

**MONITORING REPORT FORM (F-CDM-MR)**
Version 02.0**MONITORING REPORT**

Title of the project activity	Enercon Wind Farms in Karnataka Bundled Project – 73.60 MW
Reference number of the project activity	1286
Version number of the monitoring report	01
Completion date of the monitoring report	22/11/2012
Registration date of the project activity	01/07/2010
Monitoring period number and duration of this monitoring period	Third, 01/06/2012-30/09/2012(Inclusive of first and last day)
Project participant(s)	Enercon (India) Limited, Japan Carbon Finance Ltd.
Host Party(ies)	Govt. of India (Host)
Sectoral scope(s) and applied methodology(ies)	Energy industries (renewable/ non-renewable sources). 'Consolidated baseline methodology for grid-connected electricity generation from renewable sources', ACM0002, Version 06 and 'consolidated monitoring methodology for grid-connected electricity generation from renewable sources', ACM 0002, Version 06
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	Average value of CER/ year (or 365 days) as per PDD are 159,244. Current monitoring period (01/06/2012-30/09/2012) covers period of 122 days, hence ex-ante estimated of CER's as per the PDD are 53227.
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	100501 (Actual GHG emission reductions under 3 rd Monitoring period, Duration: 01/06/2012-30/09/2012 (Inclusive of first and last day))

SECTION A. Description of project activity**A.1. Purpose and general description of project activity**

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- (a) *Purpose of the project activity and the measures taken for GHG emission reductions or net anthropogenic GHG removals by sinks;*

The objective of project is development, design, engineering, procurement, finance, construction, operation and maintenance of Enercon Wind Farm (Krishna) Ltd 15 MW, Enercon Wind Farm (Karnataka) Ltd 3.2 MW and other wind power projects of 55.40 MW capacity ("Project") in the Indian state of Karnataka to provide reliable, renewable power to the Karnataka state electricity grid which is part of the Southern regional electricity grid. The Project will lead to reduced greenhouse gas emissions because it displaces electricity from fossil fuel based electricity generation plants.

- (b) *Brief description of the installed technology and equipments;*

The Project involves 64 wind energy converters (WECs) of Enercon make E-40 (600 kW) and 44 WECs of Enercon make E-48 (800 kW) totaling to 108 WECs. Enercon (India) Ltd (EIL) is the turbine supplier and is the operations and maintenance contractor.

- (c) *Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods, etc.);*

The WECs under the project activity were commissioned between 2⁴ September 2004 and 4th May 2006. The expected operational lifetime of the project is for 20 years. The project activity was registered as CDM project on 1st July 2010. The first monitoring period is from 1st July 2010 to 31st July 2011. The second monitoring period was from 1st August 2011 to 31st May 2012. The third monitoring period (current one) is from 1st June 2012 to 30th September 2012.

- (d) *Total GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period.*

The total emission reductions achieved under this monitoring period (1st June 2012 to 30th September 2012) are **100501 tCO₂**.

A.2. Location of project activity

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- (a) *Host Party(ies);*
India

- (b) *Region/State/Province, etc.;*
Karnataka State

- (c) *City/Town/Community, etc.;*
The project activity is located in the Chitradurga & Gadag Districts in the state of Karnataka, India.

- (d) *Physical/ Geographical location.*



Table-1:

S. No	Name of Customer	Individual Capacity (MW)	Site	R.R. NO.	Location No	Latitude			Longitude		
						Deg	Minutes	Second	Deg	Minutes	Second
1	MK Agrotech Private Ltd	0.6	Vanivilas Sagar	VVS 43	10	76	29	27.00	13	52	15.50
2	MK Agrotech Private Ltd	0.6	Vanivilas Sagar	VVS 43	11	76	29	28.31	13	52	11.91
3	International Conveyors Ltd	0.6	Vanivilas Sagar	VVS 38	13	76	29	23.36	13	51	57.17
4	Swaraj PVC Pipes P. Ltd.	0.6	Vanivilas Sagar	VVS 39	14	76	29	24.00	13	51	53.74
5	I. G. E. (India)	0.6	Vanivilas Sagar	VVS 40	15	76	29	25.01	13	51	50.19
6	Shilpa Medicare Ltd	0.6	Vanivilas Sagar	VVS 41	18	76	29	27.80	13	51	39.01
7	Shilpa Medicare Ltd	0.6	Vanivilas Sagar	VVS 41	19	76	29	32.10	13	51	28.90
8	Unnathi Projects Ltd	0.6	Vanivilas Sagar	VVS 36	21	76	29	34.10	13	51	23.26
9	Unnathi Projects Ltd	0.6	Vanivilas Sagar	VVS 36	22	76	29	33.85	13	51	20.30
10	Unnathi Projects Ltd	0.6	Vanivilas Sagar	VVS 36	23	76	29	36.29	13	51	17.65
11	Amrit Bottlers	0.6	Vanivilas Sagar	VVS 42	24	76	29	36.94	13	51	14.58
12	Amrit Bottlers	0.6	Vanivilas Sagar	VVS 42	25	76	29	37.45	13	51	11.03
13	S.E.Investment	0.6	Vanivilas Sagar	VVS 35	28	76	29	40.08	13	51	1.16
14	Rohit Surfactants Pvt Ltd	0.6	Vanivilas Sagar	VVS 27	29	76	29	43.16	13	50	57.95
15	Rohit Surfactants Pvt Ltd	0.6	Vanivilas Sagar	VVS 27	30	76	29	44.41	13	50	54.72
16	Rohit Surfactants Pvt Ltd	0.6	Vanivilas Sagar	VVS 27	31	76	29	45.12	13	50	51.88
17	Rohit Surfactants Pvt Ltd	0.6	Vanivilas Sagar	VVS 27	32	76	29	46.27	13	50	49.47
18	S.E.Investment	0.6	Vanivilas Sagar	VVS 35	33	76	29	48.12	13	50	41.97
19	S.E.Investment	0.6	Vanivilas Sagar	VVS 35	34	76	29	49.84	13	50	39.13
20	Rohit Surfactants Pvt Ltd	0.6	Vanivilas Sagar	VVS 27	35	76	29	55.45	13	50	37.67
21	S.E.Investment	0.6	Vanivilas Sagar	VVS 35	37	76	29	53.97	13	50	29.25
22	Rohit Surfactants Pvt Ltd	0.6	Vanivilas Sagar	VVS 27	38	76	29	54.58	13	50	25.63



23	Rohit Surfactants Pvt Ltd	0.6	Vanivilas Sagar	VVS 27	39	76	29	55.82	13	50	21.95
24	Rohit Surfactants Pvt Ltd	0.6	Vanivilas Sagar	VVS 27	40	76	29	56.66	13	50	18.43
25	Rohit Surfactants Pvt Ltd	0.6	Vanivilas Sagar	VVS 27	41	76	29	57.74	13	50	14.48
26	Brindavan Agro	0.6	Vanivilas Sagar	VVS 33	42	76	29	58.71	13	50	10.83
27	Rohit Surfactants Pvt Ltd	0.6	Vanivilas Sagar	VVS 27	43	76	29	59.10	13	50	8.39
28	Brindavan Agro	0.6	Vanivilas Sagar	VVS 33	44	76	29	59.84	13	50	4.48
29	Patel Shanti Steels P. Ltd.	0.6	Vanivilas Sagar	VVS 32	47	76	30	2.59	13	49	51.64
30	Cooper Foundry	0.6	Vanivilas Sagar	VVS 26	48	76	30	9.48	13	49	46.59
31	Cooper Foundry	0.6	Vanivilas Sagar	VVS 26	49	76	30	9.79	13	49	42.32
32	Cooper Foundry	0.6	Vanivilas Sagar	VVS 26	50	76	30	10.50	13	49	38.93
33	Cooper Foundry	0.6	Vanivilas Sagar	VVS 26	51	76	30	10.88	13	49	36.75
34	Laxmi Organics	0.6	Vanivilas Sagar	VVS 25	52	76	30	12.08	13	49	31.54
35	Laxmi Organics	0.6	Vanivilas Sagar	VVS 25	53	76	30	12.99	13	49	27.69
36	Jitendra D. Majetha	0.6	Vanivilas Sagar	VVS 31	57	76	30	23.06	13	49	9.73
37	Patel Shanti Steels P. Ltd.	0.6	Vanivilas Sagar	VVS 21	72	76	30	58.20	13	47	42.69
38	Unnathi Projects Ltd	0.6	Vanivilas Sagar	VVS 30	73	76	30	59.38	13	47	39.40
39	Primetex Apparels India	0.6	Vanivilas Sagar	VVS 24	76	76	31	1.44	13	47	29.40
40	Neharaj Energy	0.8	GIM-II	ELP-2	2	76	28	32.73	13	58	15.64
41	Jubilee Textiles	0.8	GIM-II	ELP-3	3	76	28	29.82	13	58	18.10
42	Vivek Trading Company	0.8	GIM-II	ELP-11	4	76	28	27.14	13	58	21.08
43	Prasad Technology Park	0.8	GIM-II	ELP-18	10	76	28	11.45	13	58	53.68
44	Unnathi Projects Ltd	0.8	GIM-II	ELP-19	11	76	28	10.37	13	58	57.36
45	Prasad Technology Park	0.8	GIM-II	ELP-18	12	76	28	3.46	13	59	0.89
46	Avanti Feeds Ltd	0.8	GIM-II	ELP-4	13	76	27	59.21	13	59	7.52
47	Avanti Feeds Ltd	0.8	GIM-II	ELP-4	14	76	27	57.29	13	59	11.01
48	Avanti Feeds Ltd	0.8	GIM-II	ELP-4	15	76	27	58.49	13	59	15.43



49	Avanti Feeds Ltd	0.8	GIM-II	ELP-4	16	76	27	58.88	13	59	19.11
50	Srinivasa Cystine Ltd	0.8	GIM-II	ELP-5	17	76	27	58.74	13	59	22.95
51	Srinivasa Cystine Ltd	0.8	GIM-II	ELP-5	18	76	27	58.56	13	59	26.85
52	B.V.Finance and Leasing	0.8	GIM-II	ELP-6	19	76	27	53.77	13	59	33.72
53	B.V.Finance and Leasing	0.8	GIM-II	ELP-6	20	76	27	54.63	13	59	37.84
54	Amrit Bottlers	0.8	GIM-II	ELP 13	21	76	27	53.59	13	59	41.95
55	Brindavan Agro	0.8	GIM-II	ELP-7	22	76	27	51.71	13	59	45.44
56	Indian Power Corporation Ltd	0.8	GIM-II	ELP-15	23	76	27	54.87	13	59	49.52
57	Indian Power Corporation Ltd	0.8	GIM-II	ELP-15	24	76	27	57.13	13	59	52.67
58	Indian Power Corporation Ltd	0.8	GIM-II	ELP-15	25	76	27	55.72	13	59	56.52
59	Brindavan Agro	0.8	GIM-II	ELP-7	26	76	27	26.08	13	59	50.38
60	Brindavan Agro	0.8	GIM-II	ELP-7	27	76	27	27.18	13	59	43.87
61	Brindavan Agro	0.8	GIM-II	ELP-7	28	76	27	26.18	13	59	39.64
62	Indian Power Corporation Ltd	0.8	GIM-II	ELP-16	29	76	25	23.82	13	59	47.27
63	Indian Power Corporation Ltd	0.8	GIM-II	ELP-16	30	76	25	29.91	13	59	45.28
64	Indian Power Corporation Ltd	0.8	GIM-II	ELP-16	31	76	25	33.12	13	59	42.33
65	Indian Power Corporation Ltd	0.8	GIM-II	ELP-16	32	76	25	38.83	13	59	38.39
66	Indian Power Corporation Ltd	0.8	GIM-II	ELP-16	33	76	25	42.15	13	59	36.06
67	Indian Power Corporation Ltd	0.8	GIM-II	ELP-16	34	76	25	43.66	13	59	32.54
68	Mumbai Stock Brokers Pvt. Ltd.	0.8	Gim-II	ELP-21	40	76	24	8.45	13	59	48.78
69	D. R. Container Terminal	0.8	Gim-II	ELP-22	41	76	24	3.54	13	59	41.68
70	D. R. Container Terminal	0.8	GIM-II	ELP-22	42	76	23	40.29	13	59	37.55
71	Indian Power Corporation Ltd	0.8	GIM-II	ELP-26	52	76	25	11.40	13	59	15.90
72	Indian Power Corporation Ltd	0.8	GIM-II	ELP-26	53	76	25	13.08	13	59	12.35



73	Indian Power Corporation Ltd	0.8	GIM-II	ELP-26	54	76	25	15.36	13	59	9.01
74	Indian Power Corporation Ltd	0.8	GIM-II	ELP-26	55	76	25	17.30	13	59	5.46
75	Siddaganga Oil Extractions Ltd.	0.8	GIM-II	ELP-32	63	76	25	29.79	13	58	37.36
76	Siddaganga Oil Extractions Ltd.	0.8	GIM-II	ELP-32	64	76	25	31.94	13	58	34.06
77	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	1	75	44	15.11	15	11	48.10
78	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	2	75	44	17.51	15	11	44.22
79	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	3	75	44	18.61	15	11	41.19
80	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	4	75	44	18.89	15	11	37.80
81	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	5	75	44	16.41	15	11	35.01
82	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	6	75	43	31.81	15	12	48.51
83	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	7	75	43	50.49	15	12	41.81
84	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	8	75	43	52.29	15	12	38.71
85	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	9	75	43	55.60	15	12	35.29
86	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	10	75	44	23.26	15	13	17.08
87	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	11	75	44	2.08	15	12	29.80
88	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	12	75	44	10.74	15	11	52.99
89	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	13	75	44	11.63	15	11	50.29
90	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	14	75	44	23.69	15	13	14.09
91	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	15	75	44	23.30	15	13	9.40
92	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	16	75	44	21.78	15	13	6.22
93	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	17	75	44	20.10	15	13	3.59



94	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	18	75	44	19.52	15	13	0.10
95	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	19	75	44	18.39	15	12	54.90
96	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	20	75	44	19.29	15	12	52.10
97	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	21	75	44	18.00	15	12	49.11
98	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	22	75	44	20.00	15	12	45.39
99	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	23	75	44	20.39	15	12	42.01
100	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	24	75	44	4.59	15	12	27.41
101	Enercon Wind Farms (Krishna) Ltd	0.6	Gadag	EWKLH-6	25	75	44	3.61	15	12	24.29
102	Enercon Wind Farms (Karnataka) Ltd	0.8	Gadag	EWKLH-7	26	75	44	2.69	15	12	21.01
103	Enercon Wind Farms (Karnataka) Ltd	0.8	Gadag	EWKLH-7	27	75	43	57.98	15	12	16.99
104	Enercon Wind Farms (Karnataka) Ltd	0.8	Gadag	EWKLH-7	28	75	43	58.31	15	12	13.31
105	Enercon Wind Farms (Karnataka) Ltd	0.8	Gadag	EWKLH-7	29	75	44	1.71	15	12	10.30
106	Dinesh Pouches	0.8	EP-II	EP2-26	2	76	18	46.56	13	59	23.86
107	UshDev International	0.8	EP-II	EP2-24	3	76	18	49.11	13	59	14.58
108	UshDev International	0.8	EP-II	EP2-24	4	76	18	50.56	13	59	10.92
Total Capacity (MW)		73.6									

A.3. Parties and project participant(s)

Party involved (host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Government of India (Host)	Enercon (India) Ltd	No
Government of Japan	Japan Carbon Finance Ltd.	No

A.4. Reference of applied methodology

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- ‘Consolidated baseline methodology for grid-connected electricity generation from renewable sources’, **ACM0002, Version 06** and
- ‘Consolidated monitoring methodology for grid-connected electricity generation from renewable sources’, **ACM 0002, Version 06**

A.5. Crediting period of project activity

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Crediting period of the project activity is 10 years from 1st July 2010 to 30th June 2020 (Fixed).

SECTION B. Implementation of project activity**B.1. Description of implemented registered project activity**

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The Project involves 64 wind energy converters (WECs) of Enercon make 600 kW E-40 and 44 WECs of Enercon make 800 kW E-48 totalling 108 WECs connected with internal electrical lines connecting the Project with local evacuation facility. The WECs generates 3-phase power at 400V, which is stepped up to 33 KV. The Project can operate in the frequency range of 47.5–51.5 Hz and in the voltage range of 400 V \pm 12.5%. The other salient features of the state -of-art-technology are:

- Gearless Construction - Rotor & Generator Mounted on same shaft eliminating the Gearbox.
- Variable speed function – has the speed range of 18 to 33 RPM thereby ensuring optimum efficiency at all times.
- Variable Pitch functions ensuring maximum energy capture
- Near Unity Power Factor at all times
- Minimum draw (less than 1% of kWh generated) of Reactive Power from the grid
- No voltage peaks at any time
- Operating range of the WEC with voltage fluctuation of -20 to +20%
- Less Wear & Tear since the system eliminates mechanical brake, which are not needed due to low speed generator which runs at maximum speed of 33 rpm and uses Air Brakes
- Three Independent Braking Systems
- Generator achieving rated output at only 33 rpm
- Incorporates lightning protection system, which includes blades
- Starts Generation of power at wind speed of 3 m/s

The commissioning date for all the WECs included in the project activity is given in the table below.
Table-2:

S. No.	Name of Customer	Capacity (MW)	Site	Commissioning date
1	Neharaj Energy	0.8	GIM-II	29-Sep-05
2	Vivek Trading Company	0.8	GIM-II	30-Sep-05
3	Jubilee Textiles	0.8	GIM-II	29-Sep-05
4	Prasad Technology Park	1.6	GIM-II	31-Mar-06
5	SrinivasaCystine Ltd	1.6	GIM-II	29-Sep-05 & 30-Sep-05



6	Avanti Feeds Ltd	3.2	GIM-II	29-Sep-05
7	Siddaganga Oil Extractions Ltd.	1.6	GIM-II	31-Mar-06
8	Unnathi Projects Ltd	1.8	VanivilasSagar	30-Mar-05
9	Unnathi Projects Ltd	0.6	VanivilasSagar	23-Mar-05
10	B.V.Finance and Leasing	1.6	GIM-II	29-Sep-05 & 30-Sep-05
11	Shilpa Medicare Ltd	1.2	VanivilasSagar	30-Mar-05
12	Cooper Foundry	2.4	VanivilasSagar	30-Sep-04 & 14-Oct-04
13	I. G. E. (India)	0.6	VanivilasSagar	30-Mar-05
14	International Conveyors Ltd	0.6	VanivilasSagar	30-Mar-05
15	Jitendra D. Majetha	0.6	VanivilasSagar	23-Mar-05
16	Patel Shanti Steels P. Ltd.	0.6	VanivilasSagar	24-Sep-04
17	Patel Shanti Steels P. Ltd.	0.6	VanivilasSagar	23-Mar-05
18	Swaraj PVC Pipes P. Ltd.	0.6	VanivilasSagar	30-Mar-05
19	Amrit Bottlers	0.8	GIM-II	30-Sep-05
20	Amrit Bottlers	1.2	VanivilasSagar	30-Mar-05
21	Brindavan Agro	1.2	VanivilasSagar	23-Mar-05
22	Brindavan Agro	3.2	GIM-II	29-Sep-05 & 30-Sep-05
23	Rohit Surfactants Pvt Ltd	6	VanivilasSagar	30-Sep-04 & 30-Nov-04
24	Unnathi Projects Ltd	0.8	GIM-II	31-Mar-06
25	Primetex Apparels India	0.6	VanivilasSagar	30-Sep-04
26	MK Agrotech Private Ltd	1.2	VanivilasSagar	30-Mar-05
27	Laxmi Organics	1.2	VanivilasSagar	30-Sep-04 & 21-Oct-04
28	S.E.Investment	2.4	VanivilasSagar	23-Mar-05
29	Dinesh Pouches	0.8	EP-II	29-Mar-06



30	UshDev International	1.6	EP-II	29-Mar-06
31	Mumbai Stock Brokers Pvt. Ltd.	0.8	GIM-II	31-Mar-06
32	D. R. Container Terminal	1.6	GIM-II	31-Mar-06
33	Indian Power Corporation Ltd	2.4	GIM-II	15-Feb-06
34	Indian Power Corporation Ltd	4.8	GIM-II	15-Feb-06
35	Indian Power Corporation Ltd	3.2	GIM-II	31-Mar-06
36	Enercon Wind Farms (Karnataka) Ltd	3.2	Gadag	26-Mar-05
37	Enercon Wind Farms (Krishna) Ltd	15	Gadag	15-Mar-05

B.2. Post registration changes**B.2.1. Temporary deviations from registered monitoring plan or applied methodology**

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The deviation has been applied by the PP and was approved by UNFCCC on 21st March 2012
This deviation was applicable for first monitoring period only.

B.2.2. Corrections

>>

Not Applicable

B.2.3. Permanent changes from registered monitoring plan or applied methodology

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The revision in monitoring was applied and same was approved by UNFCCC on 16th February 2012.

B.2.4. Changes to project design of registered project activity

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Not Applicable

B.2.5. Changes to start date of crediting period

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Not Applicable

B.2.6. Types of changes specific to afforestation or reforestation project activity

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Not Applicable

SECTION C. Description of monitoring system

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Approved monitoring methodology ACM0002 / Version 06 Sectoral Scope: 1, “Consolidated monitoring methodology for zero-emissions grid-connected electricity generation from renewable sources”, by CDM - Meth Panel is proposed to be used to monitor the emission reductions.

This approved monitoring methodology requires monitoring of the following:

- Electricity generation from the project activity; and
- Operating margin emission factor and build margin emission factor of the grid, where *ex post* determination of grid emission factor has been chosen

Since the baseline methodology is based on *ex ante* determination of the baseline emission factor, the monitoring of operating margin emission factor and build margin emission factor is not required.

There is dedicated main and check meters for each of the sub projects included in the project activity at 33kV metering point. The feeders of 33 kV metering point are further connected to step up transformer at substation and subsequently to bulk meter at high voltage side of receiving substation. The bulk meters are connected to machines of the project activity and the machines commissioned by the other project developers.

The subprojects included in the project activity are connected to respective Enercon substations as shown in Appendix-1, where the bulk meters are located:

Therefore in order to determine the net electricity supplied to the grid by the project at high voltage side of receiving substation, the state utility applies the transmission loss to the meter reading recorded at the 33 KV metering point. The transmission loss calculated by the state utility is endorsed / confirmed jointly by the representatives of EIL and the state utility.

The procedure for calculation of transmission loss as given in the PPA is set-out below:

$$Z = (((X1+X2+X3.....+Xn)-Y)*100)/ (X1+X2+X3.....+Xn)$$

Z = Percentage transmission loss for export incurred in transmission line between the meters located at 33 kV metering point (including the machines of the project activity and other project developers) and the meters located at high voltage side (bulk meter: main and check) of receiving sub-station.

Summation of meter readings at 33 kV metering points for all the project developers connected to receiving substation (including the machines of the project activity and other project developers)
= (X1+X2+X3.....+Xn)

X_i (where, i can vary from 1 to n)= Energy Export Reading (X_i) noted at energy meter installed at 33kV metering point and represents the meters connected to project activity and other project developers. $X_1, X_2, X_3, \dots, X_n$ are the meters that are installed at 33kV metering point (including the machines of the project activity and other project developers) and further connected to the receiving substation by internally connected lines.

Y = Energy Export Reading at bulk meter installed at high voltage side of transformer of the receiving sub-station

The Export Reading is adjusted for transmission loss that is determined by the state utility as above is applied directly to the JMR (Form B) for each sub project included in the project activity taken at 33 kV metering point.

Transmission Loss in Export (**TE**) = Transmission Loss% (Z) * Energy Export at 33kV metering point (EG_{Export})

This calculated value of transmission loss (expressed in MWh) is shown in the JMR and can be verified.

In case of Energy Import, the state utility conservatively applies adjustment of 15% to the import values noted at 33 kV metering point.

Therefore, Energy Supplied to Grid for each of the sub projects is calculated after adjustment of actually calculated transmission loss to the electricity exported from which 115% import is deducted. Thus,

$EG_y(\text{Sub project}) = EG_{\text{export}} - 115\% * EG_{\text{import}} - \text{Transmission Loss (TE)}$

This is shown as the energy to be billed in the JMR recorded in FORM B.

The JMR in FORM B for each of the sub project noted at 33 KV metering location contains the following data:-

1. Present meter readings of main and check meters for export and import
2. Previous meter readings of the main and check meters for export and import
3. Multiplying constant
4. Energy exported / energy imported (difference of 1 and 2 multiplied by 3)
5. Transmission losses (calculated as above)
6. Energy to be billed (calculated as energy exported–transmission loss-115% import)
(reckoned as net energy generated and used for calculation of CER)

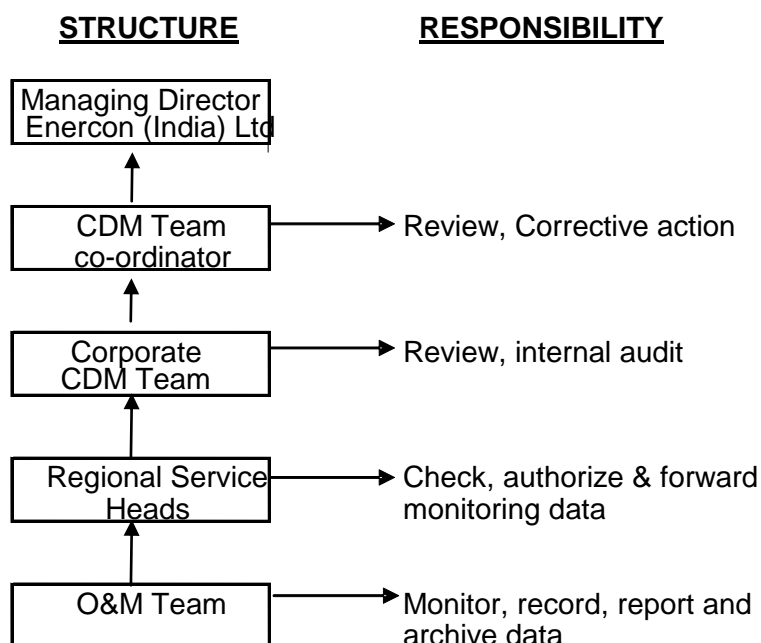
JMR is signed by the representatives of EIL and the state utility. The net electricity supplied to the grid can be cross checked from the invoices for each of the sub project raised on the state utility for supply of net electricity supplied to the grid.

In addition to the JMR (Form B) at 33kV metering location for each of the sub project included in the project activity as per details shown above, the following documents will also be provided to the DoE for verification:

1. JMR (Form B) at high voltage side of receiving sub-station(bulk meters: main and check).
2. Transmission loss calculation endorsed / confirmed jointly by the representatives of Enercon and the state utility.

Net electricity Supplied to Grid for the project activity is summation of Net electricity Supplied to Grid for each of the sub project included in the project activity.

The Project is operated and managed by Enercon (India) Ltd. The operational and management structure implemented by EIL is as follows:



Training and maintenance:

Training on the machine is an essential pre-requisite to ensure necessary safety of man and machine. Further, in order to maximize the output from the Wind Energy Converters (WECs), it is extremely essential that the engineers and technicians understand the machines and keep them in good health. In order to ensure that Enercon's service staffs is deft at handling technical snags on top of the turbine, the necessity of ensuring that they are capable of climbing the tower with absolute ease and comfort has been established. The Enercon Training Academy provides need-based training to meet the training requirements of Enercon projects. The training is contemporary, which results in imparting focused knowledge leading to value addition to the attitude and skills of all trainees. This ultimately leads to creativity in problem solving. The site personnel of EIL are also provided training about monitoring aspects of wind turbine performance; they are fully qualified to carry out all site duties such as preventive maintenance, operation controls and all monitoring processes.

- **Metering:** Electricity supplied to the grid is metered jointly by state utility and Enercon through dedicated main and check meters at 33 kV metering point for each of the sub project included in the project activity.

In addition to this there are main and check meters (Bulk meters) at high voltage side of receiving sub-station covering sub projects of the project activity and machines of other project developers. There are four receiving stations to which the sub projects included in the project activity are connected. The sub projects and the respective sub stations to which they are connected are presented in Appendix-1.

The schematic diagram shows location of meters for the project activity is attached as Appendix 1.

- **Metering Equipment:** Metering system for the project activity consists of main and check meters at 33kV metering point for each of the sub project included in the project activity and set(s) of main and check meters at high voltage side of receiving substation. All the meters are **two-way trivector meters capable of recording import and export of electricity**. The meters installed are capable of recording

and storing half hourly readings of the electrical parameters for a minimum period of 35 days with digital output.

- **Meter Readings:** The electricity export and import to the grid is recorded by taking a Joint Meter Reading (JMR) in the presence of Officials from state Utility and Enercon India Limited at 33kV metering point for each of the sub project included in the project activity. The Joint meter reading contains the value of energy imported, exported, transmission loss and the net electricity exported to the grid during the recording period. This Joint meter reading is certified by the Executive engineer of the state utility and by Enercon Officials. These certified readings are then used by the state utility to prepare the tariff invoices. Thus net electricity supplied to the grid for each of the sub project included in the project activity can be crosschecked with the value mentioned in the invoices raised on the state utility by each of the sub project included in the project activity
- **Inspection of Energy Meters:** All main and check energy meters and all associated instruments, transformers installed at the Project are of 0.2s accuracy class. Each meter is jointly inspected and sealed on behalf of the Parties and is not to be interfered with by either Party except in the presence of the other Party or its accredited representatives.
- **Meter Test Checking:** All main and check meters are tested (and calibrated if found necessary) for accuracy on annual basis with reference to a portable standard meter. The portable standard meter is owned by KPTCL. The main and check meters shall be deemed to be working satisfactorily if the errors are within specifications for meters of 0.2s accuracy class. The consumption registered by the main meters alone will hold good for the purpose of metering electricity supplied to the grid as long as the error in the main meters is within the permissible limits. All the meters will be tested / calibrated for accuracy annually.

If during the meter test checking,

- The main meter is found to be within the permissible limit of error and the corresponding check meter is beyond the permissible limits, then the meter reading will be as per the main meter as usual. The check meter shall, however, be calibrated immediately.
- The main meter is found to be beyond permissible limits of error, but the corresponding check meter is found to be within permissible of error, then the meter reading for the month up to the date and time of such test shall be as per the check meter. There will be a revision in the meter reading for the period from the previous calibration test up to the current test based on the readings of the check meter. The main meter shall be calibrated immediately and meter reading for the period thereafter till the next monthly meter reading shall be as per the calibrated main meter.
- Both the main meters and the corresponding check meters are found to be beyond the permissible limits of error, main and check meters shall be immediately calibrated and the correction applied to the reading registered by the main meter to arrive the correct reading of energy supplied for metering electricity supplied to the grid for the period from the last month's meter reading up to the current test. Meter reading for the period thereafter till the next monthly reading shall be as per the calibrated main meter.

Metering system details:

The metering arrangement for the project activity is given in the diagram in **Appendix 1**.

The details of meters installed at the site for measuring export and import by project activity are provided below:



Table-3:

S. No.	Name of Customer	Capacity (MW)	Site	R.R.NO.	Meter Make, Accuracy Class	Main Meter No.	Check Meter No.
1	Neharaj Energy	0.8	GIM-II	ELP-2	L & T, 0.2,	05342751	05342752
2	Vivek Trading Company	0.8	GIM-II	ELP-11	L & T, 0.2,	05342857	05342858
3	Jubilee Textiles	0.8	GIM-II	ELP-3	L & T, 0.2,	05342756	05342758
4	Prasad Technology Park	1.6	GIM-II	ELP-18	L & T, 0.2,	05271047	05271049
5	SrinivasaCystine Ltd	1.6	GIM-II	ELP-5	L & T, 0.2,	05341445	05341446
6	Avanti Feeds Ltd	3.2	GIM-II	ELP-4	L & T, 0.2,	05341447	05341448
7	Siddaganga Oil Extractions Ltd.	1.6	GIM-II	ELP-32	L & T, 0.2,	05436133	05436139
8	Unnathi Projects Ltd	1.8	Vanivila sSagar	VVS 36	L & T, 0.2,	05271060	05271059
9	Unnathi Projects Ltd	0.6	Vanivila sSagar	VVS 30	L & T, 0.2,	05271065	05271066
10	B.V.Finance and Leasing	1.6	GIM-II	ELP-6	L & T, 0.2,	05341441	05341450
11	Shilpa Medicare Ltd	1.2	Vanivila sSagar	VVS 41	L & T, 0.2,	05271043	05293305
12	Cooper Foundry	2.4	Vanivila sSagar	VVS 26	L & T, 0.2,	04219540	04219539
13	I. G. E. (India)	0.6	Vanivila sSagar	VVS 40	L & T, 0.2,	05293313	05271056
14	International Conveyors Ltd	0.6	Vanivila sSagar	VVS 38	L & T, 0.2,	05271044	05271048
15	Jitendra D. Majetha	0.6	Vanivila sSagar	VVS 31	L & T, 0.2,	05271053	05271054
16	Patel Shanti Steels P. Ltd.	0.6	Vanivila sSagar	VVS 21	L & T, 0.2,	04187660	04187668
17	Patel Shanti Steels P. Ltd.	0.6	Vanivila sSagar	VVS 32	L & T, 0.2,	05271050	05271051
18	Swaraj PVC Pipes P. Ltd.	0.6	Vanivila sSagar	VVS 39	L & T, 0.2,	05271045	07022947
19	Amrit Bottlers	0.8	GIM-II	ELP 13	L & T, 0.2,	05342863	05342864
20	Amrit Bottlers	1.2	Vanivila sSagar	VVS 42	L & T, 0.2,	05293302	05293303



21	Brindavan Agro	1.2	Vanivila sSagar	VVS 33	L & T, 0.2,	05271052	05271061
22	Brindavan Agro	3.2	GIM-II	ELP-7	L & T, 0.2,	05342859	05342860
23	Rohit Surfactants Pvt Ltd	6	Vanivila sSagar	VVS 27	L & T, 0.2,	04219529	04219545
24	Unnathi Projects Ltd	0.8	GIM-II	ELP-19	L & T, 0.2,	05390227	05390228
25	Primetex Apparels India	0.6	Vanivila sSagar	VVS 24	L & T, 0.2,	04186267	04219534
26	MK Agrotech Private Ltd	1.2	Vanivila sSagar	VVS 43	L & T, 0.2,	05389978	05293312
27	Laxmi Organics	1.2	Vanivila sSagar	VVS 25	L & T, 0.2,	04219547	04219580
28	S.E.Investment	2.4	Vanivila sSagar	VVS 35	L & T, 0.2,	06760776	05271068
29	Dinesh Pouches	0.8	EP-II	EP2-26	L & T, 0.2,	05463836	05463837
30	UshDev International	1.6	EP-II	EP2-24	L & T, 0.2,	05463965	05463972
31	Mumbai Stock Brokers Pvt. Ltd.	0.8	GIM-II	ELP-21	L & T, 0.2,	05389968	05389969
32	D. R. Container Terminal	1.6	GIM-II	ELP-22	L & T, 0.2,	05389976	05389980
33	Indian Power Corporation Ltd	2.4	GIM-II	ELP-15	L & T, 0.2,	05342757	05342759
34	Indian Power Corporation Ltd	4.8	GIM-II	ELP-16	L & T, 0.2,	05436134	05436138
35	Indian Power Corporation Ltd	3.2	GIM-II	ELP-26	L & T, 0.2,	05436125	05436128
36	Enercon Wind Farms (Karnataka) Ltd	3.2	Gadag	HBL/TL&SS/WF/EWKLH/07	L & T, 0.2,	06607750	05271064
37	Enercon Wind Farms (Krishna) Ltd	15	Gadag	HBL/TL&SS/WF/EWKLH/6	L & T, 0.2,	04259886	04259887

The details of meters installed at receiving station for the purpose of measuring and allotting transmission losses are provided below:

Table-4:

S. No	Name of Substation	Meter RR. No	Main meter	Check meter
1	EP-II Sub-station at NandanaHosuru	EP2-01	04179674	02048064
		EP2-02	02048052	02048043
2	GIM-II Sub-station at Gownalli	ELP-17	05271046	05389972
		ELP-41	05389983	05389985
3	Gadag Sub-station at Hirevaddatti	HBL/TL&SS/WF/S PML/5)	04249351	04249324
4	VVS Sub-station at G N Kere	VVS-01	04179554	04179661
		VVS-02	04179543	04179553

Quality Control and Quality Assurance:

The readings of main meter and check meter have been checked monthly to assess the accuracy of meters. The difference between readings of main meter and check meter have been checked so that percentage difference in these two readings does not exceed the combined accuracy range of meters.

The main meter and check meter both have accuracy class of 0.2s.

Thus, for any given reading, the difference between the main and check meter cannot exceed 0.4%. Therefore, if the main and check meter readings recorded for any month differs by up to 0.4%, then it is considered to be within the accuracy level; if the difference exceeds 0.4% then a suitable correction factor which is equal to the difference between the calculated accuracy level and the stated accuracy level is applied on the more conservative reading. For the months, when the difference between readings of main and check meter has exceeded the combined accuracy limit, a correction factor equal to the % difference in excess of 0.2s has been applied. In order to ensure conservativeness, correction factor has been applied to the lower value between main and check meter values. This final reading after applying the correction factor on the lower value has been used for CER calculation, which is most conservative.

The details of calibration of meters installed at the site for measuring export and import by project activity are provided below:

Table-5:

S. No.	Name of Customer	R.R.NO.	Main Meter No.	Check Meter No.	Date of Calibration under Monitoring period
1	Neharaj Energy	ELP-2	05342751	05342752	19.01.2012
2	Vivek Trading Company	ELP-11	05342857	05342858	20.01.2012
3	Jubilee Textiles	ELP-3	05342756	05342758	19.01.2012
4	Prasad Technology Park	ELP-18	05271047	05271049	20.01.2012
5	SrinivasaCystine Ltd	ELP-5	05341445	05341446	20.01.2012
6	Avanti Feeds Ltd	ELP-4	05341447	05341448	19.01.2012
7	Siddaganga Oil Extractions Ltd.	ELP-32	05436133	05436139	20.02.2012
8	Unnathi Projects Ltd	VVS 36	05271060	05271059	17.12.2011
9	Unnathi Projects Ltd	VVS 30	05271065	05271066	17.12.2011
10	B.V.Finance and Leasing	ELP-6	05341441	05341450	20.02.2012



11	Shilpa Medicare Ltd	VVS 41	05271043	05293305	17.12.2011
12	Cooper Foundry	VVS 26	04219540	04219539	19.12.2011
13	I. G. E. (India)	VVS 40	05271055	05271056	17.12.2011
14	International Conveyors Ltd	VVS 38	05271044	05271048	17.12.2011
15	Jitendra D. Majetha	VVS 31	05271053	05271054	17.12.2011
16	Patel Shanti Steels P. Ltd.	VVS 21	04187660	04187668	19.12.2011
17	Patel Shanti Steels P. Ltd.	VVS 32	05271050	05271051	19.12.2011
18	Swaraj PVC Pipes P. Ltd.	VVS 39	05271045	07022947	17.12.2011
19	Amrit Bottlers	ELP 13	05342863	05342864	20.01.2012
20	Amrit Bottlers	VVS 42	05293302	05293303	17.12.2011
21	Brindavan Agro	VVS 33	05271052	05271061	17.12.2011
22	Brindavan Agro	ELP-7	05342859	05342860	20.01.2012
23	Rohit Surfactants Pvt Ltd	VVS 27	04219529	04219545	19.12.2011
24	Unnathi Projects Ltd	ELP-19	05390227	05390228	20.01.2012
25	Primetex Apparels India	VVS 24	04186267	04219534	09.03.2012
26	MK Agrotech Private Ltd	VVS 43	05293310	05293312	17.12.2011
27	Laxmi Organics	VVS 25	04219547	04219580	19.12.2011
28	S.E.Investment	VVS 35	06607114	06607013	06.03.2012
29	Dinesh Pouches	EP2-26	05463836	05463837	29.09.2011 29.06.2012
30	UshDev International	EP2-24	05463965	05463972	24.09.2011 29.06.2012
31	Mumbai Stock Brokers Pvt. Ltd.	ELP-21	05389968	05389969	18.02.2012
32	D. R. Container Terminal	ELP-22	05389976	05389980	18.02.2012
33	Indian Power Corporation Ltd	ELP-15	05342757	05342759	20.01.2012
34	Indian Power Corporation Ltd	ELP-16	05436134	05436138	18.02.2012
35	Indian Power Corporation Ltd	ELP-26	05436125	05436128	21.02.2012
36	Enercon Wind Farms (Karnataka) Ltd	HBL/TL&SS/ WF/EWKLH/0 7	06607750	05271064	26.11.2011
37	Enercon Wind Farms (Krishna) Ltd	HBL/TL&SS/ WF/EWKLH/6	04259886	04259887	26.11.2011



Test result of meters calibration is shown below:

Table-6:

S. No.	Name of Customer	Main Meter No.	Check Meter No.	Dates of Calibration		Result Calibration I	Result Calibration II	Calibration frequency	Details of corrections applied
1	Neharaj Energy	5342751	5342752	19.01.2012	NA	Main: 0.061% / Check: 0.047%	NA	OK	Not applicable
2	Vivek Trading Company	5342857	5342858	20.01.2012	NA	Main: 0.12% / Check: 0.16%	NA	OK	Not applicable
3	Jubilee Textiles	5342756	5342758	19.01.2012	NA	Main: 0.11% / Check: 0.01%	NA	OK	Not applicable
4	Prasad Technology Park	5271047	5271049	20.01.2012	NA	Main: 0.121% / Check: 0.071%	NA	OK	Not applicable
5	Srinivasa Cystine Ltd	5341445	5341446	20.01.2012	NA	Main: 0.063% / Check: 0.091%	NA	OK	Not applicable
6	Avanti Feeds Ltd	5341447	5341448	19.01.2012	NA	Main: 0.044% / Check: 0.132%	NA	OK	Not applicable
7	Siddaganga Oil Extractions Ltd.	5436133	5436139	20.02.2012	NA	Main: 0.1% / Check: 0.02%	NA	OK	Not applicable
8	Unnathi Projects Ltd	5271060	5271059	17.12.2011	NA	Main: 0.145% / Check: 0.136%	NA	OK	Not applicable
9	Unnathi Projects Ltd	5271065	5271066	17.12.2011	NA	Main: 0.12% / Check: 0.013%	NA	OK	Not applicable
10	B.V.Finance and Leasing	5341441	5341450	20.02.2012	NA	Main: 0.073% / Check: 0.032%	NA	OK	Not applicable



11	Shilpa Medicare Ltd	5271043	5293305	17.12.2011	NA	Main:0.086% Check: 0.089%	/	NA	OK	Not applicable
12	Cooper Foundry	4219540	4219539	19.12.2011	NA	Main:0.078% Check: 0.085%	/	NA	OK	Not applicable
13	I. G. E. (India)	5293313	5271056	17.12.2011	NA	Main:0.066% Check: 0.078%	/	NA	OK	Not applicable
14	International Conveyors Ltd	5271044	5271048	17.12.2011	NA	Main:0.111% Check: 0.112%	/	NA	OK	Not applicable
15	Jitendra D. Majetha	5271053	5271054	17.12.2011	NA	Main:0.125% Check: 0.014%	/	NA	OK	Not applicable
16	Patel Shanti Steels P. Ltd.	4187660	4187668	19.12.2011	NA	Main:0.068% Check: 0.078%	/	NA	OK	Not applicable
17	Patel Shanti Steels P. Ltd.	5271050	5271051	19.12.2011	NA	Main:0.067% Check: 0.089%	/	NA	OK	Not applicable
18	Swaraj PVC Pipes P. Ltd.	5271045	7022947	17.12.2011	NA	Main:0.056% Check: 0.068%	/	NA	OK	Not applicable
19	Amrit Bottlers	5342863	5342864	20.01.2012	NA	Main: 0.143% Check: 0.074%	/	NA	OK	Not applicable
20	Amrit Bottlers	5293302	5293303	17.12.2011	NA	Main:0.095% Check: 0.075%	/	NA	OK	Not applicable
21	Brindavan Agro	5271052	5271061	17.12.2011	NA	Main:0.03% Check: 0.04%	/	NA	OK	Not applicable
22	Brindavan Agro	5342859	5342860	20.01.2012	NA	Main: 0.053% Check: 0.108%	/	NA	OK	Not applicable
23	Rohit Surfactants Pvt Ltd	4219529	4219545	19.12.2011	NA	Main:0.085% Check: 0.095%	/	NA	OK	Not applicable



24	Unnathi Projects Ltd	5390227	5390228	20.01.2012	NA	Main: 0.052% / Check: 0.061%	NA	OK	Not applicable
25	Primetex Apparels India	4186267	4219534	09.03.2012	NA	Main:0.045% / Check: 0.066%	NA	OK	Not applicable
26	MK Agrotech Private Ltd	5389978	5293312	17.12.2011	NA	Main:0.115% / Check: 0.125%	NA	OK	Not applicable
27	Laxmi Organics	4219547	4219580	19.12.2011	NA	Main:0.184% / Check: 0.125%	NA	OK	Not applicable
28	S.E.Investment	6760776	5271068	06.03.2012	NA	Main:0.038% / Check: 0.042%	NA	OK	Not applicable
29	Dinesh Pouches	5463836	5463837	29.09.2011	29.06.2012	Main:0.155% / Check: 0.164%	Main:0.058% / Check: 0.047%	OK	Not applicable
30	Ush Dev International	5463965	5463972	24.09.2011	29.06.2012	Main:0.165% / Check: 0.144%	Main:0.035% / Check: 0.08%	OK	Not applicable
31	Mumbai Stock Brokers Pvt. Ltd.	5389968	5389969	18.02.2012	NA	Main: 0.13% / Check: 0.16%	NA	OK	Not applicable
32	D. R. Container Terminal	5389976	5389980	18.02.2012	NA	Main: 0.15% / Check: 0.10%	NA	OK	Not applicable
33	Indian Power Corporation Ltd	5342757	5342759	20.01.2012	NA	Main: 0.074% / Check: 0.037%	NA	OK	Not applicable
34	Indian Power Corporation Ltd	5436134	5436138	18.02.2012	NA	Main: 0.18% / Check: 0.14%	NA	OK	Not applicable
35	Indian Power Corporation Ltd	5436125	5436128	21.02.2012	NA	Main: 0.10% / Check: 0.12%	NA	OK	Not applicable
36	Enercon Wind Farms (Karnataka) Ltd	6607750	5271064	26.11.2011	NA	Main: (-)0.03% / Check: 0.009%	NA	OK	Not applicable



37	Enercon Wind Farms (Krishna) Ltd	4259886	4259887	26.11.2011	NA	Main: 0.198% / Check: 0.12%	NA	OK	Not applicable
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The details of calibration for the meters at receiving stations are provided below:

Table-7:

S. No	Name of Substation	Main meter	Check meter	Calibration Test	
				2011	2012
1	EP-II Sub-station at NandanaHosuru	04179674	02048064	24.03.2011	06.03.2012
		02048052	02048043		
2	GIM-II Sub-station at Gownalli	05271046	05389972	13.09.2011	13.06.2012
		05389983	05389985		
3	Gadag Sub-station at Hirevaddatti	04249351	04249324	12.07.2011	25.09.2012
4	VVS Sub-station at G N Kere	04179554	04179661	23.09.2011	27.07.2012
		04179543	04179553		



Test results of meters calibration at substations are detailed below:

Table-8:

S. No.	Name of Customer	Main Meter No.	Check Meter No.	Dates of Calibration		Result I Calibration	Result II Calibration	Calibration frequency	Details of corrections applied
1	EP-II Sub-station at NandanaHosuru	4179674	2048064	24.03.2011	06.03.2012	Main:0.105 % / Check: (-)0.111%	Main:0.2 % / Check: 0.19%	OK	Not Applicable
		2048052	2048043			Main:(-)0.104%/ Check: (-)0.137%	Main: 0.16% / Check: 0.14%	OK	Not Applicable
2	GIM-II Sub-station at Gownalli	5271046	5389972	13.09.2011	13.06.2012	Main: (-)0.073% / Check:(-) 0.061%	Main: (-)0.025% / Check:(-) 0.03%	OK	Not Applicable
		5389983	5389985			Main: (-)0.073% / Check:(-) 0.061%	Main: (-)0.084% / Check:(-) 0.02%	OK	Not Applicable
3	Gadag Sub-station at Hirevaddatti	4249351	4249324	12.07.2011	25.09.2012	Main:0.118% / Check: 0.097%	Main:0.198% / Check: 0.199%	NOT OK	Correction factor has been applied for the months of July, Aug & Sep-2012
4	VVS Sub-station at G N Kere	4179554	4179661	23.09.2011	27.07.2012	Main: 0.168% / Check: 0.027%	Main: 0.306% / Check: 0.03%	OK	Not Applicable
		4179543	4179553			Main: (-)0.046% / Check:(-) 0.094%	Main: (-)0.01% / Check:(-) 0.116%	OK	Not Applicable

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante or at renewal of crediting period

(Copy this table for each piece of data and parameter.)

Data/Parameter	$EF_{OM,y}$								
Unit	tCO ₂ e/MWh								
Description	Operating Margin Emission Factor of Southern Regional Electricity Grid								
Source of data	“CO ₂ Baseline Database for Indian Power Sector” published by the Central Electricity Authority, Ministry of Power, Government of India. The “CO ₂ Baseline Database for Indian Power Sector” is available at www.cea.nic.in								
Value(s) applied	<table border="1"> <tr> <td>2002 – 03</td><td>0.99702</td></tr> <tr> <td>2003 – 04</td><td>1.00937</td></tr> <tr> <td>2004 – 05</td><td>1.00376</td></tr> <tr> <td>Average</td><td>1.00338</td></tr> </table>	2002 – 03	0.99702	2003 – 04	1.00937	2004 – 05	1.00376	Average	1.00338
2002 – 03	0.99702								
2003 – 04	1.00937								
2004 – 05	1.00376								
Average	1.00338								
Purpose of data	To calculate Baseline Emissions Factor								
Additional comment	None								

Data/Parameter	$EF_{BM,y}$
Unit	tCO ₂ e/MWh
Description	Build Margin Emission Factor of Southern Regional Electricity Grid
Source of data	“CO ₂ Baseline Database for Indian Power Sector” published by the Central Electricity Authority, Ministry of Power, Government of India. The “CO ₂ Baseline Database for Indian Power Sector” is available at www.cea.nic.in
Value(s) applied	0.71799
Purpose of data	To calculate Baseline Emissions Factor
Additional comment	None

Data/Parameter	$EF_{CM,y}$
Unit	tCO ₂ e/MWh
Description	Combined Margin Emission Factor of Southern Regional Electricity Grid
Source of data	Calculated
Value(s) applied	0.93204
Purpose of data	To calculate Baseline Emissions
Additional comment	None

D.2. Data and parameters monitored

(Copy this table for each piece of data and parameter.)

Data / Parameter	EGy
Unit	MWh (Mega-watt hour)
Description	Net electricity supplied to the grid by the Project
Measured/Calculated /Default	Calculated
Source of data	Electricity supplied to the grid as per Joint Meter Readings (Form B) taken at 33kV metering point for each of the sub project included in the project activity.
Value(s) of monitored parameter	107906.387
Monitoring equipment	<p>Metering system for the project activity consists of dedicated main and check meters for each of the sub project owner included in the project activity at 33 kV metering location. Additionally, another set of main and check meters (bulk meters) are installed at the substation to which the project activity's sub-projects are connected with projects of other project developers.</p> <p>The subprojects included in the project activity are connected to respective Enercon substations as shown in Appendix-1.</p> <p>The bulk meters installed at the substation are also connected to other sub project activities of the same project and to other project activities. Based on individual readings of each meter at the sub project activity site and of respective bulk meters at the substation, a factor known as Transmission Loss% is calculated and recorded by the by the statutory authority. The transmission loss% calculated by the state utility is endorsed / confirmed jointly by the representatives of Enercon (India) Ltd.(EIL). Each meter is also assigned a Multiplication Factor (MF) based on the CT ratio of the installation; this (MF) is displayed at the metering station and is also recorded in the JMR. The meter readings are multiplied with the MF to which the transmission loss is applied to arrive at the net export of power from the sub project activity. The import readings recorded at the sub project activity site are adjusted for a default factor of 15%. The difference of net export and 115% of import reading is recorded as net electricity supplied to the grid by the sub project activity and is shown as the net energy to be billed in the JMR. The aggregate sum of all such individual net electricity supplied by the bundle components is reckoned as the net electricity supplied to the grid by the project for calculation of Certified Emission Reductions.</p> <p>The Joint Meter Readings (JMR) issued in FORM B by the statutory authority contains recorded details of opening and closing meter readings of export and import as per the main and check meters of each sub project activity, the transmission losses apportioned and the net electricity supplied by the sub project activity. The JMR is recorded by the authorised representative of the power purchasing company in the presence of the authorised representative of the project and is duly signed by both in acceptance of the correctness of the entries.</p> <p>Refer section C for an illustration of the provisions for measurement</p>



	methods.
Measuring/Reading/Recording frequency	Frequency of recording data: Monthly Recording: The values of electricity supplied to the grid are sourced from JMR for the sub projects at 33 kV metering point.
Calculation method (if applicable)	$EG_y = EG_{\text{export}} - 115\% * EG_{\text{import}} - \text{Transmission Loss (TE)}$
QA/QC procedures	Refer section C for an illustration of the provisions for QA/QC procedures.
Purpose of data	To calculate emission reduction.
Additional comment	The data will be archived for crediting period + 2 years.

Data/Parameter	EG_{export}
Unit	MWh (Mega-Watt hour)
Description	Electricity Export recorded at the designated meter. All the subprojects included in the project activity have dedicated main and check meters at 33 kV metering point.
Measured/Calculated/Default	Measured
Source of data	Electricity export to the grid as per joint meter reading (FormB) for each of the sub project taken at 33kV metering point. The main meter reading is considered for all calculations. The purpose of the check meter is to serve as a check on the accuracy of measurement and its reading is used when main meter is not working properly.
Value(s) of monitored parameter	109726.005
Monitoring equipment	Monitoring: Electricity export to the grid will be recorded by the meters (main and check meters) at 33kV point. Refer section C for an illustration of the provisions for measurement methods.
Measuring/Reading/Recording frequency	Frequency of recording data: Monthly Recording: The values of electricity exports to the grid are sourced from JMR for the sub projects at 33 kV metering point.
Calculation method (if applicable)	NA
QA/QC procedures	QA/QC procedures are implemented by state utility pursuant to the provisions of the power purchase agreement. Refer section C of QA/QC procedures.
Purpose of data	To calculate emission reduction.
Additional comment	The data will be archived for crediting period + 2 years.



Data/Parameter	EGimport
Unit	MWh (Mega-Watt hour)
Description	Electricity Import recorded at the meters (main and check meters). All the subprojects included in the project activity have dedicated main and check meters at 33 kV metering point.
Measured/Calculated /Default	Measured
Source of data	Electricity import from the grid as per joint meter reading for each of the sub project taken at 33kV metering point.
Value(s) of monitored parameter	119.7
Monitoring equipment	Monitoring: Electricity export to the grid will be recorded by the meters (main and check meters) at 33kV point. Refer section C for an illustration of the provisions for measurement methods.
Measuring/Reading/ Recording frequency	Frequency of recording data: Monthly Recording: The values of electricity exports to the grid are sourced from JMR for the sub projects at 33 kV metering point.
Calculation method (if applicable)	NA
QA/QC procedures	QA/QC procedures are implemented by state utility pursuant to the provisions of the power purchase agreement. Refer section C of QA/QC procedures.
Purpose of data	To calculate emission reduction.
Additional comment	The data will be archived for crediting period + 2 years.



Data/Parameter	T_E
Unit	MWh (Mega-Watt hour)
Description	Transmission loss for export between the metering location at 33 kV metering point and the high voltage side of the substation to which the subproject is connected.
Measured/Calculated /Default	Measured
Source of data	Transmission Loss for export will be sourced from the joint meter reading (Form B) taken at 33kV metering point for all the sub projects included in the project activity.
Value(s) of monitored parameter	1582.699
Monitoring equipment	<p>Monitoring: Transmission loss between metering location at 33 kV and the metering location at receiving substation is applied to the meter reading taken at meters connected at 33 KV point for the project activity.</p> <p>The Substation is connected to the machines of the project activity and the machines commissioned by the other project owners. Therefore transmission loss is applied by the state utility as reflected in the JMR (Form B) taken at 33kV point for all the sub projects included in the project activity. The JMR is signed by the representatives of Enercon and the state utility. Refer section C for an illustration of the provisions for measurement methods.</p>
Measuring/Reading/ Recording frequency	<p>Frequency of recording data: Monthly</p> <p>Recording: The value of transmission loss is sourced from JMR for all sub projects at 33 kV metering point.</p>
Calculation method (if applicable)	NA
QA/QC procedures	QA/QC procedures are implemented by state utility pursuant to the provisions of the power purchase agreement. Refer section C of QA/QC procedures.
Purpose of data	To calculate emission reduction.
Additional comment	The data will be archived for crediting period + 2 years.

D.3. Implementation of sampling plan

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No sampling plan is followed by PP.

SECTION E. Calculation of emission reductions or GHG removals by sinks

E.1. Calculation of baseline emissions or baseline net GHG removals by sinks

>>

“The baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kg CO₂e/kWh) calculated in a transparent and conservative manner as the weighted average emissions (in kg CO₂e/kWh) as described in registered PDD.

$$BE_y = EG_y * EF_y$$

Where,

BE is baseline emissions in year y, tCO₂e

EG_y is the net electricity supplied to the grid in year y and is applied directly from JMR certified by state utility. This value can also be cross checked from the invoice.

EF_y is the CO₂ emission factor of the grid (0.93204 tCO₂e/MWh fixed ex-ante).

Baseline Emission for the period (01/08/2011 to 31/05/2012)

= 107906387 (Kwh) * 0.93204 (tCO₂/MWh) /10³

= **100501 tCO₂**

*(Please note that baseline emission calculation of EG_y * EF_y as mentioned above gives a result of 100573 numbers (approx.), but actual baseline emission reduction achieved has been considered as 100501 numbers as this was a conservative number arrived after round down the baseline emission calculation for individual customer against the application of above calculation on lump sum of net electricity supplied to the grid by complete project activity)*

Table-10:

Name of Customer	Site	EG _y	Baseline Emissions (BE _y)
		(KWh)	(tCO ₂)
Neharaj Energy	GIM-II	875792	815
Vivek Trading Company	GIM-II	817208	760
Jubilee Textiles	GIM-II	888122	826
Prasad Technology Park	GIM-II	1935412	1802
Srinivasa Cystine Ltd	GIM-II	1859260	1731
Avanti Feeds Ltd	GIM-II	3979345	3707
Siddaganga Oil Extractions Ltd.	GIM-II	1982178	1846
Unnathi Projects Ltd	GIM-II	854258	795
B.V.Finance and Leasing	GIM-II	1996149	1859
Shilpa Medicare Ltd	Vanivilas Sagar	1661611	1547
Cooper Foundry	Vanivilas Sagar	4106698	3827
I. G. E. (India)	Vanivilas Sagar	821942	764
International Conveyors Ltd	Vanivilas Sagar	809332	752
Jitendra D. Majetha	Vanivilas Sagar	786470	731
Patel Shanti Steels P. Ltd.	Vanivilas Sagar	1755529	1631
Swaraj PVC Pipes P. Ltd.	Vanivilas Sagar	842131	784
Amrit Bottlers	GIM-II	963789	895
Amrit Bottlers	Vanivilas Sagar	1602754	1491
Brindavan Agro	GIM-II	3055458	2846



Brindavan Agro	vanivilas Sagar	1768814	1648
Rohit Surfactants Pvt Ltd	Vanivilas Sagar	9653932	8996
Unnathi Projects Ltd	Vanivilas Sagar	3321290	3093
Primetex Apparels India	Vanivilas Sagar	858902	799
MK Agrotech Private Ltd	Vanivilas Sagar	1645788	1531
Laxmi Organics	Vanivilas Sagar	2075242	1932
S.E.Investment	Vanivilas Sagar	3762081	3504
Dinesh Pouches	EP-II	1017801	947
Ush Dev International	EP-II	2083239	1939
Mumbai Stock Brokers Pvt. Ltd.	Gim-II	916729	852
D. R. Container Terminal	Gim-II	1558362	1450
Indian Power Corporation Ltd	GIM-II	11294707	10521
Enercon Wind Farms (Karnataka) Ltd	Gadag	10100090	9411
Enercon Wind Farms (Krishna) Ltd	Gadag	26255975	24469
Total		107906387	100501

E.2. Calculation of project emissions or actual net GHG removals by sinks

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The project activity is a renewable energy project which generates electricity using wind power and hence does not result in project emissions.

E.3. Calculation of leakage

>>

No leakage is considered from the project activity as per approved methodology ACM0002, Version 06.

E.4. Summary of calculation of emission reductions or net anthropogenic GHG removals by sinks

Time Period	Baseline emissions or baseline net GHG removals by sinks (tCO _{2e})	Project emissions or actual net GHG removals by sinks (tCO _{2e})	Leakage (tCO _{2e})	Emission reductions or net anthropogenic GHG removals by sinks (tCO _{2e})
01/06/2012 – 30/09/2012	100501	0	0	100501
Total	100501	0	0	100501

**E.5. Comparison of actual emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD**

Item	Values estimated in ex-ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (tCO ₂ e)	53227	100501

E.6. Remarks on difference from estimated value in registered PDD

>>

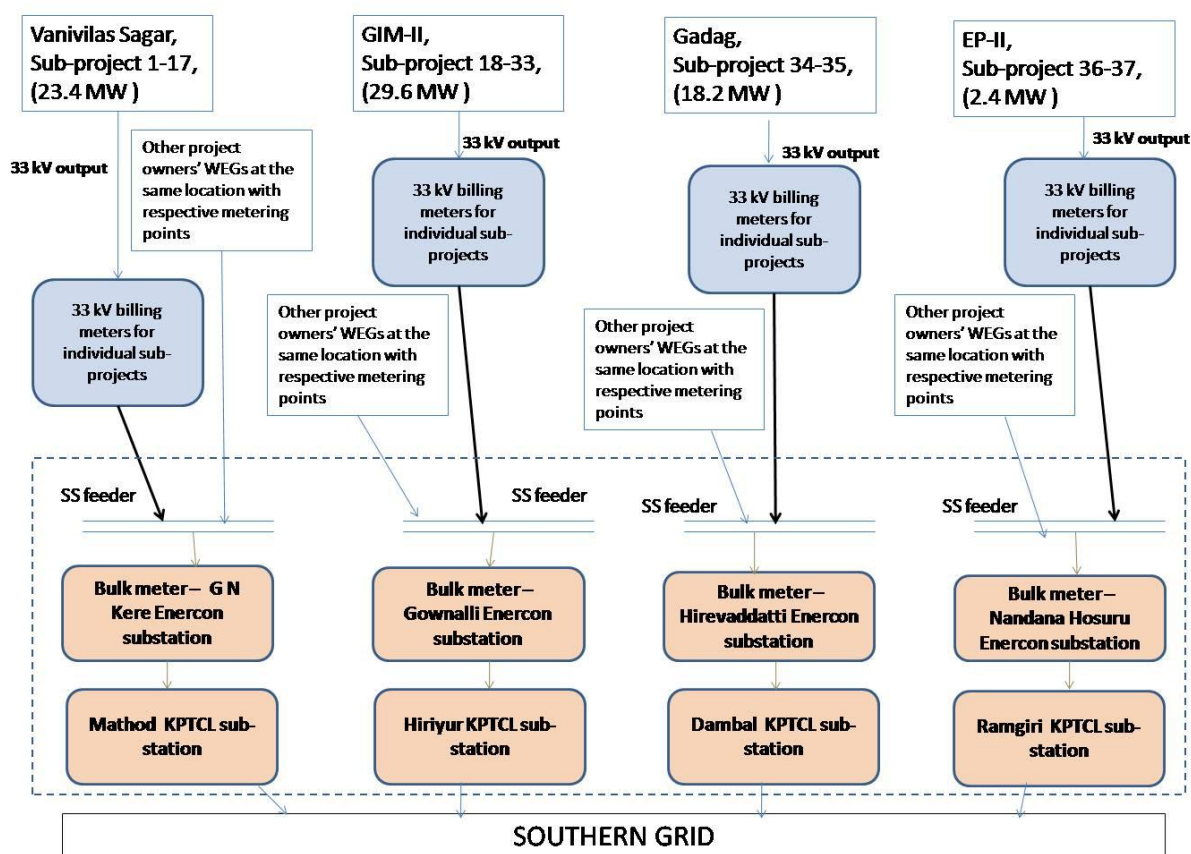
The Emission Reduction (ER) value in the monitoring period is 88.8% higher as compared to the value estimated in the registered PDD, which is due to exclusive consideration of peak wind season in the monitoring period. However, the consolidated PLF observed for the project activity from the beginning of crediting period till the end of present monitoring period is 0.34% less than the corresponding value mentioned in the registered PDD.

History of the document

Version	Date	Nature of revision
02.0	EB 66 13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	EB 54, Annex 34 28 May 2010	Initial adoption.
Decision Class: Regulatory Document Type: Form Business Function: Issuance		

Appendix 1

Metering Arrangement for the Project Activity



NOTE: There are 37 installations of 33 kVA billing meters and 4 substation (ss) metering points, details of which are as provided below:

Table-11:

S. No	Name of Customers	Capacity (MW)	R.R. NO.	Site Name	Name of Enercon Substation	Meter Accuracy Class
1	Primetex Apparels India	0.6	VVS-24	VanivilasSagar	VVS Sub-station at G N Kere	0.2S
2	Patel Shanti Steels P. Ltd.	0.6	VVS-21,	VanivilasSagar		0.2S
3	Patel Shanti Steels P. Ltd.	0.6	VVS-32	VanivilasSagar		0.2S
4	Laxmi Organics	1.2	VVS 25	VanivilasSagar		0.2S
5	Rohit Surfactants P.Ltd	6	VVS 27	VanivilasSagar		0.2S



6	Cooper foundry	2.4	VVS-26	VanivilasSagar		0.2S
7	I. G. E. (India)	0.6	VVS-40	VanivilasSagar		0.2S
8	International Conveyors Ltd	0.6	VVS-38	VanivilasSagar		0.2S
9	Jitendra D. Majetha	0.6	VVS-31	VanivilasSagar		0.2S
10	Swaraj PVC Pipes P. Ltd.	0.6	VVS-39	VanivilasSagar		0.2S
11	Shilpa Medicare Ltd.	1.2	VVS-41	VanivilasSagar		0.2S
12	Amrit Bottlers	1.2	VVS-42	VanivilasSagar		0.2S
13	Brindavan Agro	1.2	VVS-33	VanivilasSagar		0.2S
14	MK Agrotech Private Ltd	1.2	VVS-43	VanivilasSagar		0.2S
15	Unnathi Projects Ltd	0.6	VVS-30	VanivilasSagar		0.2S
16	Unnathi Projects Ltd	1.8	VVS-36	VanivilasSagar		0.2S
17	S.E.Investment	2.4	VVS-35	VanivilasSagar		0.2S
18	Jubilee Textiles	0.8	ELP-3	GIM-II	GIM-II substation at Gownalli	0.2S
19	Amrit Bottlers	0.8	ELP-13	GIM-II		0.2S
20	SrinivasaCystine Ltd	1.6	ELP-5	GIM-II		0.2S
21	B.V.Finance and leasing	1.6	ELP-6	GIM-II		0.2S
22	Brindavan Agro	3.2	ELP-7	GIM-II		0.2S
23	Avanti Feeds Ltd	3.2	ELP-4	GIM-II		0.2S
24	Indian power corporation	2.4	ELP-15	GIM-II		0.2S
25	Indian power corporation	4.8	ELP-16	GIM-II		0.2S
26	Indian power corporation	3.2	ELP-26	GIM-II		0.2S
27	Neharaj Energy	0.8	ELP-2	GIM-II		0.2S
28	Vivek Trading Co.	0.8	ELP-11	GIM-II		0.2S
29	Unnathi Project Ltd	0.8	ELP-19	GIM-II		0.2S
30	Mumbai Stock	0.8	ELP-21	GIM-II		0.2S



	Brokers Pvt. Ltd.					
31	Siddaganga Oil Extractions Ltd.	1.6	ELP-32	GIM-II		0.2S
32	Prasad Technology Park	1.6	ELP-18	GIM-II		0.2S
33	D. R. Container Terminal	1.6	ELP-22	GIM-II		0.2S
34	Enercon Wind Farms (Krishna) Ltd	15	HBL/TL&SS / WF/EWKLH /6	Gadag	Gadag substation at Hiredawatti	0.2S
35	Enercon Wind Farms (Karnataka) Ltd	3.2	HBL/TL&SS / WF/EWKLH /07	Gadag		0.2S
36	Dinesh Pouches	0.8	EP2-26	EP-II	EP-II substation at NandanaHosuru	0.2S
37	UshDev International	1.6	EP2-24	EP-II		0.2S
	Total Capacity (MW)	73.60				

The details of meters installed at receiving station for the purpose of measuring and allotting transmission losses are provided below:

Table-12:

S. No	Name of Substation	RR. No	Meter accuracy class
1	EP-II Sub-station at NandanaHosuru	EP2-01	0.2S
		EP2-02	0.2S
2	GIM-II Sub-station at Gownalli	ELP-17	0.2S
		ELP-41	0.2S
3	Gadag Sub-station at Hiredawatti	HBL/TL/&SS/WF/SP ML/5	0.2S
4	VVS Sub-station at G N Kere	VVS-01	0.2S
		VVS-02	0.2S