the Sub-station, feeders and other WTGs (Non PPs) for each of the sub-station feeders to which the WTGs of the project is connected.
/P15/	Photographs of the following:

	1. All WTGs of the project activity with unique identification numbers. 2. Electricity Meters (S. No., make and accuracy class should be clearly readable) corresponding to the WTGs of the project activity. 3. Evacuation systems with which each of the WTGs of the project activity are connected.
/P16/	Training records of O & M team during the reported monitoring period.
/P17/	Right of Use (Right of use as per definition of VCS version 3) for the project activity (as per the section 8.1 of the validated VCS PD /B02/).
/P18/	Technical specification of the WTGs of the project activity.
/P19/	1. Contract of the PP complying para 3.7.2 of the VCS standard. 2. Validation Statement issued by “Tuev Nord Cert GmbH (Tuev Nord)”

Background investigation and assessment documents:

Reference	Documents
/B01/	Applied baseline and monitoring methodology for the VCS project activity, i.e., ACM0002, Ver09.
/B02/	Final VCS PD for the project: “53.75 MW Bundled wind Power project in Tamil Nadu and Karnataka by KBD Group, India”
/B03/	Validation Report for the project “53.75 MW Bundled wind Power project in Tamil Nadu and Karnataka by KBD Group, India” issued by Tuev Nord Cert GmbH (Tuv Nord).
/B04/	VCS Version 3; Program Guidelines; VCSA Rules; and VCS Guidance Document.
/B05/	Validation and Verification Standard, Version 9.0
/B06/	ISO 14064-2: ISO 14064-3: ISO 14065
/B07/	GHG Protocol for Project accounting Chap 7
/B08/	http://unfccc.cdm.int
/B09/	www.v-c-s.org

APPENDIX 2: LIST OF REQUESTS FOR CORRECTIVE ACTION (CAR) AND CLARIFICATION (CL)

No.	Type of request	Observation	Summary of project owner response	Verification team conclusion
1.	/CAR-01/	From the review of MR /P01/, verification team has found that the name of the project is not consistent within the MR.	The project title has been retained consistent in the revised MR.	DOE Assessment#1: The changes have been made correctly. The project name is consistent throughout the MR. CAR 01 is closed.
2.	/CAR-02/	Verification team has found that the MR /P01/ is not correctly filled as per the requirement of the MR template available under VCS. PP need to follow the MR form.	PP response#1: MR template has been corrected and updated	DOE Assessment#1: The applied MR form is acceptable. CAR-02 is closed.
3	/CAR-03/	From the review of the MR /P01/, verification team has found that the section 1.3 of the MR is not filled correctly.	PP response#1: In the revised MR, the section 1.3: project proponent details have been corrected .	DOE Assessment#1: The corrections were checked to be OK. CAR-03 is closed.

4	/CAR-04/	Since combined margin factor is directly used for the emission reduction calculation and fixed ex-ante. PP need to include the same under section 3.1 of the MR /P01/.	PP response#1: The combined margin factor has been included in section 3.1 of the revised MR	DOE Assessment#1: The applied combined margin emission factor value is checked to be in consistent with VCS PD. Hence CAR-04 is closed.
5	/CAR-05/	PP need to provide all the monitoring parameters as given in the PDD /B02/. Also the monitoring parameter table given in the MR /P01/ is not correctly filled as per the requirement of the MR template	PP response#1: All the monitoring parameters have been included in the revised MR. All the monitoring parameter has been included in section 3.2 of the revise MR	DOE Assessment#1: The monitoring parameters were in line with VCS PD and assessed to be appropriate. CAR-05 is closed.
6	/CAR-06/	From the review of the MR /P01/, verification team has found that the futuristic sentences have used in the MR. Since the verification is the period which is already monitored, PP need to check the same.	The futuristic sentence has been corrected in section 1.1 of the revised MR.	The errors have been rectified. Hence CAR-06 is closed. CAR-06 is closed.

APPENDIX 3: ABBREVIATIONS

§	Para
%	Percentage
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction(s)
CL	Clarification request
CO ₂	Carbon dioxide
CO _{2e}	Carbon dioxide equivalent
DCS	Digital Control System
DOE	Designated Operational Entity
ESC	Energy Sale Contract
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
kW	Kilo Watt
LAN	Local Area Network
MP	Monitoring Plan
MR	Monitoring Report
MW	Mega Watt
O&M	Operation and Maintenance
PA	Project Activity
PO	Project Owner
PP	Project Participant
PPA	Power Purchase Agreement
QA/QC	Quality Assurance and Quality control
S.No	Serial Number
TPM	Total Productive Maintenance
UNFCCC	United Nation Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCS-PD	Verified Carbon Standard Project Document
VVS	Validation and Verification Standard

APPENDIX 4: TEAM MEMBERS QUALIFICATION

Qualification

MP, Kanal /

Emission Trading

United Nations Framework Convention on Climate Change

(The following data is set by the certification body)

Auditor No.:

(AuditorenRegNr)

Appointed: (Zugelassen)	ja	Qualification Level: (Qualifikationsstufe)	Lead Auditor
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External: (Externer)	Add. reviewer: (Zusätzlicher Prüfer)
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EAC Scopes: (EAC Branchen)	CDM 01 - Energy industries (renewable - / non-renewable sources)
	CDM 03 - Energy demand
	CDM 06 - Construction
	CDM 13 - Waste handling and disposal
	CDM 15 - Agriculture

Add.
qualification:
(zus. Qualifikation)

First Appointment: (Erstberufung)	02-06-2012	Valid to: (Gültig bis)	02-05-2015
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Remarks:	TA. 1.2, 3.1, 6.1, 13.1/13.2, 15.1
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Languages:	English
	Tamil
	Hindi

Qualification

C, Indumathi /

Emission Trading

United Nations Framework Convention on Climate Change

(The following data is set by the certification body)

Auditor No.:

(AuditorenRegNr)

Appointed:	ja	Qualification	Lead Auditor
(Zugelassen)		Level:	
		(Qualifikationsstufe)	

External:	Add. reviewer: yes
(Externer)	(Zusätzlicher Prüfer)

EAC Scopes:	CDM 01 - Energy industries (renewable - / non-renewable sources)
(EAC Branchen)	

Add.
qualification:
(zus. Qualifikation)

First	06-07-2012	Valid to:	06-05-2015
Appointment:		(Gültig bis)	
(Erstberufung)			

Remarks:	TA 1.2
Languages:	Tamil
	English
	Hindi

Qualification

Sharma, Chetan Swaroop /

Emission Trading

United Nations Framework Convention on Climate Change

Auditor No.:
(AuditorenRegNr)

Appointed: (Zugelassen)	☒ ja	Qualification Level: (Qualifikationsstufe)	Lead Auditor
External: (Externer)	☐ ja	Add. reviewer: (Zusätzlicher Prüfer)	☐ yes
EAC Scopes: (EAC Branchen)	CDM 01 - Energy industries (renewable - / non-renewable sources)		
Add. qualification: (zus. Qualifikation)	Gold Standard Webinars		
First Appointment: (Erstberufung)	20-10-2009	Valid to: (Gültig bis)	18-10-2015

Remarks: T.A 1.2

Languages: Hindi
English

Experience Exchange

Date	Location	Remarks	Accreditation(s)
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Monitoring

Latest Monitoring:
(letzte Beurteilung)

Next Monitoring:
(nächste Beurteilung)

Remarks:

[View / Edit Monitoring](#)

History of scope allocation

Date: 2013-01-11
Change: EAC CDM added
By: Praveen Urs
Reason:

Date: 2011-05-30