

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



TÜV NORD CERT GmbH
JI/CDM Certification Program
Langemarckstraße, 20
45141 Essen, Germany
Phone: +49-201-825-3335
Fax: +49-201-825-3290
www.tuev-nord.de
www.global-warming.de

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Prepared By	TÜV NORD CERT GmbH
Contact	Langemarckstraße, 20 45141 Essen, Germany Phone: +49-201-825-3335 Fax: +49-201-825-3290 www.tuev-nord.de www.global-warming.de
Approved By	Ingo Klein
Work Carried Out By	Mr. Ma.Paa.Puratchikkanal Ms. Sahana C.A Ms. Manjari Chandra Mr. N. Premjit Singh Mr. Kewat Shailendra

Summary:

M/s. Sapthagiri Distilleries Private Limited has commissioned the TÜV NORD JI/CDM Certification Program to carry out the verification of the project - "53.75 MW Bundled wind Power project in Tamil Nadu and Karnataka by KBD Group, India", in India with regard to the requirements of VCS, v3.1.

The project activity generates electricity utilizing wind power, which will be supplied to the Southern Grid of India and then distributed to connected end users, thus achieving GHG emission reduction.

Monitoring period: From 2006-10-01 to 2010-03-31 (incl. both days)

A risk based approach has been followed to perform this verification. In the course of the verification 02 Corrective Action Requests (CAR) and 01 Clarification request (CL) were raised and successfully closed out. No Forward Action Request (FAR) was raised during the VCS validation.

The verification is based on the draft monitoring report, revised monitoring report and the monitoring plan as set out in the validated PD, the validation report, emission reduction calculation spreadsheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

During the first verification the following deviation has been foreseen and justified adequately and is in line with the EB 52 Annex 60: "Guidelines for Assessing Compliance with the Calibration Frequency Requirements" and the monitoring methodology,

1. The calibration frequency mentioned in the validated PD is not followed strictly. So the PP has applied maximum permissible error of 0.2% & 0.5% to export and import values in order to calculate the share of electricity for individual investor for emission reduction calculation.

The calibration frequency in further crediting periods until 2016-09-30 will be in line with EB 54, Annex 14: 'Indicative Simplified Baseline and Monitoring Methodologies for Selected Small-scale CDM Project Activity Categories', Version 13, point (c) 12.

If any deviation in the calibration frequency is found during further crediting periods, then the project activity is liable to apply EB 52, Annex 60 guidelines.

The deviation during this 1st periodic verification will not cause increase in emission reduction, change in the project activity, capacity of the project and description as mentioned in the validated PD.

As the result of the 1st periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Emission reductions	296,258	t CO ₂ equivalents
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Table of Contents

Pages

1	Introduction.....	4
1.1	Objective.....	4
1.2	Scope and Criteria.....	4
1.3	Level of assurance	4
1.4	Summary Description of the Project	5
2	VALIDATION PROCESS, FINDINGS AND CONCLUSION.....	22
2.1	Validation Process.....	22
2.2	Validation Findings.....	23
2.2.1	Gap Validation.....	23
2.2.2	Methodology Deviations	23
2.2.3	New Project Activity Instances	23
2.3	Validation Conclusion	23
3	VERIFICATION PROCESS.....	23
3.1	Method and Criteria.....	23
3.2	Document Review.....	24
3.3	Interviews	24
3.4	Site Inspections	25
3.5	Resolution of Any Material Discrepancy.....	27
4	VERIFICATION FINDINGS	27
4.1	Project Implementation Status.....	28
4.2	Accuracy of GHG Emission Reduction or Removal Calculations.....	30
4.3	Quality of Evidence to Determine GHG Emission Reductions or Removals.....	34
4.4	Management and Operational System	35
5	VERIFICATION CONCLUSION	37
6	REFERENCES	39

1 INTRODUCTION

The M/s Resurge Energy Private Limited has commissioned the TÜV NORD JI/CDM Certification Program 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 relevant requirements of the Voluntary Carbon Standard v3.1^{/VCS/}. The verifiers have reviewed the implementation of the monitoring plan (MP) in the registered VCS project for the monitoring period 2006-10-01 to 2010-03-31 (incl. both days),

The applied monitoring methodology is ACM 0002, version 09 - “Consolidated Methodology for grid connected electricity generation from renewable sources”.

1.1 Objective

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

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

1.2 Scope and Criteria

The verification of this project is based on the validated project design document ^{/VCS-PD/}, the monitoring report ^{/MR2/}, emission reduction calculation spread sheet ^{/XLS2/}, 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 JI/CDM CP has employed a risk-based approach in the verification, focusing on the identification of significant risks and reliability of project monitoring and generation of emission reductions.

1.3 Level of assurance

The verification has been planned and organized to achieve a

☒ Reasonable level of assurance

☐ Limited level of assurance

1.4 Summary Description of the Project

a. Project Characteristics:

Essential data of the project is presented in the following Table.

Table: Project Characteristics

Item	Data			
Project title	53.75 MW Bundled wind Power project in Tamil Nadu and Karnataka by KBD Group, India			
Project owner	M/s. Sapthagiri Distilleries Private Limited			
Any specific project categories	☐ Mega project ($> 10^6$ t CO _{2eq} / a) ☒ Project (> 5000 t CO _{2eq} / a and $< 10^6$ t CO _{2eq} / a) ☐ Micro project (< 5000 t CO _{2eq} / a) ☐ AFOLU project ☐ Grouped project ☐ No specific project category			
VCS PD dated	Draft:	2009-06-19	Final:	2009-10-22
Applied Methodology	ACM0002, Version 09: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"			
Project starting date	2006-09-29			
Crediting period	☐ Renewable Crediting Period (7 y) ☒ Fixed Crediting Period (10 y)			
Start of crediting period	2006-10-01			

b. Project Location:

The details of the project location are given in the table below:

Table: Project Location

No.	Project Location
Host Country	India

No.	Project Location
Region:	Karnataka and Tamil Nadu
Project location address:	Dindigul, Coimbatore and Erode districts of Tamil Nadu and Hassan and Gadag districts of Karnataka, India
Latitude:	Has been provided for each WEG in the table below
Longitude:	Has been provided for each WEG in the table below

S.No.	Unique ID	HT SC No.	Capacity (kW)	SF No.	Latitude ¹	Longitude ²	Taluka	Project proponent
1	Q 195	1312	1250	709, Kundadam	N10° 50' 07.9"	E77° 25' 58.7"	Palladam	KBDL
2	Q 211	1329	1250	804/1(P), 2(P), 805(P), Kundadam	N10° 48' 59.1"	E77° 25' 54.9"	Palladam	
3	G 81	1337	1250	178(P)Chinnapudhur	N10°44'30.9"	E77°25' 40.6"	Palladam	
4	G 89	1336	1250	136(P)	N10° 43' 31.0"	E77° 25' 51.5"	Palladam	
5	G 936	1442	1500	576/2D(P).2E(P)	N10° 33'46.0"	E77° 19' 19.0"	Palladam	SDPL (Tamil Nadu)
6	G 938	1440	1500	2(P)	N10° 33'45.4"	E77° 19' 47.1"	Palladam	
7	G 953	U 1441	1500		N10° 33'32.4"	E77° 18' 34.8"	Palladam	
8	R73	2155	1500	69/2A(Part)/69/2B9(Part) Udayathoor	N8° 17.383'	E77° 44.084'	Sankaneri	
9	R166	2317	1500	414/1B (Part) Udayathoor	N8° 14.466'	E77° 44.764'	Sankaneri	
10	R104	2309	1500	75/ 3B(Part), 132/1(Part)	N8° 17.343'	E77° 44.865'	Sankaneri	

¹ <http://www.satsig.net/maps/lat-long-finder.htm>

² <http://www.satsig.net/maps/lat-long-finder.htm>

				Udayathoor				
1 1	R116	2310	1500	153/3A(P), 3B(P), 3C(P), 3D(P) Udayathoor	N8 ⁰ 16.728'	E77 ⁰ 45.629'	Sankaneri	
1 2	R124	2311	1500	179/5 (Part) Udayathoor	N8 ⁰ 16.024'	E77 ⁰ 45.860'	Sankaneri	
1 3	R134	2312	1500	175/5(p), Udayathoor	N8 ⁰ 16.036'	E77 ⁰ 45.513'	Sankaneri	
1 4	R138	2313	1500	218/2 (Part) Udayathoor	N8 ⁰ 15.610'	E77 ⁰ 45.302'	Sankaneri	
1 5	R173	2314	1500	153/1 (Part) Vijaypathy	N8 ⁰ 14.014'	E77 ⁰ 45.702'	Sankaneri	
1 6	R180	2315	1500	144/1 (Part) Vijay pathy	N8 ⁰ 13.753'	E77 ⁰ 45.703'	Sankaneri	
1 6	R178	2316	1500	87/1 (Part) Vijaypathy	N8 ⁰ 13.681'	E77 ⁰ 45.199'	Sankaneri	
1 8	R187	2318	1500	5 (Part) Vijaypathy	N8 ⁰ 13.397'	E77 ⁰ 43.764'	Sankaneri	
1 9	R181	2325	1500	10/2 (Part) Vijaypathy	N8 ⁰ 13.627'	E77 ⁰ 43.759'	Sankaneri	
2 0	H23	HSN /TL& SS/ WF/ H23/ 04	1500	1 Rangapurakava lu	N 76 ⁰ 11' 50.6"	E 13 ⁰ 10' 81.6"	Arasikere	SDPL (Karn ataka)
2 1	H24	HSN /TL& SS/ WF/ H23/ 04	1500		N 76 ⁰ 11' 26.6"	E 13 ⁰ 10' 57.5"	Arasikere	
2 2	K310	GDG /TL& SS/ WF/ SDP LK/K - 311/ 89	1500	72, 77 Keluru	N15 ⁰ 08' 38.6"	E 75 ⁰ 46' 49.8"	Mundargi	
2 3	K311	GDG /TL& SS/ WF/	1500		N15 ⁰ 08' 18.3"	E 75 ⁰ 47' 15.5"	Mundargi	

		SDP LK/K - 311/ 89						
2 4	G 335	D 8	600	357 Muthu Naicken Patti	N10° 35' 40.2"	E77° 24' 26.2"	Palladam	D.K. Audik esavu lu
2 5	G 344	D 5	600	227 Muthu Naicken Patti	N10° 35' 30.9"	E77° 25' 01.9"	Palladam	
2 6	G 369	D 11	600	311/2	N10° 35' 05.4"	E77° 25' 13.8"	Palladam	
2 7	G 340	D 4	600	341/4 Muthu Naicken Patti	N10° 35' 21.5"	E77° 24' 41.6"	Palladam	
2 8	G 342	D 13	600	356 Muthu Naicken Patti	N10° 35' 34.9"	E77° 24' 39.2"	Palladam	
2 9	G 374	D 7	600	386/1 Muthu Naicken Patti	N10° 35' 01.3"	E77° 24' 20.5"	Palladam	
3 0	G 367	D 14	600	408/1B Muthu Naicken Patti	N10° 35' 01.7"	E77° 24' 44.2"	Palladam	
3 1	G 366	D 6	600	352/2	N10° 35' 05.9"	E77° 24' 33.1"	Palladam	
3 2	G 541	D 16	600	494/1C Kozhumankond am	N10° 34' 42.6"	E77° 26' 54.1"	Palladam	
3 3	G 543	D 21	600	500/3 Melakaraipatti	N10° 34' 33.9"	E77° 26' 55.6"	Palladam	
3 4	G 545	D 19	600	494/1C Kozhumankond am	N10° 34' 26.9"	E77° 27' 07.8"	Palladam	
3 5	G 546	D 17	600	143 Kozhumankond am	N10° 34' 24.3"	E77° 26' 54.4"	Palladam	
3 6	G 438	D 20	600	233/1(P), 288/1(P). 2C1(P) Kozhumankond am	N10° 33' 38.3"	E77° 26' 13.1"	Palladam	

37	G 476	D 25	600	500/1C(P), 2C(P) Kozhumankond am	N10° 32' 51.3"	E77° 26' 08.0"	Palladam	
38	G 460	D 22	600	495/2A(P), 2B(P), 492/2(P) Kozhumankond am	N10° 33' 11.9"	E77° 26' 22.6"	Palladam	
39	G 420	D 23	600	478/2A(P) Kozhumankond am	N10° 32' 43.7"	E77° 26' 31.5"	Palladam	
40	G 471	D 24	600	20/1B(P), 2B(P), 21/1B(P) Puspathur	N10° 32' 54.5"	E77° 25' 00.3"	Palladam	
41	G 536	D 12	600	114/8A, 8B Puspathur	N10° 32' 57.1"	E77° 24' 40.6"	Palladam	
42	G 407	D 10	600	123/11 Puspathur	N10° 33' 04.3"	E77° 24' 33.3"	Palladam	
43	247(T))	G 897/ 10	750	178/7, Sampavarvadak arai	N9° 01' 29.2"	E77° 24' 00.6"	Surandai	D.A. Satya prabh a
44	303(T))	G 897/ 18	750	125/7 (p),/8 (p)/9(p)10(p), Sampavarvadak arai	N9° 00' 58.1"	E77° 24' 44.4"	Surandai	
45	350(T))	G 897/ 19	750	44/2,3,4(P), Sampavarvadak arai	N9° 01' 06.3"	E77° 22' 45.5"	Surandai	
46	73(T)	G 897/ 8	750	287/(p), Alagiapandiapur am	N9° 01' 23.9"	E77° 31' 34.8"	Surandai	
47	72(T)	G 897/ 9	750	210/1a(p), Alagiapandiapur am	N9° 01' 05.6"	E77° 30' 29.7"	Surandai	
48	351(T))	2270 /TIN	750	145/10, 11, 12, 13, 14, 15, 16(P) Navaneethakris hnapuram	N8° 56' 27.6"	E77° 38' 06.4"	Surandai	D.A.S riniva s
49	332(T))	2306 /TIN	750	144/3, 4 Navaneethakris hnapuram	N9° 01' 25.9"	E77° 32' 01.5"	Surandai	

50	302(T)	2289 TIN	750	415/1A, 1B, 2 Keelakalanganal	N8° 56' 26.8"	E77° 38' 41.9"	Surandai
51	331(T)	2307	750	378/ 2(P), 3(P) Keelakalanganal	N9° 01' 13.7"	E77° 30' 28.8"	Surandai
52	G 399	D 9	600	72/2B (P)	N10° 33' 24.3"	E77° 24' 02.9"	Palladam
53	R107	2170	1500	133/1(part)Udayathoor	N8° 17.297'	E77° 45.182'	Sankaneri

c. Technical Project Description:

The proposed project utilizes wind power for electricity generation. Total installed capacity is 53.75 MW (WEGs of 20 X 1.50 MW, 4 X 1.25 MW, 9 X 0.75 MW & 20 X 0.60 MW) by means of which 320,517 MWh of net electricity is supplied to the Southern grid during this monitoring period from 2006-10-01 to 2010-03-31. This project is equipped with WTGs developed by Suzlon make S-66 for the 1.25 MW, S-82 for the 1.50 MW, S-52 for the 0.6 MW and Vestas NM48 for 0.75 MW for power generation. The project has been commissioned and is in operation since 2006-09-29.

Supporting documents like purchase orders^{/PO/} of the WTGs were made available to the TÜV NORD JI/CDM CP. It was found that the purchase order^{/PO/} issued by the suppliers of the WTGs specifies the technical details for the respective WTG. Information was also collected through performing interviews with the PP and during the on-site assessment.

The key parameters of the project are given in the below tables:

Table: Technical data of the project

Technical Specification of Suzlon S-66/1250 kW WEG	
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
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 Specification of Suzlon S-82/1500 kW WEG	
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 Specification of Suzlon S-52/600 kW WEG	
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 Specification of Vestas NM48/750 kW WEG

ROTOR

Diameter	48.2 m
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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

d. Parameters confirmed during verification:

During the monitoring period (2006-10-01 to 2010-03-31) the project activity has exported a total net electricity of 320,517 MWh. Due to delayed calibration of the energy meters correction factor has been applied to the electricity generated by the project activity for calculating the emission reductions. The total baseline emission comes to 296,258 tCO_{2e}.

The on-site visit was carried out on 2010-06-14 & 2010-06-16.

During the on-site visit, the monitoring parameters provided under section 9 of the monitoring report^{/MR/} and under sub-section 3.3 of the validated PD^{/PD3/} were verified for each WEG along with their respective joint meter reading^{/JMR/} reports, which have been duly signed by the representatives of KPTCL and invoice copies^{/INV/} raised by the project proponent to KPTCL. The monitoring parameters are found to be in line with the monitoring plan^{/PD3/ & /MR/} & the PPA^{/PPA1-PPA53/} signed for the project and are deemed to be OK.

		Parameter	Name & Unit	Value in kWh
WTG-wise generation breakup in this project activity	1. 1312	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	7,954,600.80
	2. 1329	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	7,450,970.64
	3. 1337	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	8,202,085.20
	4. 1336	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	3,890,972.64
	5. D 8	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	3,127,696.45
	6. D 5	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	3,433,311.75
	7. D 11	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	3,502,728.48
	8. D 4	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	3,543,589.90

		Parameter	Name & Unit	Value in kWh
	9. D 13	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	3,301,356.63
	10. D 7	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	3,380,796.20
	11. D 14	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	3,336,601.75
	12. D 6	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	3,557,143.58
	13. D 16	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	3,943,419.65
	14. D 21	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	4,155,684.75
	15. D 19	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	3,816,721.80
	16. D 17	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	4,268,005.15
	17. D 20	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	3,828,142.40

		Parameter	Name & Unit	Value in kWh
	18. D 25	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	3,783,234.20
	19. D 22	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	4,079,393.52
	20. D 23	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	3,759,222.24
	21. D 24	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	3,697,878.45
	22. D 12	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	3,642,547.25
	23. D 10	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	3,523,882.64
	24. U 1441	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	9,117,511.50
	25. 2155	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	9,602,613.24
	26. 2317	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	9,355,942.44

		Parameter	Name & Unit	Value in kWh
	27. 2309	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	9,791,219.16
	28. 2310	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	9,743,759.40
	29. 2311	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	10,827,820.68
	30. 2313	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	8,131,262.40
	31. 2314	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	8,862,957.36
	32. 2315	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	9,558,365.40
	33. 2316	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	10,551,144.24
	34. 2318	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	8,439,077.64
	35. 2325	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	8,026,616.76

		Parameter	Name & Unit	Value in kWh
	36. 2319/TI N	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	4,013,722.80
	37. 2320/TI N	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	4,144,045.74
	38. 2321/TI N	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	4,362,199.20
	39. 2233/TI N	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	3,732,333.54
	40. 2232/TI N	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	3,838,455.12
	41. 2270/TI N	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	4,745,932.74
	42. 2306/TI N	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	4,640,899.74
	43. 2289/TI N	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	3,985,663.26

		Parameter	Name & Unit	Value in kWh
	44. 2307	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	4,459,217.52
	45. D 9	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	3,622,246.32
	46. 2170	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	8,550,599.64
	47. 1440	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	8,046,072.00
	48. 1442	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	8,618,710.30
	49. 2312	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	9,082,834.68
	50. H-23 & H-24	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	20,266,176.96
	51. K-310 & K-311	EGy	Net electricity supplied to Southern grid by the project activity in this monitoring period	15,219,224.12
Parameters as per	H-23 & H-24	TEGy	Total electricity generated by the project activity (i.e. Export), TEGy, kWh	20,829,600.00

		Parameter	Name & Unit	Value in kWh
monthly invoices of sale to state utilities (HESCO M/ GESCO M) / Monthly JMR Reports (Form-B) for the WTGs connect ed to substati ons related to this project activity		EGI	Electricity imported by the project activity, EGI, kWh	97,168.95
		EGT-I	Transmission loss (or line loss) incurred by the project activity during import of electricity, EGT-I, kWh	12,648.91
		EGT-E	Transmission loss (or line loss) incurred by the project activity during export of electricity, EGT-E, kWh	424,594.89
	K-310 & K-311	TEGy	Total electricity generated by the project activity (i.e. Export), TEGy, kWh	15,729,621.60
		EGI	Electricity imported by the project activity, EGI, kWh	151,575.06
		EGT-I	Transmission loss (or line loss) incurred by the project activity during import of electricity, EGT-I, kWh	19,755.00
		EGT-E	Transmission loss (or line loss) incurred by the project activity during export of electricity, EGT-E, kWh	358,822.42

It was verified in the course of this verification that the actual project activity was implemented in accordance with the Validated PD^{/PD/}.

e. Appointment of team members and technical reviewer:

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

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

Table: Involved Personnel

	Name	Company	Function ¹⁾	Qualification Status ²⁾	Scheme competence	Technical competence ⁴⁾	Host country Competence	Team Leading competence	On-site visit
☒ Mr. ☐ Ms.	Ma.Paa.Puratc hikkanal	TUV INDIA Private Ltd.	TL	SA	☒	1.2	☒	☒	☒
☐ Mr. ☒ Ms.	Sahana C.A	TUV INDIA Private Ltd.	TM	A	☒	1.2	☒	☐	☒
☒ Mr. ☐ Ms.	N. Premjit Singh	TUV INDIA Private Ltd.	TM	A	☒	1.2	☒	☐	☐
☐ Mr. ☒ Ms.	Manjari Chandra	TUV INDIA Private Ltd.	TM	A	☒	1.2	☒	☐	☐
☒ Mr. ☐ Ms.	Shailendra Kewat	TUV INDIA Private Ltd.	TM	A	☒	1.2	☒	☐	☒
☒ Mr. ☐ Ms.	Oliver Bley	TN CERT GmbH	OR ³⁾	T	☐	-	☐	☐	-
☒ Mr. ☐ Ms.	Heiner Lenzian	TN CERT GmbH	TR ³⁾	A	☒	1.2.2	☐	☐	-
☒ Mr. ☐ Ms.	Ingo Klein	TN CERT GmbH	FA ³⁾	SA	☒	1.2.2	☐	☒	-

¹⁾ TL : Team Leader; TM : Team Member, TR: Technical review; FA: Final approval; OR: Observer, Technical Review

²⁾ GHG Auditor Status: A : Assessor; E : Expert; SA: Senior Assessor; T : Trainee; TE Technical Expert

³⁾ No team member

⁴⁾ As per S01-MU03 or S01-VA070 A2 (such as A, B, C.....)

2 VALIDATION PROCESS, FINDINGS AND CONCLUSION

2.1 Validation Process

There was no gap validation of the project conducted during this monitoring period. Verification of this project is based on already validated project document ^{/VCS-PD/} dated

20/05/2009, Validation report dated 25/05/2009^{/FValR/} and the Validation statement^{/VCS-STAI/} dated 28/05/2009.

2.2 Validation Findings

2.2.1 Gap Validation

NA

2.2.2 Methodology Deviations

NA

2.2.3 New Project Activity Instances

NA

2.3 Validation Conclusion

Please refer Validation report dated 25/05/2009^{/FValR/}.

3 VERIFICATION PROCESS

3.1 Method and Criteria

The verification of the project consisted of the following steps:

- Contract review
- Appointment of team members and technical reviewers
- Publication of the monitoring report
- Desk review of the Monitoring Report^{/MR1/} 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.

The sequence of the verification is given in the table below:

Table: Verification sequence

Topic	Time
Assignment of verification	2010-05-17
On-site visit	2010-06-14 & 2010-06-16
Draft reporting finalised	2011-05-13
Technical review on draft reporting finalised	2011-05-18
Final reporting finalised	2011-05-18
Technical review on final reporting finalised	2011-10-05
Final corrections	2011-10-06

3.2 Document Review

The VCS PD ^{/PD/} and supporting background documents related to the project design and baseline were reviewed.

Furthermore, the verification team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data.

The references used in the course of this verification are summarized in section 6.

3.3 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.

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 Table below.

Table: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
1. Projects & Operations Personnel- /IM01/	- General aspects of the project - Project design, Commissioning and implementation - Technical equipment and operation of the project - Performance of the project - Involved personnel and responsibilities - Training and practice of the operational

Interviewed Persons / Entities	Interview topics
2. Consultants- /IM02/	personnel - Implementation of the monitoring plan - Monitoring and measurement equipment - QA/QC Testing and calibration procedures - Monitored data management - Data quality, archiving and reporting procedures - Desk review findings - Bundling criteria - Applicability of chosen methodology - Data uncertainty and residual risks - GHG calculation - Procedural aspects of the validation

A comprehensive list of all interviewed persons is part of section 6 'References'.

3.4 Site Inspections

During on-site inspection, following tasks were carried out;

a. Review of Performance Records:

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/testing 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.

Responsibilities related to monitoring are executed as defined in the monitoring plan^{/PDI & /MR2/} and were assessed and found to be OK.

The on-site audit was carried out on 2010-06-14 & 2010-06-16. Two members of the Verification team attended the site visit.

b. Information on Collection of Measurements:

As per the monitoring procedure mentioned in ACM0002 methodology the data/parameters are rightly monitored. The parameters monitored in this project activity are from two states, i.e., Karnataka and Tamil Nadu. In Karnataka, the monitoring parameters include Total electricity generated by the project activity (i.e. Export) (TEGy), Electricity imported by the project activity (EG_I), Transmission loss (or line loss) incurred by the project activity during import of electricity (EG_{T-I}), Transmission loss (or line loss) incurred by the project activity during export of electricity (EG_{T-E}) & Net electricity supplied to the regional electricity grid (EGy). In Tamil Nadu, the monitoring parameter is Net electricity supplied to Southern grid by the project activity in this monitoring period (EGy). Electricity is measured every month using these monitoring parameters and summarized in the joint meter reading^{/JMR/} reports and invoice copies^{/INV/} raised by the project proponent to TNEB & KPTCL, which are the sources of data used for emission reduction calculation as per the approved monitoring plan provided in the validated PD^{/PD3/}.

The energy generated in the project activity was supplied to the TNEB in Tamil Nadu and CESC Mysore/HESCOM (Chamundeshwari Electricity Supply Corporation Limited/ Hubli Electricity Supply Company Limited), a subsidiary of KPTCL in Karnataka (which are under Southern Grid) during the reported monitoring period and is in line with the validated VCS PD^{/PD3/}.

During the on-site visit, the verification team has checked the metering system, monitoring procedures and has performed interviews with the TNEB, KPTCL personnel and also with the O&M personnel of Suzlon Infrastructure Services Ltd and Vestas Wind Technology India Private Limited in the respective states, to confirm the energy measurement procedure and resolve issues identified in the document review.

All the procedure followed in the site are found to be in line with the monitoring plan^{/PD3/} & the PPA^{/PPA1-PPA53/} signed for the project and deemed to be OK.

c. Observation of established practices and testing of the accuracy of monitoring equipment:

Monthly energy meter recordings of Net electricity supplied to Southern grid by the project activity (EGy) in Tamil Nadu and Total electricity generated by the project activity (i.e. Export) (TEGy) & Electricity imported by the project activity (EG_I) taken by the KPTCL personnel in Karnataka in the presence of PP representative was confirmed during on-site visit by means of interview with the monitoring personnel of KPTCL and TNEB. This was also verified by the joint meter reading^{/JMR/} reports which have been duly signed by the representatives of KPTCL and TNEB, which were issued to PP for raising invoice. Also, the parameters Transmission loss (or line loss) incurred by the project activity during import of electricity (EG_{T-I}), Transmission loss (or line loss) incurred by the project activity during export of electricity (EG_{T-E}) & Net electricity supplied to the regional electricity grid (EGy) in Karnataka were confirmed by verifying the monthly invoices^{/INV/} raised by the project proponent to KPTCL. The procedure followed for preparation of JMR is as per the PPA^{/PPA1-PPA53/} signed between the PP and KPTCL. All required

instruments and operating procedures for the same have been implemented in an appropriate manner. Responsibilities related to monitoring are executed as defined in the monitoring plan^{/PD3/} & ^{/MR/}. Calibration/testing of the energy meters are carried out by KPTCL and TNEB. Calibration procedures of all online energy meters covering the reported monitoring period were verified for their frequency and traceability to industry standards. The calibration of the measuring equipments have been conducted during the monitoring period of 2006-10-01 to 2010-03-31 with some inconsistencies in the duration which are not in line with the validated PD^{/PD3/}. Hence, deviation during this 1st verification has been foreseen. Detailed information on this has been elaborated under section 3.4 of this report.

Available Calibration records^{/Cal/} of all installed meters were checked and found OK. The monitoring system is in compliance with the applied monitoring methodology (ACM 0002 version 9).

3.5 Resolution of Any Material Discrepancy

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

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

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

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

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

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

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 summarised. Table below includes an overview of all raised CARs, CLs and FARs.

Table: Overview of CARs, CLs and FARs issued

No.	Topic / Chapter	CAR	CL	FAR
4.1	Project implementation status	1	1	-

4.2	Accuracy of GHG emission reduction or removal calculations	1	-	-
4.3	Quality of evidence to determine GHG emission reductions or removals	-	-	-
4.4	Management and operational system	-	-	-
-	SUM	2	1	0

4.1 Project Implementation Status

Description

The project activity is located in the districts of Dindigul, Coimbatore and Erode in the State of Tamil Nadu and in the districts of Hassan and Gadag in the State of Karnataka, India. The project utilizes wind power for electricity generation by 53 WEGs. Location details of WEGs are mentioned in table 1-2 under section 1.3.2 of this report. Total installed capacity of the project activity is 53.75 MW (20 X 1.50 MW, 4 X 1.25 MW, 9 X 0.75 MW & 20 X 0.60 MW). The project is generating energy from wind resources, thereby displacing electricity generated using existing fossil fuel based power plants or future capacity additions in the State of Karnataka and Tamil Nadu. These two states are part of the country's Southern Grid. During the monitoring period of 2006-10-01 to 2010-03-31, the project activity has exported a total net electricity of 320,517 MWh and thus the total baseline emissions come to 296,258 tCO_{2e}.

The parameters to monitor in this project activity are Total electricity generated by the project activity (i.e. Export) (TEGy), Electricity imported by the project activity (EG_i), Transmission loss (or line loss) incurred by the project activity during import of electricity (EG_{T-I}), Transmission loss (or line loss) incurred by the project activity during export of electricity (EG_{T-E}) & Net electricity supplied to the regional electricity grid (EGy) for the WEGs in Karnataka and Net electricity supplied to the southern grid by the project activity (EGy) for the WEGs in Tamil Nadu.

In the project activity, TEGy & EG_i for Karnataka WEGs are being measured once in a month with a high accuracy and duly tested class 0.2 power meters installed at each WEG and at the grid substation, which are jointly monitored by the project participant and KPTCL. Whereas, energy in Tamil Nadu is measured with 0.5 accuracy class power meters at each WEG. The meters are tested by KPTCL and TNEB before commissioning. At the time of commissioning the meter is sealed by the officials. The meters are connected through feeders to the grid substation belonging to this project activity. These meters are tri-vector meters, which can measure both power delivered to the grid and received from the grid. As per Article 7 of the Karnataka PPA^{/PPA1-PPA4/}, in the event that the Main metering system is not in service as a result of maintenance or repairs, then the Backup metering system or Check meter shall be used and the provisions shall apply to the reading of the backup metering system until the Main meter is fit for service. The PPA^{/PPA5-PPA53/} terms of Tamil Nadu under Article 7 reads in the event that the Main meter is not

in service or repair, this faulty meter will be duly replaced immediately with information to the concerned Authority. For the faulty meter- in case of the electricity board meter, electricity board assigns reading based on the performance of nearby similar capacity machines. The same is conservative and will be used for the ER calculation as well. During this monitoring period, the main meters in both the states were in service as is evident from the joint meter reading^{/JMR/} reports provided by KPTCL and TNEB every month, which have been taken from the main metering system.

The joint meter reading^{/JMR/} reports and monthly invoice^{/INV/} copies have been submitted by the PP to the DOE for the entire monitoring period and were verified. All the procedure followed in the site are found to be in line with the monitoring plan^{/PD3/} & the PPA^{/PPA1-PPA53/} signed for the project.

There are no remaining issues or any material discrepancy from previous validation. All raised CARs and CLs were successfully closed during the Validation of the project design. The Verification has been carried out based on the Validated PD^{/PD3/}, Monitoring report^{/MR/}, Validation report^{/VR/}, Emission reduction calculation sheet^{/ER/} and supporting documents.

It was verified in the course of this verification that the actual project activity was implemented in accordance with the Validated PD.

Related Findings

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

Finding:	4.1-1		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Technical details of WTGs involved in this project activity are not provided in the Monitoring report. The geographical coordinates of WTGs in Karnataka with location numbers H23 & H24 do not correlate with the said WTGs. Give reasons.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The MR is updated accordingly. Revised geological coordinates of the WTGs have been submitted in the revised MR after confirmation from the WTG supplier, M/s. Suzlon. The WTGs are also seen in the submitted snapshot from Google Earth.		

DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The technical description of all the WTGs involved in this project activity has been provided under section 6 of the revised monitoring report. The snapshot from the Google Earth confirms the geographical coordinates that have been revised in the MR. Hence, CL 4.1-1 is closed.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Final Assessment

During this verification a site visit was carried out. The project activity is implemented as per the validated PD. The technical detail of wind turbines of this project activity was verified from the records of the O&M at the site and is found to be OK.

The geographical coordinates of the WTGs H23 & H24 are changed from the validated PD, as they were not matching with the exact locations of the WTGs. Now, revised coordinates have been included in the MR and the same have been verified from the satellite imagery available from the Google Earth. They are found to be OK.

☒ CL 4.1-1 is closed.

Finding:	4.1-1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	It is found that not all the monitoring parameters have been presented under section 9 of the Monitoring report and in the emission reduction sheet when compared to Validated PD. Also, the monitoring parameters that are presented in the monitoring report are not consistent with the Validated PD.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The monitoring parameters in the monitoring report are revised according to the validated PD. The same has been incorporated in the revised ER sheet.		

DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The revised monitoring report and VER calculation sheet have been verified to check for the consistency in the monitoring parameters and for the calculation of Net electricity supplied to the regional electricity grid and hence the emission reductions. Corrections have been carried out in the monitoring report and the VER calculation sheet in accordance to the corrective action raised and is found to be OK.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Final Assessment

The reporting^{/MR/ /ER/} is in line with the requirements of the validated monitoring plan as well as with the applied methodology ACM0002 version 9^{/ACM0002/}. The reporting procedures reflect the requirements of the monitoring plan^{/PD3/}. No significant, lack of evidence and missing data were detected during this monitoring period and found to be OK.

☒ CAR 4.1-1 is closed.

4.2 Accuracy of GHG Emission Reduction or Removal Calculations

Description

The value of the emission reductions depends on the Net electricity supplied to Southern grid by the project activity (EGy) in Tamil Nadu and Net electricity supplied to the grid by the project activity per annum (EGy) in Karnataka, which is the difference between Total electricity generated by the project activity (i.e. Export) (TEGy), Electricity imported by the project activity (EG_i), Transmission loss (or line loss) incurred by the project activity during import of electricity (EG_{T-I}) and Transmission loss (or line loss) incurred by the project activity during export of electricity (EG_{T-E}). The project emissions are zero as there is no use of any fossil fuel. As the project activity does not involve power plant construction, fuel handling (extraction, processing, and transport), and land inundation, the leakage due to the project activity is not applicable as per ACM0002. Therefore the baseline emission equals the Emission Reductions. The total net electricity supplied by the 53 WEGs during the monitoring period of 2006-10-01 to 2010-03-31 is 320,517 MWh. The baseline emission factor has been fixed ex-ante as 0.9269 (tCO₂/MWh) based on the CEA data base version 4.0 for Southern Grid^{/CEA/}. Based on the Net electricity supplied to the grid by the project activity per annum (EGy) and the emission factor the baseline emissions are 296,258 tCO_{2e}.

Following the ACM0002 methodology, the combined margin (CM) value of 0.9269 tCO₂/MWh calculated ex-ante was chosen to calculate the baseline emission factor.

Both the values of Simple Operating Margin and Build Margin are selected under ex-ante approach. The grid boundary w.r.t the connected state grid is in Southern Grid of India. The calculation of EF_y was publicly available and published by the Central Electricity Authority on its web-site^{/cea/} and fixed ex-ante during the entire crediting period.

In the project activity total electricity generated is being measured by energy meters installed near WEG as well as at the sub-stations, which is jointly monitored by the project participant and KPTCL.

Since the calibration of the measuring equipments had not been conducted every annual during the monitoring period of 2006-10-01 to 2010-03-31, the PP has referred to EB 52 Annex 60: "Guidelines for Assessing Compliance with the Calibration Frequency Requirements" and adjusted with the maximum (0.2% and 0.5%) error limit to all the monitoring parameters stated in the validated PD for the purpose to achieve net electricity supplied to the grid by the project activity and ER calculation thereof during the monitoring period. The details on the same have been elaborated under section 9 in the revised Monitoring report^{/MR/} and the revised emission reduction sheet^{/ER/}. This deviation during the first verification has been foreseen and justified adequately.

The Verification team has checked the input values as well as the computation in the emission reduction spreadsheet^{/ER/}. The emission reduction has been computed in a transparent and conservative manner.

Related Findings

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

Finding:	4.2-1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in un-ambiguous style; address the context (e.g. section)</i>	It is found from the monitoring report that there is inconsistency in the duration of calibration of meters covered in this project activity during the reported monitoring period. Also, the project activity during this monitoring period is not found to have properly applied the correction factors as per EB 52, Annex 60, for the uncovered period of calibration to arrive at the net generation from the project activity.		

Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The period that is not covered under calibration has been presented in detail for each WEG under section 9.7 of the revised monitoring report. The correction factor as per EB 52, Annex 60 has been applied for this monitoring period and the revised emission reduction sheet has been submitted to the DOE.
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The revised monitoring report and VER calculation sheet have been verified to check for the application of correction factor as per EB 52, Annex 60 during the reported monitoring period and hence for the calculation of Net electricity supplied to the grid by the project activity and the emission reductions. Corrections have been carried out in the monitoring report and the VER calculation sheet in accordance to the corrective action raised and is found to be OK.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Final Assessment

VER calculation sheet and the monitoring report have been submitted by the project proponent that presents the calibration details and the period of application of correction factor as per EB 52, Annex 60. They are found to be OK.

It was found that the meters were not calibrated for accuracy once in a year during the monitoring period. This deviation during this first verification has been foreseen and PP has justified adequately by following the latest EB guidelines for calibration^{/EB52-A60/}. The maximum permissible error has been applied for conservative approach of emission reduction calculation and has been presented in the emission reduction sheet^{/ER/}. Thus, all the procedures applied during this verification period are found to be in line with the methodology, VCS requirement and guidelines on calibration which results in a transparent and conservative approach of emission reduction calculation. The verification team is convinced of the result of the emission coefficient calculation and emission reduction calculation^{/ER/}. The net electricity supplied to the grid by the project activity for individual investor mentioned in the emission reduction spread sheet (summary sheet) and monitoring report is valid and accurate since the data was provided and authenticated by KPTCL and TNEB. The emission factor of 0.9269 tCO₂/MWh was fixed ex-ante in the validated PD and the same has been applied throughout the crediting period. The PP has applied point no 4 (a) of EB 52, annexure 60 for conservative approach to calculate the emission reduction. This deviation is applicable for this monitoring period and until the end of the crediting period till 2016-09-30. This deviation will not cause increase in emission reduction, change in the project activity, capacity of the project and description as mentioned in the validated PD.

The information provided by the PP during the verification stage such as joint meter readings^{/JMR/}, monthly invoice^{/INV/} copies and calibration certificates^{/Cal/} were verified. It is concluded that all the information provided in the emission reduction calculation are found to be valid and correct.

☒ CAR 4.2-1 is closed.

4.3 Quality of Evidence to Determine GHG Emission Reductions or Removals

Description

Proper data management including data acquisition and aggregation, data management system is being followed for the project activity.

The net electricity supplied to the grid by the project activity per annum is taken from the monthly invoices^{/INV/} raised by the project proponent to KPTCL and TNEB based on the joint meter reading^{/JMR/} reports of respective months, which forms the basis for emission reduction calculations. The amount of electricity generated from the project activity and dispatched to the grid is continuously metered by TNEB and KPTCL energy meter. The meters are Tri-vector energy meters with an accuracy class of 0.2 and 0.5, which can measure both import and export. The energy meter readings are noted in presence of officials from both WEG owners and electricity board personnel of KPTCL and TNEB. The data provided by KPTCL and TNEB are authentic based on which project proponent raises the invoices. The meters are calibrated by state electricity board ensuring error free measurements. Also, the log books that are maintained by the Operation & Maintenance personnel (Suzlon Infrastructure Services Limited and Vestas Wind Technology India Private Limited) will be verified by the site main controller of the respective WEG and the same will be forwarded to the project head. If any major deviation between the recorded generation values for each WEG by the O&M personnel and the net electricity value, that is presented in the JMR by KPTCL or TNEB, the same would be informed to electricity board for further action as to re-check the meter recordings/any defect in the metering system which may require calibration, etc.

All monitored data are archived in physical and electronic form. The data will be kept for the whole crediting period and additional 2 years as given in the PD^{/PD3/}. No significant, lack of evidence and missing data were detected during on-site verification.

Related Findings

☒ No CARs, CLs or FARs have been identified in this context

☐ The following finding(s) have been addressed:

Final assessment

The data calculated/considered in this project activity is accurate, conservative and transparent. It is found to be valid and acceptable.

4.4 Management and Operational System

Description

The allocation of responsibilities is documented in a written form and has been verified. Routines for the archiving of data are defined and documented.

The authority of the project site is given to the O&M personnel of M/s. Suzlon Infrastructure Services Limited and M/s. Vestas Wind Technology India Private Limited for the respective WEGs. The organizational structure includes Site Main Controller who is responsible for O & M monitoring and coordinating with Operation and Maintenance Contractor of the O & M team for smooth functioning of WEGs. He is also responsible for recording the required monitored parameters along with the KPTCL/TNEB officials and to report the monitoring results to the project head.

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 during the on-site visit. Procedure for training and maintenance of critical equipments were also discussed. It was found that a person who is appointed as part of the O&M team will be put for training for a period of 6 months during his initial period of appointment, where he will be trained in all the aspects of maintenance of the WEGs along with data storage and handling of errors, etc. Appropriate training requirements are provided to the O&M personnel and proper allocation of responsibilities is being followed. Day to day operation is supervised by the technically qualified site engineers and 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. Training would be provided to the concern personnel as required i.e., during the initial appointment period or during the requirement of closure of any non-conformity raised during the internal audits, etc. Thus, they are competent to carry out the relevant tasks with sufficient accuracy. All necessary monitored and measured raw data were checked during on-site verification.

All internal data are subjected to QA/QC measures. During the site visit the verification team has analyzed the QA/QC procedures established by the O&M provider and reviewed the energy measurement procedures. The O&M provider has a separate online database for the energy generation for each WTG and the same can be verified in their control monitoring system (CMS). The CMS is equipped with SCADA software to monitor all the parameters such as energy generation, wind speed, rotor speed, angle of the blade, emergency alarm, generator temperature etc. Thus SCADA is a robust technology and the O&M providers, M/s. Suzlon Infrastructure Services Limited and M/s. Vestas Wind Technology India Private Limited are an ISO certified organisations and they have followed the procedure to keep all the records in a systematic manner. The investor is provided with a secret user name and

password to access the website for verifying the energy generation of her WTGs. Also the energy generation details are sent to the customer from the O&M provider through e-mail. All monitored data are archived in Physical and Electronic form. 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.

The QA/QC measures were found acceptable by verifying the daily generation log books and also in the electronic form for WEGs. The daily generation details were also verified through each customer database by the DOE.

Related Findings

☒ No CARs, CLs or FARs have been identified in this context

☐ The following finding(s) have been addressed:

Final Assessment

The allocation of responsibilities is documented in a written form and is followed as described in the validated PD^{/PD3/}. Calculations laid down in the monitoring report are in line with validated PD^{/PD3/}.

During on-site visit the verification team confirmed that the monitoring and reporting are carried out consistently and are in line with established procedures as mentioned in the monitoring plan of the validated PD^{/PD3/}.

5 VERIFICATION CONCLUSION

M/s. Sapthagiri Distilleries Private Limited has commissioned the TÜV NORD JI/CDM Certification Program to carry out the verification of the project - "53.75 MW Bundled wind Power project in Tamil Nadu and Karnataka by KBD Group, India", in India with regard to the requirements of VCS v3.1.

The electricity generated by this project activity will be sold to the local electricity distribution company as per KERC (Karnataka Electricity Regulatory Commission) guidelines and TERC (Tamil Nadu Electricity Regulatory Commission) guidelines, by entering into Power Purchase Agreements with the concerned Distribution Company of KPTCL and TNEB, which are part of Southern Grid of India. The energy thus sold to KPTCL and TNEB will be then distributed to connect end users and thus achieving GHG emission reduction.

The significant deviation happened during this monitoring period is the KPTCL and TNEB have not strictly followed the calibration frequency of the energy meters which need to be calibrated at least once in a year. Hence the verification team has taken care and assessed the conservative calculation approach of emission reduction provided by the PP and is found to be in line with EB 52, annex 60. The calibration frequency in further crediting periods until 2016-09-30 will be in line with EB 54, Annex 14: 'Indicative Simplified Baseline and Monitoring Methodologies for Selected Small-scale CDM Project Activity Categories', Version 13, point (c) 12. If any deviation in the calibration frequency is found during further crediting periods, then the project activity is liable to apply EB 52, Annex 60 guidelines. Deviation is also happened w.r.t the mention of WTG specific geographical coordinates of Karnataka (H23 & H24). Proper geographical coordinates are provided during this monitoring period and would continue with the same until 2016-09-30.

The deviation during this 1st verification period will not cause increase in emission reduction, change in the project activity, capacity of the project and description as mentioned in the validated PD.

Monitoring period: From 2006-10-01 to 2010-03-31 (incl. both days)

A risk based approach has been followed to perform this verification. In the course of the verification two (02) Corrective Action Requests (CAR) and one (01) Clarification Request (CL) were raised and successfully closed out.

The verification is based on the draft monitoring report, revised monitoring report, the monitoring plan as set out in the validated PD, the validation report, emission reduction calculation spreadsheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

In detail the conclusions can be summarised as follows:

- all operations of the project are implemented and installed as planned and described in the validated project description.
- The monitoring plan is transparent, adequate and in line with applied baseline and

monitoring methodology of ACM0002, Version 09.

- the installed equipments essential for measuring parameters required for calculating emission reductions are calibrated appropriately.
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of the 1st periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Monitoring Period	Total achieved VCUs
October 2006 to December 2006	0
Total for the year 2006	0
Jan 2007 to December 2007	86428
Total for the year 2007	86428
Jan 2008 to December 2008	102485
Total for the year 2008	102485
Jan 2009 to December 2009	100104
Total for the year 2009	100104
Jan 2010 to March 2010	7241
Total for the year 2010	7241
TOTAL (tCO₂e)	296,258

Baseline emissions	296,258 t CO ₂ equivalents
Project emissions	0 t CO ₂ equivalents
Leakage emissions	0 t CO ₂ equivalents
Emission reductions	296,258 t CO₂ equivalents

Bangalore, 2011-10-06



Ma. Paa. Puratchikkanal
TÜV India Pvt Ltd
Verification Team Leader

Essen, 2011-10-06



TÜV NORD JI/CDM Certification Program
Final Approval

6 REFERENCES

Table 6-1: Documents provided by the project participant

Reference	Document
/Cal/	Calibration reports issued by KPTCL and TNEB for the 53 WEGs of the project activity
/CR1- CR53/	Commissioning certificates of all the 53 WTGs from the TNEB and KPTCL
/TD/	Technical specification of the WTGs.
/PPA1-PPA53/	Power Purchase Agreements between TNEB/CESC Mysore/HESCOM and the respective PP for all the 53 WTGs
/PO/	Purchase orders for all the 53 WTGs of the project activity
/JMR/	Joint meter reading reports for all the 53 WTGs
/O&M/	Operation & Maintenance agreement for all the 53 WTGs between M/s. Sapthagiri Distilleries Private Limited and M/s. Suzlon Infrastructure Services Limited and M/s. Vestas Wind Technology India Private Limited.
/ER/	- Emission reduction calculation spread sheet, version 01 - Emission reduction calculation spread sheet, version 02
/MR/	- Monitoring report, version 01 “53.75 MW Bundled wind Power project in Tamil Nadu and Karnataka by KBD Group, India”, dated 8/06/2010 - Monitoring report, version 02 “353.75 MW Bundled wind Power project in Tamil Nadu and Karnataka by KBD Group, India”, dated 16/05/2011
/PD3/	VCS PD for M/s. Sapthagiri Distilleries Private Limited dated at 2009/10/22, Version 3
FValR	Final validation report dated 2009/11/15
/INV/	Invoice copies submitted to KPTCL and TNEB by the PP for each month of the monitoring period
/VCS-STAI	VCS validation statement

Table 6-2: Background investigation and assessment documents

Reference	Document
/ACM 0002/	Indicative simplified baseline and monitoring methodologies for selected large-scale CDM project activity categories (Version 9)
/ACM 0002/	Tool for the demonstration and assessment of additionality (Version 05.2)
/CB Meth tool/	Tool to calculate the emission factor for an electricity system (Version 01.1)
/IPPC-RM/	1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book
/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/ISO 14064/	Greenhouse gases -- Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals Greenhouse gases -- Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements Greenhouse gases -- Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions
/ISO14065/	Greenhouse gases -- Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition
VCS	Voluntary Carbon Standard version 3.1
/VDS-PD-T/	VCS PD Template
/VVM/	Validation and Verification Manual (Version as per EB51)
/EB52-A60/	Guidelines For Assessing Compliance With The Calibration Frequency Requirements

Table 6-3: Websites used

Reference	Link	Organisation
/cd4cdm/	www.cd4cdm.org	UNEP Riso Centre
/ipcc/	www.ipcc-nggip.iges.or.jp	IPCC publications
/vcs/	www.v-c-s.org	VCSA
/unfccc/	http://cdm.unfccc.int	UNFCCC

Table 6-4: List of interviewed persons

Reference		Name	Organisation / Function
/IM01/	☒ Mr. ☐ Ms.	Mr. P.S. Chakrapani	Financial Advisor, M/s. Sapthagiri Distilleries Private Limited
/IM02/	☒ Mr. ☐ Ms.	Mr. Pravin Jadhav	AVP, General Carbon Advisory Services Pvt. Ltd. Mumbai

¹⁾ Means of Interview: (Telephone, E-Mail, Visit)