

**MONITORING REPORT FORM (CDM-MR)**
Version 01**CONTENTS**

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MONITORING REPORT
Version 1.0 and Date 07/10/2010

Title: “ENERCON WIND FARMS IN KARNATAKA BUNDLED PROJECT – 30.40 MW”
Project Reference No: 1291
Monitoring Period - FROM 18/03/2010 TO 31/08/2010 (including first and last day)

SECTION A. General description of the project activity

A.1. Brief description of the project activity: >>

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Objective of the Project

The objective is development, design, engineering, procurement, finance, construction, operation and maintenance of Enercon Wind Farm (Chitradurga) Ltd of 8.8 MW and other wind power projects of 21.60 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.

The Project harnesses renewable resources in the region, and thereby displacing non-renewable natural resources thereby ultimately leading to sustainable economic and environmental development. Enercon (India) Ltd (“Enercon”) will be the equipment supplier and the operations and maintenance contractor for the Project. The generated electricity will be supplied to Karnataka Power Transmission Company Ltd (“KPTCL”)/ Bangalore Electricity Supply Company Ltd (“BESCOM”) / Hubli Electricity Supply Company Ltd (“HESCOM”) under long-term power purchase agreements (PPA). Enercon Wind Farm (Chitradurga) Ltd is owned by Enercon (India) Ltd and Enercon GmbH and the rest of the projects are owned by Enercon’s customers. The details of the Projects are as under:

1. Enercon Wind Farms (Chitradurga) Ltd:	8.80 MW
2. Steelfab Offshore	0.80 MW
3. Dewanchand Ramsaran:	0.80 MW
4. Elpro International:	0.80 MW
5. Gautam Ladkat:	0.80 MW
6. Sameer Ladkat:	0.80 MW
7. Panama Business Centre:	1.60 MW
8. Balasahab Ladkat:	1.60 MW
9. Panama Infrastructure:	1.60 MW
10. MK Agrotech Private Ltd:	1.60 MW
11. Srinivas Sirigeri:	0.80 MW
12. Power Link System Private Limited ¹	0.80 MW
13. Dempo Industries:	0.80 MW
14. Desai Brothers:	0.80 MW
15. Abhilash Garments & Estates (P) Ltd:	0.80 MW
16. Prasad Global Solutions:	1.60 MW
17. Siddaganga Oil Extractions Ltd.:	1.60 MW
18. Gangadhar Narsingdas Agarwal:	4.00 MW

The first machine under the project activity was commissioned on 29/03/2006 and the last machine under the project activity was commissioned on 29/12/2006. The expected operational lifetime of the project is for 20

¹ Ownership of one machine has been transferred from “RK Marbles” (as mentioned in the registered PDD) to “Power Link System Private Limited”. The proof of the same will be provided to the DOE.



years. The total emission reductions achieved under this monitoring period (18/03/2010 to 31/08/2010) is **28,110 tCO₂**.

A.2. Project Participants

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Enercon (India) Limited ("Enercon")

Japan Carbon Finance

A.3. Location of the project activity:

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The Project is located in the State of Karnataka that forms part of the Southern regional electricity grid of India. Approximate distance of the project activity from Bangalore by road is 200 km. The nearest major railway station as well as airport is Bangalore. Geo-coordinates of individual machines in the project activity are given below:

S.No	Project Owner	Unique Identification No.	Loc No	Latitude			Longitude		
				Deg.	Min.	Sec.	Deg.	Min.	Sec.
1	Enercon Wind Farms (Chitradurga) Ltd	EWCLA-01	1	14	2	45.2	76	28	8.3
2		EWCLA-02	2	14	2	49.0	76	28	6.3
3		EWCLA-03	3	14	2	52.6	76	28	5.0
4		EWCLA-04	4	14	2	56.7	76	28	4.4
5		EWCLA-05	5	14	3	0.6	76	28	3.8
6		EWCLA-06	6	14	3	4.4	76	28	3.0
7		EWCLA-07	7	14	3	8.8	76	28	2.4
8		EWCLA-08	8	14	3	14.6	76	28	1.2
9		EWCLA-09	9	14	3	18.4	76	28	0.3
10		EWCLA-10	10	14	3	22.1	76	27	59.2
11		EWCLA-11	11	14	3	26.0	76	27	58.6
12	Steelfab Offshore	SFOGH2-01	71	13	57	3.6	76	25	4.9
13	Dewanchand Ramsaran	DRGH2-01	72	13	57	0	76	25	6.7
14	Elpro International	EILGH2-01	59	13	58	50.7	76	25	24.9
15	Gautam Ladkat	GLGH2-01	69	13	57	10.8	76	25	0.9
16	Sameer Ladkat	SLGH2-01	45	13	59	22.4	76	23	52.6
17	Panama Business Centre	PBCGH2-01	65	13	57	23.5	76	24	55
18		PBCGH2-02	66	13	57	20	76	24	54.6
19	Balasahab Ladkat	BMLGH2-01	67	13	57	16.3	76	24	55.9
20		BMLGH2-02	68	13	57	12.9	76	24	57.5
21	Panama Infrastructure:	PBC-01	EP-54	13	58	30.7	76	19	17.1
22	MK Agrotech Private Ltd	MKAGH2-01	61	13	58	44.3	76	25	26.3
23		MKAGH2-02	62	13	58	40.9	76	25	28
24	Srinivas	SSHD-01	7	13	58	35.6	76	28	23.3



	Sirigeri								
25	Power Link System Private Limited	PLSHD-01	5	13	58	26	76	28	23.2
26	Dempo Industries	DIPLHD-01	6	13	58	29.3	76	28	21.2
27	Desai Brothers	DBLHD-01	1	13	58	11.2	76	28	32.6
28	Abhilash Garments & Estates (P) Ltd	AGEGA-01	11	15	8	57.3	75	38	38.2
29	Prasad Global Solutions:	PGSGA-01	1	15	10	7.9	75	38	34.5
30		PGSGA-02	17	15	8	19.4	75	39	1.8
31	Siddaganga Oil Extractions Ltd	SOEGA-01	14	15	8	40.3	75	38	44.3
32		SOEGA-02	15	15	8	36.5	75	38	46.8
33	Gangadhar Narsingdas Agarwal	GNAGA-01	6	15	9	34.3	75	38	27.1
34		GNAGA-02	7	15	9	26.4	75	38	31.5
35		GNAGA-03	8	15	9	20.5	75	38	32.0
36		GNAGA-04	12	15	8	48.7	75	38	39.4
37		GNAGA-05	13	15	8	44.7	75	38	41.0

A.4. Technical description of the project

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The Project involves 38 wind energy converters (WECs) of Enercon make 800 kW E-48 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 drawl (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.

Enercon (India) Ltd has secured and facilitated the technology transfer for wind based renewable energy generation from Enercon GmbH, has established a manufacturing plant at Daman in India, where along with other components the "Synchronous Generators" using "Vacuum Impregnation" technology are manufactured.

**A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity:**

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The approved consolidated baseline and monitoring methodology **ACM0002 Version 6.0** (19 May 2006) has been used. The titles of these baseline and monitoring methodologies are “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” and “Consolidated monitoring methodology for grid-connected electricity generation from renewable sources.”

A.6. Registration date of the project activity:

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18/03/2010

A.7. Crediting period of the project activity and related information (start date and choice of crediting period):

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The length of the Crediting period of the project activity as per registered PDD is 10 years (Fixed). The crediting period start date is 18/03/2010 and length of crediting period is 10 years (from 18/03/2010 to 17/03/2020).

A.8. Name of responsible person(s)/entity(ies):

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Organization:	Enercon (India) Limited
Street/P.O.Box:	Enercon Tower, A-9, Veera Industrial Estate, Veera Desai Road,
Building:	
City:	Andheri (W),
State/Region:	Mumbai
Postfix/ZIP:	400053
Country:	India
Telephone:	+91-22-66924848
FAX:	+91-22-66921175
E-Mail:	yogesh.mehra@enerconindia.net
URL:	
Represented by:	
Title:	Managing Director
Salutation:	Mr.
Last Name:	Mehra
Middle Name:	
First Name:	Yogesh
Department:	Corporate
Mobile:	+91-98200 40301
Direct FAX:	+91-22-66921175
Direct tel:	+91-22-66924848 extn. 7111
Personal E-Mail:	yogesh.mehra@enerconindia.net

Organization:	Japan Carbon Finance, Ltd.
Street/P.O.Box:	6 th Floor, 1-3 Kundankita, 4-chrome
Building:	Chiyoda-ku
City:	Tokyo
State/Region:	
Postfix/ZIP:	102-0073
Country:	Japan



Telephone:	+81 3 5212 8870
FAX:	+81 3 5212 8886
E-Mail:	jcf@jcarbon.co.jp
URL:	http://www.japancarbon.co.jp/
Represented by:	
Title:	Director General
Salutation:	Mr.
Last Name:	Ari
Middle Name:	
First Name:	Masato
Department:	Carbon Finance Department

SECTION B. Implementation of the project activity

B.1. Implementation status of the project activity

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The first machine under the project activity was commissioned on 29/03/2006 and last machine under the project activity was commissioned on 29/12/2006. The project activity consists of 38 machines (800 kWh) of Enercon make E-48 totaling to a capacity of 30.4 MW. The commissioning date for all the machines included in the project activity is given in the table below.

S.No	Project Owner	Unique Identification No.	Loc No	Commissioning date
1	Enercon Wind Farms (Chitradurga) Ltd	EWCLA-01	1	06/05/2006
2		EWCLA-02	2	06/05/2006
3		EWCLA-03	3	06/05/2006
4		EWCLA-04	4	06/05/2006
5		EWCLA-05	5	06/05/2006
6		EWCLA-06	6	06/05/2006
7		EWCLA-07	7	31/03/2006
8		EWCLA-08	8	31/03/2006
9		EWCLA-09	9	31/03/2006
10		EWCLA-10	10	31/03/2006
11		EWCLA-11	11	31/03/2006
12	Steelfab Offshore	SFOGH2-01	71	31/03/2006
13	Dewanchand Ramsaran	DRGH2-01	72	31/03/2006
14	Elpro International	EILGH2-01	59	31/03/2006
15	Gautam Ladkat	GLGH2-01	69	31/03/2006
16	Sameer Ladkat	SLGH2-01	45	31/03/2006
17	Panama Business Centre	PBCGH2-01	65	31/03/2006
18		PBCGH2-02	66	31/03/2006
19	Balasahab Ladkat	BMLGH2-01	67	31/03/2006
20		BMLGH2-02	68	31/03/2006
21	Panama Infrastructure:	PBC-01	EP-54	31/03/2006



22	MK Agrotech Private Ltd	MKAGH2-01	61	31/03/2006
23		MKAGH2-02	62	31/03/2006
24	Srinivas Sirigeri	SSHD-01	7	29/03/2006
25	Power Link System Private Limited	PLSHD-01	5	29/03/2006
26	Dempo Industries	DIPLHD-01	6	29/03/2006
27	Desai Brothers	DBLHD-01	1	29/03/2006
28	Abhilash Garments & Estates (P) Ltd	AGEGA-01	11	29/12/2006
29	Prasad Global Solutions:	PGSGA-01	1	29/12/2006
30		PGSGA-02	17	29/12/2006
31	Siddaganga Oil Extractions Ltd	SOEGA-01	14	31/03/2006
32		SOEGA-02	15	31/03/2006
33	Gangadhar Narsingdas Agarwal	GNAGA-01	6	29/12/2006
34		GNAGA-02	7	29/12/2006
35		GNAGA-03	8	29/12/2006
36		GNAGA-04	12	29/12/2006
37		GNAGA-05	13	29/12/2006

Enercon operation and maintenance activities are ISO 9001:2000 certified and all the events are recorded in the log book available at the project site. Referring to the data available it can be inferred that there have not been any major special events for any of the machines that are included in the project activity. As a part of regular maintenance the machines are stopped for mechanical and electrical maintenance for 16 to 18 hours annually and for visual inspection for 6 to 7 hours quarterly.

B.2. Revision of the monitoring plan

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Not Applicable

B.3. Request for deviation applied to this monitoring period

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Not Applicable

B.4. Notification or request of approval of changes

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Not Applicable

SECTION C. Description of the 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

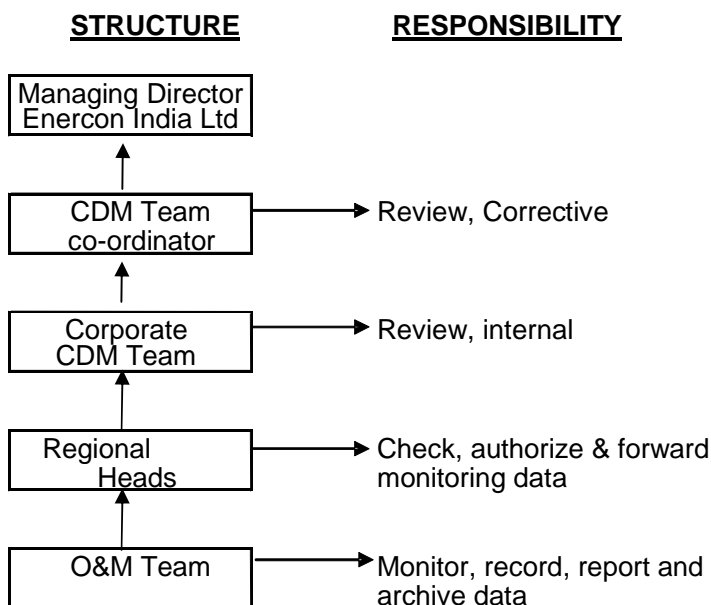


Since the baseline methodology is based on ex ante determination of the baseline, the monitoring of operating margin emission factor and build margin emission factor is not required.

Net Energy Supplied to Grid after adjustment of transmission loss is sourced from JMR (Form B) signed jointly by Enercon and the state utility.

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

The Net electricity supplied to the grid is recorded by taking a Joint Meter Reading (JMR) in the presence of Officials from off-taking Utility and Enercon India Limited. EG_{export} , EG_{import} and TE . The Project is operated and managed by Enercon (India) Ltd. The operational and management structure implemented by Enercon is as follows:



The detailed monitoring plan is described below:

- **Metering:** Electricity supplied to the grid is metered by the Parties (KPTCL, Enercon and the Project) at the high voltage side of the step up transformer installed at the Project Site.
- **Metering Equipment:** Metering system for the project activity consists of one main and one check meter. Both the meters are **two-way trivector meters capable of recording import and export of electricity** and provide output in the form of net electricity supplied to the grid. The main meter is installed and owned by the Project, whereas check meters are owned by KPTCL. The metering equipment is maintained in accordance with electricity standards prevalent in Karnataka. The meters installed are capable of recording and storing half hourly readings of all the electrical parameters for a minimum period of 35 days with digital output.
- **Meter Readings:** The Net electricity supplied to the grid is recorded by taking a Joint Meter Reading (JMR) in the presence of Officials from off-taking Utility and Enercon (India) Limited. The Joint meter reading contains the value of energy imported and exported and the net export to the grid during the recording period. This Joint meter reading is certified by the Executive engineer of the utility and by Enercon Officials. These certified readings are then used by the Discom officials to prepare the tariff invoices. Thus the sole monitoring parameter for the project activity is the net electricity supplied to the



grid as mentioned in the JMR, which will be crosschecked with the value mentioned in the invoices as indicated by the main meter.

- **Inspection of Energy Meters:** All the main and check energy meters (export and import) and all associated instruments, transformers installed at the Project are of 0.2% 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 the 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 0.2 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.

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 staff 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.

Calibration Details

The metering equipments were inspected & calibrated by state utility. Calibration details for the all the main and backup meters are provided below.

Project Owner	Meter Type	Meter Sr. no.	Accuracy class	Make	Calibration prior to monitoring period	Latest Calibration done	Due Calibration on
Enercon Wind Farms (Chitradurga) Ltd	Main Meter	5463842	0.2	L&T	31/03/2006	24/03/2010	24/03/2011
	Check Meter	5463855	0.2	L&T	31/03/2006	24/03/2010	24/03/2011
Steelfab Offshore	Main Meter	5437939	0.2	L&T	1/9/2008	27/02/2010	27/02/2011
	Check Meter	5437956	0.2	L&T	1/9/2008	27/02/2010	27/02/2011
Dewanchand Ramsaran	Main Meter	5389379	0.2	L&T	1/9/2008	27/02/2010	27/02/2011
	Check Meter	5389378	0.2	L&T	1/9/2008	27/02/2010	27/02/2011



Elpro International	Main Meter	5436130	0.2	L&T	21/07/2009	25/09/2010	25/09/2011
	Check Meter	5436135	0.2	L&T	21/07/2009	25/09/2010	25/09/2011
Gautam Ladkat	Main Meter	5389971	0.2	L&T	1/9/2008	27/02/2010	27/02/2011
	Check Meter	5389974	0.2	L&T	1/9/2008	27/02/2010	27/02/2011
Sameer Ladkat	Main Meter	5436122	0.2	L&T	24/07/2009	29/09/2010	29/09/2011
	Check Meter	5436121	0.2	L&T	24/07/2009	29/09/2010	29/09/2011
Panama Business Centre	Main Meter	5390229	0.2	L&T	27/02/2010	30/08/2010	30/08/2011
	Check Meter	5390230	0.2	L&T	27/02/2009	30/08/2010	30/08/2011
Balasahab Ladkat	Main Meter	3074850	0.2	L&T	26/12/2009	19/2/2010	19/2/2011
	Check Meter	3074854	0.2	L&T	26/12/2009	19/2/2010	19/2/2011
Panama Infrastructure	Main Meter	5389981	0.2	L&T	24/07/2009	29/09/2010	29/09/2011
	Check Meter	5389986	0.2	L&T	24/07/2009	29/09/2010	29/09/2011
MK Agrotech Private Ltd	Main Meter	5389904	0.2	L&T	21/07/2009	25/09/2010	25/09/2011
	Check Meter	5386140	0.2	L&T	21/07/2009	25/09/2010	25/09/2011
Srinivas Sirigeri	Main Meter	5463840	0.2	L&T	24/12/2009	16/06/2010	16/06/2011
	Check Meter	5462963	0.2	L&T	24/12/2009	16/06/2010	16/06/2011
Power Link System Private Limite	Main Meter	5437934	0.2	L&T	21/03/2006	16/06/2010	16/06/2011
	Check Meter	5462964	0.2	L&T	21/03/2006	16/06/2010	16/06/2011
Dempo Industries	Main Meter	5463847	0.2	L&T	24/12/2009	16/06/2010	16/06/2011
	Check Meter	5463838	0.2	L&T	24/12/2009	16/06/2010	16/06/2011
Desai Brothers	Main Meter	5437948	0.2	L&T	24/12/2009	16/06/2010	16/06/2011



	Check Meter	5463853	0.2	L&T	24/12/2009	16/06/2010	16/06/2011
Abhilash Garments & Estates (P) Ltd:	Main Meter	5463841	0.2	L&T	5/2/2007	3/6/2010	3/6/2011
	Check Meter	6760772	0.2	L&T	5/2/2007	3/6/2010	3/6/2011
Prasad Global Solutions	Main Meter	6607372	0.2	L&T	5/2/2007	3/6/2010	3/6/2011
	Check Meter	5389381	0.2	L&T	5/2/2007	3/6/2010	3/6/2010
Prasad Global Solutions	Main Meter	6675385	0.2	L&T	5/2/2007	3/6/2010	3/6/2011
	Check Meter	6675392	0.2	L&T	5/2/2007	3/6/2010	3/6/2011
Siddaganga Oil Extractions Ltd	Main Meter	5463849	0.2	L&T	5/2/2007	3/6/2010	3/6/2011
	Check Meter	6605127	0.2	L&T	5/2/2007	3/6/2010	3/6/2011
Gangadhar Narsingdas Agarwal	Main Meter	6675402	0.2	L&T	5/2/2007	3/6/2010	3/6/2011
	Check Meter	6760764	0.2	L&T	5/2/2007	3/6/2010	3/6/2011
Gangadhar Narsingdas Agarwal	Main Meter	6675414	0.2	L&T	6/2/2007	3/6/2010	3/6/2011
	Check Meter	6675384	0.2	L&T	6/2/2007	3/6/2010	3/6/2011

The calibration frequency for the monitoring period is not in adherence with the calibration frequency mentioned in the registered PDD. However during the last calibration which is valid until 31/08/2010 or later, meters were found to be operating within accuracy limits. Therefore as per EB 52, Annex 60, Para 4a, maximum permissible error to the electricity export and import has been applied for calculation of emission reductions.

The main and the backup meters are calibrated once each year. The LCS meters do not require calibration as the energy readings of electricity generated at the LCS meter is cross verified by the energy calculated by inverting system installed in the WEGs. In case there is any mismatch in the energy values recorded by the LCS meter and the energy values calculated by the inverting system; the machine will stop working and generate the error report. Therefore there is no data uncertainty. The line diagrams showing all relevant monitoring points are appendix 1.

SECTION D. Data and parameters

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D.1. Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors

Data / Parameter:	$EF_{OM,r}$
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Data unit:	tCO ₂ e/MWh						
Description:	Operating Margin Emission Factor of Southern Regional Electricity Grid						
Source of data used:	<p>“CO₂ Baseline Database for Indian Power Sector” published by the Central Electricity Authority, Ministry of Power, Government of India.</p> <p>The “CO₂ Baseline Database for Indian Power Sector” is available at www.cea.nic.in</p>						
Value(s) :	<table border="1"> <tr> <td>2002 – 03</td><td>0.9970</td></tr> <tr> <td>2003 – 04</td><td>1.0094</td></tr> <tr> <td>2004 – 05</td><td>1.0038</td></tr> </table>	2002 – 03	0.9970	2003 – 04	1.0094	2004 – 05	1.0038
2002 – 03	0.9970						
2003 – 04	1.0094						
2004 – 05	1.0038						
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline Emission Calculations						
Additional comment:	None						

Data / Parameter:	$EF_{BM,y}$		
Data unit:	tCO ₂ e/MWh		
Description:	Build Margin Emission Factor of Southern Regional Electricity Grid		
Source of data used:	<p>“CO₂ Baseline Database for Indian Power Sector” published by the Central Electricity Authority, Ministry of Power, Government of India.</p> <p>The “CO₂ Baseline Database for Indian Power Sector” is available at www.cea.nic.in</p>		
Value(s) :	<table border="1"> <tr> <td>2004 – 05</td><td>0.718</td></tr> </table>	2004 – 05	0.718
2004 – 05	0.718		
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline Emission Calculations		
Additional comment:	None		

Data / Parameter:	$EF_{CM,y}$
Data unit:	tCO ₂ e/MWh
Description:	Combined Margin Emission Factor of Southern Regional Electricity Grid
Source of data used:	<p>“CO₂ Baseline Database for Indian Power Sector” published by the Central Electricity Authority, Ministry of Power, Government of India.</p> <p>The “CO₂ Baseline Database for Indian Power Sector” is available at www.cea.nic.in</p>
Value(s) :	0.93204
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline Emission Calculations
Additional comment:	None

D.2. Data and parameters monitored



Data / Parameter:	EGy
Data unit:	MWh (Mega-Watt hour)
Description:	Net electricity supplied to the grid by the Project
Measured /Calculated /Default:	Calculated from measured values
Source of data:	Electricity supplied to the grid as per the tariff invoices raised on KPTCL/BESCOM.
Value(s) of monitored parameter:	30,162 MWh
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline Emission Calculations
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Calculated as per formulas better described under section C.
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	$EG_y = EG_{\text{export}} - 115\% * EG_{\text{import}} - T_L$
QA/QC procedures applied:	QA/QC procedures will be as implemented by KPTCL/BESCOM pursuant to the provisions of the power purchase agreement.

SECTION E. Emission reductions calculation

E.1. Baseline emissions calculation

>>

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 (932.04 tCO₂e/GWh fixed ex-ante). Refer Appendix 3 for detail.

Emission reduction calculation for the period 01/04/2010 to 31/08/2010:

$$\begin{aligned}
 \text{Emission Reductions (ER)} &= 30,161,538^2 (\text{Kwh}) * 932.04 (\text{tCO}_2/\text{Kwh}) / 10^6 \\
 &= \mathbf{28,110 \text{ tCO}_2}
 \end{aligned}$$

E.2. Project emissions calculation

>>

² The project was registered on 18th March 2010. Joint Meter Reading (JMR) is taken 1st of every month and invoices are also prepared monthly. Therefore, the generation for the period 18th March 2010 to 31st March 2010 is forgone. The generation is taken for the period of 1/04/2010 to 31/08/2010 for the first monitoring period.



The project activity is a renewable energy project which generates electricity using wind power. Hence, there are no project emissions.

E.3. Leakage calculation

>>

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

E.4. Emission reductions calculation / table

>>

The total emission reductions achieved during the monitoring period is **28,110** tCO₂. The detailed calculation is provided in appendix 2.

Total baseline emissions: 28,110 tCO₂

Total project emissions: Zero

Total leakage: Zero

$$\begin{aligned}\text{Total Emission reductions, ER} &= \text{BEy} - \text{Pey} \\ &= 28,110 \text{ tCO}_2\end{aligned}$$

E.5. Comparison of actual emission reductions with estimates in the CDM-PDD

>>

Item	Values applied in ex-ante calculation of the registered CDM-PDD	Actual values reached during the monitoring period
Emission reductions (tCO ₂ e)	27,571 (153 days equivalent of annually 65,774 emission reductions estimated in the registered PDD)	28,110

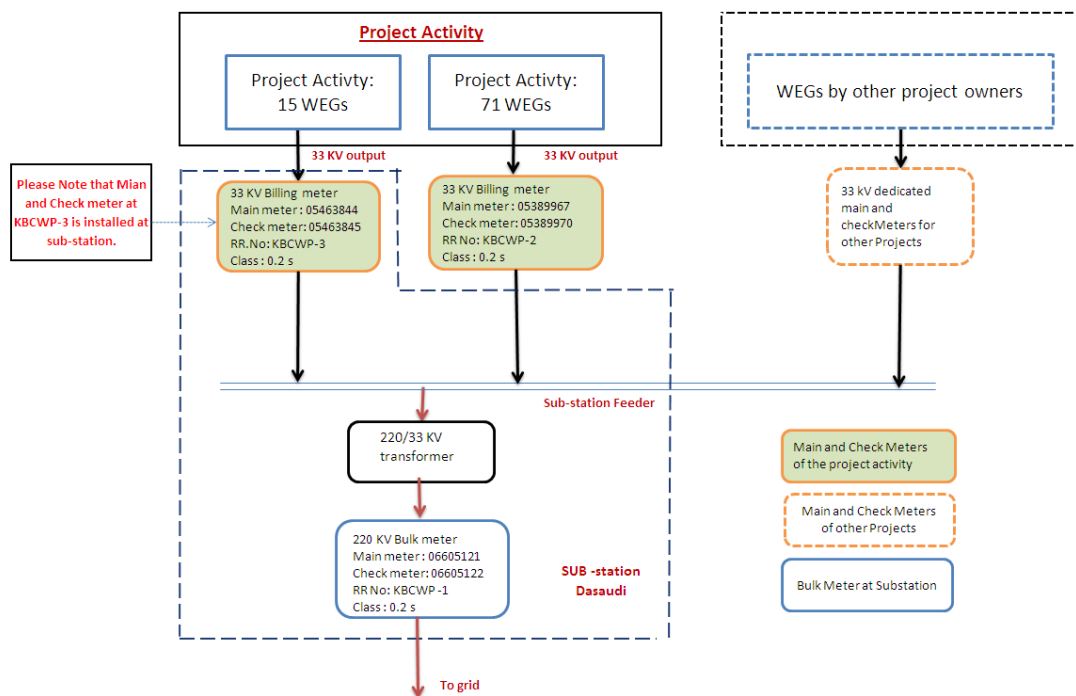
E.6. Remarks on difference from estimated value in the PDD

>

Emission reduction value in the monitoring period is 1.9% higher as compared to the value estimated in the PDD, which is due to slightly higher PLF observed at project site during the monitoring period.



Appendix 1: Line Diagram Showing Relevant Metering Points



**Appendix 2: Net Electricity Exported to Grid (EGy)**

S No.	Name of Customer	No. of M/C	Month	Energy Exported (EG _{export})	Energy Imported (EG _{import})	Transmission loss (TE)	Net Energy (EG _y)
1	Enercon Wind Farms (Chitradurga) Pvt Ltd	11	Apr-10	598800	4800	0	593280
2	Panama Business Centre	2		93360	600	2220	90450
3	Balasahab Ladkat	2		106320	720	2528	102964
4	Elpro International	1		59460	600	1414	57356
5	Gautam Ladkat	1		44280	360	1053	42813
6	Panama Infrastructure	2		81840	600	1946	79204
7	Sameer Ladkat	1		46800	480	1113	45135
8	Steelfab Offshore	1		59100	420	1405	57212
9	MK Agrotech Private Ltd	2		133200	600	3167	129343
10	Srinivas Sirigeri	1		38640	480	650	37438
11	Dempo Industries	1		39960	480	673	38735
12	Desai Brothers	1		54360	12060	915	39576
13	Dewanchand Ramsaran	1		61620	420	1465	59672
14	Abhilash Garments & Estates (P) Ltd	1		60240	600	1405	58145
15	Prasad Global Solutions	1		58980	480	1376	57052
	Prasad Global Solutions	1		57240	540	1335	55284
16	Gangadhar Narsingdas Agarwal	3		175650	750	4097	170691
	Gangadhar Narsingdas Agarwal	2		133440	720	3113	129499
17	Siddaganga Oil Extractions Ltd.	2		151080	480	3524	147004
18	Power Link System Private Limited	1		41100	480	692	39856
1	Enercon Wind Farms (Chitradurga) Pvt Ltd	11	May-10	1919400	2400	0	1916640
2	Panama Business Centre	2		194040	240	2833	190931
3	Balasahab Ladkat	2		213360	240	3115	209969
4	Elpro International	1		122340	240	1786	120278
5	Gautam Ladkat	1		106200	180	1551	104442



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6	Panama Infrastructure	2	Jun-10	116880	360	1706	114760
7	Sameer Ladkat	1		83820	240	1224	82320
8	Steelfab Offshore	1		101580	180	1483	99890
9	MK Agrotech Private Ltd	2		276000	360	4030	271556
10	Srinivas Sirigeri	1		94620	300	1107	93168
11	Dempo Industries	1		100020	240	1170	98574
12	Desai Brothers	1		111300	360	1302	109584
13	Dewanchand Ramsaran	1		97500	180	1424	95869
14	Abhilash Garments & Estates (P) Ltd	1		121380	660	3199	117422
15	Prasad Global Solutions	1		125820	300	3316	122159
	Prasad Global Solutions	1		117960	300	3109	114506
16	Gangadhar Narsingdas Agarwal	3		419550	450	11058	407975
	Gangadhar Narsingdas Agarwal	2		269280	480	7098	261630
17	Siddaganga Oil Extractions Ltd.	2		292200	480	7702	283946
18	Power Link System Private Limited	1		97320	240	1139	95905
1	Enercon Wind Farms (Chitradurga) Pvt Ltd	11		2582400	600	0	2581710
2	Panama Business Centre	2		344160	120	3462	340560
3	Balasaheb Ladkat	2		355200	120	3573	351489
4	Elpro International	1		182640	120	1837	180665
5	Gautam Ladkat	1		190680	60	1918	188693
6	Panama Infrastructure	2		227880	120	2292	225450
7	Sameer Ladkat	1		146880	60	1478	145333
8	Steelfab Offshore	1		171540	120	1726	169676
9	MK Agrotech Private Ltd	2		392280	120	3946	388196
10	Srinivas Sirigeri	1		157680	180	1594	155879
11	Dempo Industries	1		172260	120	1742	170380
12	Desai Brothers	1		192780	60	1949	190762
13	Dewanchand Ramsaran	1		168300	120	1693	166469
14	Abhilash Garments & Estates (P) Ltd	1		182940	180	4369	178364



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15	Prasad Global Solutions	1		167100	60	3991	163040
	Prasad Global Solutions	1		157500	60	3762	153669
16	Gangadhar Narsingdas Agarwal	3		542100	150	12947	528981
	Gangadhar Narsingdas Agarwal	2		346800	120	8283	338379
17	Siddaganga Oil Extractions Ltd.	2		359040	120	8575	350327
18	Power Link System Private Limited	1		165900	120	1677	164085
1	Enercon Wind Farms (Chitradurga) Pvt Ltd	11	Jul-10	3145800	0	0	3145800
2	Panama Business Centre	2		417480	0	6392	411088
3	Balasahab Ladkat	2		434040	0	6645	427395
4	Elpro International	1		199740	60	3058	196613
5	Gautam Ladkat	1		238620	60	3653	234898
6	Panama Infrastructure	2		286800	0	4391	282409
7	Sameer Ladkat	1		178620	0	2735	175885
8	Steelfab Offshore	1		200400	0	3068	197332
9	MK Agrotech Private Ltd	2		402840	0	6167	396673
10	Srinivas Sirigeri	1		194220	120	1851	192231
11	Dempo Industries	1		211620	60	2017	209534
12	Desai Brothers	1		234420	240	2234	231910
13	Dewanchand Ramsaran	1		196440	0	3007	193433
14	Abhilash Garments & Estates (P) Ltd	1		258720	60	6660	251991
15	Prasad Global Solutions	1		224040	0	5767	218273
	Prasad Global Solutions	1		194280	60	5001	189210
16	Gangadhar Narsingdas Agarwal	3		647250	150	16662	630416
	Gangadhar Narsingdas Agarwal	2		480240	0	12363	467877
17	Siddaganga Oil Extractions Ltd.	2		485400	0	12496	472904
18	Power Link System Private Limited	1		196860	60	1876	194915
1	Enercon Wind Farms (Chitradurga) Pvt Ltd	11	Aug-10	2579400	600	0	2578710
2	Panama Business Centre	2		380520	0	4928	375592
3	Balasahab Ladkat	2		377880	120	4871	372871



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4	Elpro International	1	184260	0	2375	181885
5	Gautam Ladkat	1	203460	60	2623	200768
6	Panama Infrastructure	2	244080	120	3146	240796
7	Sameer Ladkat	1	157680	60	2032	155579
8	Steelfab Offshore	1	185880	60	2396	183415
9	MK Agrotech Private Ltd	2	355920	120	4588	351194
10	Srinivas Sirigeri	1	158280	120	1244	156898
11	Dempo Industries	1	178260	120	1401	176721
12	Desai Brothers	1	213840	60	1681	212090
13	Dewanchand Ramsaran	1	180600	60	2328	178203
14	Abhilash Garments & Estates (P) Ltd	1	216360	60	5329	210962
15	Prasad Global Solutions	1	187500	120	4618	182744
	Prasad Global Solutions	1	163800	60	4035	159696
16	Gangadhar Narsingdas Agarwal	3	566850	0	13962	552888
	Gangadhar Narsingdas Agarwal	2	397320	120	9787	387395
17	Siddaganga Oil Extractions Ltd.	2	407880	120	10047	397695
18	Power Link System Private Limited	1	173220	180	1362	171651