

Grouped Wind Power Project in India

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¹ http://www.vcsprojectdatabase.org/#/project_details/429

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1 PROJECT DETAILS

1.1 Summary Description of the Project

Purpose of the project activity:

The present bundled project activity deals with generation of electricity using wind energy by Wind Turbine Generator (WTG). The project utilizes wind energy for generating electricity which otherwise would have been generated through operation of or new addition of alternate fuels (fossil fuel) based power plants in regional grid, which would lead to GHG emissions. The project contributing to reduction in specific emissions (pollutants generated from energy generation) including GHG emissions. Apart from generation of renewable electricity, the project has also conceived for the following:

- To enhance the propagation of commercialisation of wind turbines in the region
- To contribute to the sustainable development of the region, socially, environmentally and economically
- To reduce the prevalent regulatory risk for this project through revenues from emission trade

The annual average of estimated electricity generation and estimated emission reduction over 10 years of crediting period will be 145,539 MWh/year and 140,590 tCO₂e per year

Brief description of the installed technology and equipments:

The wind turbine converts wind's kinetic energy into electricity. This project activity based on an environmentally safe technology provided by the various wind technology suppliers i.e. NEPC, Pioneer Wincon, Suzlon Ltd., NEG Micon, Gamesa Eolica. The aggregate capacity of project is 74.9 MW consisting 68.875 MW grid-connected and 6.025 MW captive renewable electricity generations. The project activity involves 72 project promoters which comprises installation of total 111 No's WTGs ranging from 0.225 to 1.5 MW.

Sr. No	Technology Supplier	WTG Capacity (MW)	No. of WTGs	Total installed Capacity (MW)
1	NEPC	0.225	26	5.85
2	Pioneer Wincon	0.25	2	0.5
3	Suzlon	0.35	8	2.8
4	NEPC	0.5	1	0.5
5	Suzlon	0.6	39	23.4
6	NEG MICON	0.75	4	3
7	GamesaEolica	0.85	1	0.85
8	Suzlon	1.25	28	35
9	Suzlon	1.5	2	3
		Total	111	74.9

All the above WTGs in the project have been developed indigenously and no transfer of technology is involved.

The project is a grouped project of 72 project promoters with capacity of WTGs ranging from 0.225 to 1.5 MW.

The capacity of the grouped project and other details has been furnished in the table - 1 below.

Table 1: Details of Wind Electric Generator (WEGs) Installed State Wise in India

Sr. No.	Name of Project Promoter	Installed Capacity	Commissioning Date	Village	District	Electricity Usage
Maharashtra						
1	Pragati Agencies	1.25	31/03/2006	Dahiwadi	Sangli	STG
2	Umang Textiles	0.60	21/06/2006	Nagaj	Sangli	STG
3	Ankur Textiles	0.60	30/03/2006	Shelkewadi	Sangli	STG
4	Vandana Textiles	0.60	31/03/2006	Kundlapur	Sangli	STG
5	Sun Irrigation System (P) Ltd.	0.60	30/03/2006	Shelkewadi	Sangli	STG
6	Jathar Textiles Pvt. Ltd.	0.60	31/03/2006	Kundlapur	Sangli	STG
7	B. C. Chadrashekhkar	0.60	19/05/2006	Kundlapur	Sangli	STG
8	B.C. Shivakumar	0.60	19/05/2006	Garjewadi	Sangli	STG
9	Aerolex Cablenet	1.25	28/03/2006	Jarandi	Sangli	STG
10	B. S. Channabasappa & Sons	1.25	31/03/2006	Tisangi	Sangli	STG
11	Air Control (India) Pvt. Ltd.	0.60	31/03/2008	Sonawade	Sangli	STG
12	Bengal Cardboard Industries & Printers Pvt. Ltd.	0.60	1/11/2006	Aichale	Dhule	STG
13	Chaphekar Engineering Pvt. Ltd.	0.60	30/12/2006	Shirsatwadi	Sangli	STG
14	Economic Explosives Limited	1.25	31/03/2006	Vavad	Nandurbar	STG
15	Jsons Foundry Private Limited	0.60	5/8/2008	Sonawade	Sangli	STG
16	Jsons Foundry Private Limited	0.60	19/04/2008	Sonawade	Sangli	STG
17	Jsons Foundry Private Limited	0.60	28/03/2007	Charan (Gudepanchgani)	Sangli	STG
18	Western Precicast Pvt Ltd	1.25	29/03/2006	Chakla	Nandurbar	STG
19	Metal Link Alloys Ltd.	1.25	26/05/2006	Amkhel	Dhule	STG
20	Naik Sea Foods Ltd.	0.60	8/11/2006	Aichale	Dhule	STG
21	RDS Construction Company	0.60	8/11/2006	Aichale	Dhule	STG
22	Silverline Investment Co. Pvt. Ltd.	0.60	1/11/2006	Aichale	Dhule	STG
23	Sushila Overseas	0.60	19/05/2006	Shelkewadi	Sangli	STG
24	Vostok (Fareast) Securities Pvt. Ltd.	0.60	20/12/2006	Aichale	Dhule	STG
25	Shree Ambica Auto Sales & Service	1.25	31/07/2006	Jarandi	Sangli	STG

Sr. No.	Name of Project Promoter	Installed Capacity	Commissioning Date	Village	District	Electricity Usage
26	Unirose Textile Processors Pvt. Ltd.	0.60	18/08/2006	Tisangi	Sangli	STG
27	B. S. C. Textiles	0.60	29/09/2006	Tisangi	Sangli	STG
28	P. Vijaya Kumar	0.60	29/09/2006	Wagholi	Sangli	STG
29	B. C. Umapathy (smaller HUF)	0.60	29/9/2006	Nagaj	Sangli	STG
30	P. Mohan Lal	0.60	29/9/2006	Wagholi	Sangli	STG
31	S. K. Veerbhadrappa & Co	0.60	29/9/2006	Shelkewadi	Sangli	STG
32	Sree Veerbhadreshwara Rice & Flour Mill	0.60	29/9/2006	Garjewadi	Sangli	STG
33	GEM Lab. Pvt. Ltd.	1.25	11/5/2006	Amkhel	Dhule	STG
34	GEM Lab. Pvt. Ltd.	1.25	16/08/2006	Panhalipada	Dhule	STG
35	Sri Anjaneya Cotton Mills Pvt. Ltd.	1.25	23/3/2006	Amkhel	Dhule	STG
36	Sri Anjaneya Cotton Mills Pvt. Ltd.	1.25	29/3/2006	Amkhel	Dhule	STG
37	Harshita Sales Corporation	0.60	30/9/2006	Garjewadi	Sangli	STG
38	Ushahkal Nursing Home	0.60	26/09/2006	Nagaj	Sangli	STG
39	Mahabal Auto Ancillaries Pvt. Ltd	1.25	25/03/2006	Birenwadi	Sangli	STG
40	Mahabal Metals Pvt. Ltd	1.25	29/03/2007	Akrale	Nandurbar	STG
41	Mahalaxmi Infraprojects Limited	1.50	3/9/2007	Gangapur	Nandurbar	STG
42	Agarwal Packaging Pvt. Ltd.	1.25	29/09/2005	Dhalgaon / Kundlapur	Sangli	STG
43	Agarwal Packaging Pvt. Ltd.	0.60	30/12/2006	Panumbre (Gudepanchgani)	Sangli	STG
44	Choudhary Exports	1.25	11/8/2006	Jamde	Dhule	STG
45	Runwal Developers Pvt. Ltd.	1.25	31/3/2004	Khori	Dhule	STG
46	Runwal Developers Pvt. Ltd.	1.25	25/3/2005	Khori	Dhule	STG
47	Kulkarni Power Tools Ltd.	1.25	29/9/2006	Jamde	Dhule	STG
Tamilnadu						
48	Jsons Fountry Private Limited	0.225	28/09/2005	Veppilankulam	Tirunelveli	STG

Sr. No.	Name of Project Promoter	Installed Capacity	Commissioning Date	Village	District	Electricity Usage
49	Jsons Fountry Private Limited	0.225	28/09/2005	Veppilankulam	Tirunelveli	STG
50	Jsons Fountry Private Limited	0.225	30/09/2005	Veppilankulam	Tirunelveli	STG
51	Jsons Fountry Private Limited	0.225	30/09/2005	Veppilankulam	Tirunelveli	STG
52	Jsons Fountry Private Limited	0.225	21/02/2007	Veppilankulam	Tirunelveli	STG
53	Jsons Fountry Private Limited	0.225	21/02/2007	Veppilankulam	Tirunelveli	STG
54	Jsons Fountry Private Limited	0.225	21/02/2007	Veppilankulam	Tirunelveli	STG
55	Western Precicast Pvt. Ltd.	0.225	24/02/2007	Veppilankulam	Tirunelveli	STG
56	P.M.P. Textiles Spinning Mills Limited	0.50	9/9/2004	Anthiyur	Coimbatore	CPP
57	RCR Eco-Power	0.225	22/03/2005	Veppilankulam	Tirunelveli	STG
58	RCR Eco-Power	0.225	22/03/2005	Veppilankulam	Tirunelveli	STG
59	RCR Eco-Power	0.35	31/03/2006	Myvadi	Tirunelveli	STG
60	RCR Eco-Power	0.35	15/02/2007	Thandayarkulam	Tirunelveli	STG
61	RCR Eco-Power	0.60	27/09/2007	Kulayaneri	Tirunelveli	STG
62	Shankarlal	0.225	3/2/2007	Veppilankulam	Tirunelveli	STG
63	B. S. C. Textiles	0.225	31/03/2006	Veppilankulam	Tirunelveli	STG
64	B. S. C. Textiles	0.225	31/03/2006	Veppilankulam	Tirunelveli	STG
65	B. S. C. Textiles	0.225	19/12/2006	Veppilankulam	Tirunelveli	STG
66	P. Vijaya Kumar	0.225	21/04/2006	Perungudi	Tirunelveli	STG
67	P. Vijaya Kumar	0.225	30/09/2005	Thandayarkulam	Tirunelveli	STG
68	O. B. Agarwal	0.225	3/2/2007	Veppilankulam	Tirunelveli	STG
69	Radha-Mohan Processors	0.225	31/03/2006	Veppilankulam	Tirunelveli	STG
70	Swadeshi Dyeing & Bleaching Mills Private. Limited	0.225	31/03/2006	Veppilankulam	Tirunelveli	STG
71	B. S. Channabasappa & Sons	0.225	31/03/2006	Veppilankulam	Tirunelveli	STG
72	B. S. Channabasappa & Sons	0.225	31/03/2006	Veppilankulam	Tirunelveli	STG
73	B. S. Channabasappa & Sons	0.225	19/12/2006	Veppilankulam	Tirunelveli	STG
74	P. Mohan Lal	0.225	29/03/2006	Thandayarkulam	Tirunelveli	STG
75	P. Mohan Lal	0.225	30/09/2005	Thandayarkulam	Tirunelveli	STG
76	Operational Energy group India (P) Pvt Ltd (Previously: Dr. Santosh Prabhu)	0.225	30/03/2005	Veppilankulam	Tirunelveli	STG
77	Operational Energy group India	0.225	31/03/2005	Veppilankulam	Tirunelveli	STG

Sr. No.	Name of Project Promoter	Installed Capacity	Commissioning Date	Village	District	Electricity Usage
	(P) Pvt Ltd (Previously: Dr. Santosh Prabhu)					
78	Mahalingashetty & Co. Ltd.	0.60	4/2/2007	Rajampatti	Dindigul	STG
79	Sri Venkatachalapathy Spinning Mills Pvt. Ltd.	0.75	13/03/2006	Karuvantha	Tirunelveli	CPP
80	Sri Venkatachalapathy Spinning Mills Pvt. Ltd.	0.75	27/03/2006	Karuvantha	Tirunelveli	CPP
81	Choudhary Exports	1.25	30/03/2006	Govindpuram	Erode	STG
82	Ramraj Handlooms	0.85	24/3/2005	Karungulam	Tirunelveli	STG
83	Ramraj Handlooms	0.75	30/12/2005	Uthupalayam	Erode	STG
84	Ramraj Handlooms	0.75	31/7/2006	Azhagiapandiapuram	Tirunelveli	STG
85	N. Sumati	0.25	29/3/2005	Sellakarachal	Coimbatore	STG
86	K. R. Nagarajan	0.25	29/3/2005	Sellakarachal	Coimbatore	STG
Gujarat						
87	Air Control (India) Pvt. Ltd.	0.60	29/03/2008	Kuchhadi	Porbandar	STG
88	Badawe Engineers Pvt. Ltd.	0.60	29/03/2008	Kuchhadi	Porbandar	STG
89	Pragati Glass Pvt. Ltd.,	1.25	28/02/2007	Lamba	Jamnagar	CPP
90	Siddharth Infra Tech Pvt. Ltd	0.60	29/03/2008	Kuchhadi	Porbandar	STG
91	Agarwal Enterprises	0.60	29/03/2008	Visawada	Porbandar	STG
92	Agarwal Enterprises	0.60	29/03/2008	Visawada	Porbandar	STG
93	Unique Sugars Ltd.	1.50	24/04/2007	Suthri	Kutch	STG
94	Jaychandra Agro Industries Pvt. Ltd.	0.60	25/06/2007	Sandhan	Kutch	STG
Rajasthan						
95	Shree Ram Hotels	0.35	30/03/2006	Pohra	Jaisalmer	CPP/STG (50:50)
96	Chhabra Syncotex Ltd.	0.60	15/03/2008	Sadiya	Jaisalmer	STG
97	Chhabra Syncotex Ltd.	0.60	29/03/2007	Barabaug	Jaisalmer	STG
98	Chhabra Syncotex Ltd.	0.35	30/03/2006	Pohra	Jaisalmer	CPP

Sr. No.	Name of Project Promoter	Installed Capacity	Commissioning Date	Village	District	Electricity Usage
99	Sona Processors (India) Ltd.	0.35	30/03/2006	Pohra	Jaisalmer	CPP
100	Delhi Rajasthan Transport Co. Ltd.	0.35	18/10/2006	Barabaug	Jaisalmer	STG
101	Metro Cement and Mines Pvt. Ltd.	0.60	29/03/2007	Barabaug	Jaisalmer	CPP
102	Sarvodaya Suitings Ltd	0.35	30/9/2004	Baramsar	Jaisalmer	CPP
103	Sarvodaya Suitings Ltd	0.35	31/3/2004	Baramsar	Jaisalmer	CPP
104	Free India Energy	1.25	14/3/2004	Soda	Jaisalmer	STG
Karnataka						
105	S C Shettar and Sons	1.25	31/03/2008	Kappatgudda	Gadag	STG
106	Swarna Constructions	1.25	31/03/2008	Kappatgudda	Gadag	STG
107	Suresh Kumar Sharma (HUF)	1.25	25/09/2006	Harogiri / Kappatgudda hills	Gadag	STG
108	BEML Limited	1.25	20/12/2007	Bidnahal, Kappatgudda hills	Gadag	STG
109	BEML Limited	1.25	20/12/2007	Bidnahal, Kappatgudda hills	Gadag	STG
110	BEML Limited	1.25	20/12/2007	Bidnahal, Kappatgudda hills	Gadag	STG
111	BEML Limited	1.25	20/12/2007	Bidnahal, Kappatgudda hills	Gadag	STG

1.2 Sectoral Scope and Project Type

Sectoral Scope : 1, Energy industries (renewable - / non-renewable sources)

Type : Renewable energy projects (Large Scale)

Category : ACM 0002 - Consolidated methodology for grid-connected electricity generation from renewable sources (version – 17, EB 89)

The methodology refers to ACM 0002 to the latest approved version of following tools-

- “Tool for the demonstration and assessment of additionality” version 07
- “Tool to calculate the emission factor for an electricity system” version 06
- “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period” version 3.0.1

The Project is not grouped project activity as per VCS guideline

1.3 Project Proponent

Organization name	Pragati Agencies
Contact person	Mr. A.K. Goenka
Title	Manager
Address	Vishnu Chambers, Shahu Corner, Ichalkarnji - 416 115, District Kolhapur, Maharashtra, India.
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Organization name	Umang Textiles
Contact person	Mr. A.K. Goenka
Title	Manager
Address	Vishnu Chambers, Shahu Corner, Ichalkarnji - 416 115, District Kolhapur, Maharashtra, India.
Telephone	0230 -2432552
Email	vishnutex@bsnl.in vishnutex@sancharnet.in

Organization name	Ankur Textiles
Contact person	Mr. A.K. Goenka
Title	Manager
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Telephone	0230 -2432552
Email	vishnutex@bsnl.in vishnutex@sancharnet.in

Organization name	Vandana Textiles
Contact person	Mr. A.K. Goenka
Title	Manager
Address	Vishnu Chambers, Shahu Corner, Ichalkarnji - 416 115, District Kolhapur, Maharashtra, India.
Telephone	0230 -2432552
Email	vishnutex@bsnl.in vishnutex@sancharnet.in

Organization name	Sun Irrigation System (P) Ltd.
Contact person	Mr. S.K. Parik
Title	Director
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Telephone	91-93260 10101
Email	pvc_sunflow@rediffmail.com kpr_sunfab@rediffmail.com

Organization name	Jathar Textiles Pvt Ltd.
Contact person	Manohar Balkrishna Jathar
Title	Director
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Email	jathargroup@sancharnet.in

Organization name	B. C. Chadrashekhar
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Contact person	Mr. B. C. Chandra Shekhar
Title	Proprietor
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Email	bscdvg@rediffmail.com

Organization name	B.C. Shivakumar
Contact person	Mr. B. C. Shivakumar
Title	Proprietor Contact
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Telephone	08192-231348, 222170
Email	bscdvg@rediffmail.com

Organization name	Aerolex Cablenet
Contact person	Mr. S. T. Wadhwa
Title	Partner
Address	"Aerolex Center", No. 109, 3rd Floor, K. H. Road, Bangalore-560 027, India
Telephone	91-9945511025
Email	aerolex@vsnl.com

Organization name	B. S. Channabasappa& Sons
Contact person	Mr. B. C. Umapathy
Title	Partner
Address	Cloth Merchants, 1194, Kalikadevi Road, Davangere – 577 001, Karnataka
Telephone	08192-231348, 222170
Email	bscdvg@rediffmail.com

Organization name	Air Control (India) Pvt. Ltd.,
Contact person	Mr. Nachiket Patil
Title	Director
Address	Adam's Court, Baner Road, Pune- 411 045, Maharashtra, India
Telephone	91-9764499933
Email	aircontrolindia@gmail.com

Organization name	Bengal Cardboard Industries & Printers Pvt. Ltd.
Contact person	Mr. Rajkumar Saraf
Title	Director

Address	Oricon House, 4 th floor, 12 Rampart Road, Fort, Mumbai- 400 023, India
Telephone	91-9869421174
Email	sarafdevelopers@gmail.com

Organization name	Chaphekar Engineering Pvt. Ltd.
Contact person	Mr. Sachin Chaphekar
Title	Director
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Telephone	91-20-66524877 / 78
Email	sachin@chaphekarengg.com enquiry@chaphekarengg.com

Organization name	Economic Explosives Limited.
Contact person	Mr. Nilesh Panpaliya
Title	VP (finance)
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Telephone	91-712-2561000
Email	nilesh@solarexplosives.com

Organization name	Jsons Fountry Private Limited
Contact person	Mr. V. P. Jagadale
Title	Director
Address	Gat No. 170, Near Kupwad M. I. D. C. Village-Savali, Taluka-Miraj, Sangli, Maharashtra – 416 410, India
Telephone	91-9890441819
Email	jagdale.vp@gmail.com jsonsgroup.windpower@gmail.com

Organization name	Western Precicast Pvt Limited
Contact person	Mr. V. P. Jagadale
Title	Director
Address	Gat No 170, Near Kupwad Block, M.I.D.C, Village Savali Taluka Miraj, Dist. Sangli-418410, Maharashtra, India
Telephone	91-9890441819
Email	jagdale.vp@gmail.com jsonsgroup.windpower@gmail.com

Organization name	Metal Link Alloys Limited
Contact person	Mr. Bhavesh Soni
Title	Marketing Manager

Address	36, Nirdhar, Mughbat X Lane, Girgaon, Mumbai- 400 004, Maharashtra, India
Telephone	91-9619890919
Email	metallink@bronze-ingot.com

Organization name	Naik Sea Foods Limited
Contact person	Mr. Abhishek Ambukar
Title	Export Executive
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Email	naikacc9@hotmail.com

Organization name	RDS Construction Company
Contact person	Mr. R. D. Shinde
Title	Partner
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Telephone	91-989067207
Email	mahacon@vsnl.net

Organization name	Silverline Investment Co. Pvt. Ltd.
Contact person	Mr. Rajkumar Saraf
Title	Director
Address	Oricon House, 4 th floor, 12 Rampart Road, Fort, Mumbai- 400 023, India
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Organization name	Sushila Overseas,
Contact person	Mr. Surendra Jindal
Title	Partner
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Organization name	Vostok (Fareast) Securities Pvt. Ltd.
Contact person	Mr. Pankaj Saraf
Title	Director
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Telephone	91-22-22840268
Email	sarafdevelopers@gmail.com

Organization name	Shree Ambica Auto Sales & Service
Contact person	Mr. Shailesh V. Modi
Title	Partner
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Organization name	Unirose Textile Processors Pvt. Ltd.
Contact person	Mr. F. G. Shirgave
Title	Director
Address	40,41,65-68,Sector –B, Shri Laxmi Sahakari Aoudyogik Vasahat Ltd., Hatkanangale, Dist.Kolhapur- 382715, Maharashtra state, India
Telephone	0230-2366228,2366120
Email	unirose678@rediffmail.com

Organization name	B. S. C. Textiles
Contact person	Mr. B. C. Shivakumar
Title	Partner
Address	# 1189, Kalikadevi Road, Davangere- 577 001, Karnataka state, India
Telephone	08192- 231348
Email	bscdvg@rediffmail.com ; abhiraj@hotmail.com

Organization name	P. Vijaya Kumar
Contact person	Mr. P. Vijaya Kumar
Title	Proprietor
Address	# 174/1 Opp. B. T. Jain Temple, Narasaraj Road, Davangere- 577 001, Karnataka state, India
Telephone	08192 277 045
Email	sanghvivm@rediffmail.com

Organization name	B. C. Umapathy (smaller HUF)
Contact person	Mr. B. C. Umapathy
Title	Proprietor
Address	# 1189, Kalikadevi Road, Davangere- 577 001, Karnataka state, India
Telephone	08192- 231348
Email	hemrag@rediffmail.com

Organization name	P. Mohan Lal
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Contact person	Mr. P. Mohan Lal
Title	Proprietor
Address	# 174/1 Opp. B. T. Jain Temple, Narasaraj Road, Davangere-577 001, Karnataka state, India
Telephone	08192 277 045
Email	sanghvivm@rediffmail.com

Organization name	S. K. Veerbhadrappa & Co
Contact person	Mr. S. K. Shashidhar
Title	Partner
Address	Poona – Bangalore Road, Davangere - 577 002, Karnataka state, India
Telephone	08192-231376
Email	skv_co@yahoo.co.in

Organization name	Sree Veerbhadreshwara Rice & Flour Mill
Contact person	Mr. B. Siddalingappa
Title	Partner
Address	Malebennur, Harihar-577 530, Karnataka state, India
Telephone	91-9945689752
Email	hsnrao_tax@sify.com

Organization name	GEM Lab. Pvt. Ltd.
Contact person	Mr. G. M. Lingaraju
Title	Director
Address	# 22, Pamadi Tower, IIndFloor, Gandhinagar, Ist Main Road, Bangalore 560009, Karnataka state, India
Telephone	080 22203171
Email	gemplabs@rediffmail.com ; gemplabs@gmail.com

Organization name	Sri Anjaneya Cotton Mills Pvt. Ltd.
Contact person	Mr. R. Manjunath
Title	Proprietor
Address	Jayalakshmi, Poona Bangalore Road, Davangere -577 002, Karnataka state, India
Telephone	08192- 231651, 272180
Email	chetak@anjaneya.intextile@anjaneya.in

Organization name	Harshita Sales Corporation.
Contact person	Mrs. Vidhisha Bajoria
Title	Proprietor

Address	20, Shopping Centre, 1st Floor, Ichalkaranji, Kolhapur-416115, Maharashtra, India
Telephone	0230 2420882
Email	harshita_sales@rediffmail.com

Organization name	Ushahkal Nursing Home
Contact person	Dr. Milind P. Parikh
Title	Partner
Address	Opp. ZillaParishad, Miraj Road, Sangli 416 416, Maharashtra state, India
Telephone	020-25533309, 25534322
Email	ushahkal@hotmail.com

Organization name	Mahabal Auto Ancillaries Pvt. Ltd.
Contact person	Mr. Hemant Madhavrao Mahabal
Title	Director
Address	G. M. Ind., Estate, P. B. No. 38, Miraj-416 410, Maharashtra state, India
Telephone	0233-2672188
Email	hemant@mahabal.in

Organization name	Mahabal Metals Pvt. Ltd.
Contact person	Mr. Hemant Madhavrao Mahabal
Title	Director
Address	G. M. Ind., Estate, P. B. No. 38, Miraj-416 410, Maharashtra state, India
Telephone	0233-2672188
Email	hemant@mahabal.in

Organization name	Mahalaxmi Infraprojects Limited
Contact person	Ms. Veena Shinde
Title	Director
Address	363/11, BalajiNiwas, Deep Bungalow Chowk, Shivaji Nagar, Pune, Maharashtra state, India
Telephone	91-720-25652102
Email	mahacon@vsnl.net

Organization name	Agarwal Packaging Pvt. Ltd.
Contact person	Mr. Satish Gupta
Title	Director

Address	364, Gokhale Road, Pune- 411 016, Maharashtra state, India
Telephone	91-20-25654309
Email	smg@agarwalpune.com

Organization name	Choudhary Exports
Contact person	Mr. Vimal Choudhary
Title	Partner
Address	D-12, Hanuman Nagar, Vaishali Nagar, Jaipur – 302021, Rajasthan state, India
Telephone	91-1412350736
Email	vimal@choudharexports.com

Organization name	Runwal Developers Pvt. Ltd
Contact person	Mr. A.V. Rajan
Title	CFO
Address	Runwal & Omkar Esquare, 5th floor, Off: Eastern Express Highway, Opp. Sion Chunabhatti Signal, Sion (E), Mumbai 400022
Telephone	91-9967005698
Email	mohan@runwal.com

Organization name	Kulkarni Power Tools Ltd.
Contact person	Mr. Dilip Kulkarni
Title	Director
Address	Shirol, District: Kolhapur- 416 103, Maharashtra State, India
Telephone	91-9225838939
Email	suhas.kharote@kpt.co.in

Organization name	P.M.P. Textiles Spinning Mills Limited
Contact person	Mr. P. Muthuswamy
Title	Managing Director
Address	235, Mint Street, Park Town, Chennai, Tamilnadu, India
Telephone	91-9841014712
Email	tslm1960@yahoo.co.in

Organization name	RCR Eco-Power
Contact person	Mr. Raul Rodrigues
Title	Proprietor

Address	405, Raikar Chambers, Deonar Village Road, Govandi, Mumbai- 400 088, Maharashtra, India
Telephone	91-9320068848
Email	raul@balluff.co.in

Organization name	Shankarlal
Contact person	Mr. S.K. Parik ,
Title	Proprietor
Address	Kapad Market, P. Box No-162, 10/276, Ichalkaranji-416 115, Maharashtra State, India
Telephone	91-9326010101
Email	pvc_sunflow@rediffmail.com kpr_sunfab@rediffmail.com

Organization name	O. B. Agarwal
Contact person	Mr. O. B. Agarwal
Title	Proprietor
Address	12/163, Near Congress Committee, Bungalow Road, Ichalkaranji-416 115, Maharashtra State, India
Telephone	0230-2424301
Email	suryayarn@rediffmail.com

Organization name	Radha-Mohan Processors
Contact person	Mr. Chandrakant D. Mete
Title	Partner
Address	Ward No. 15, Kudche Mala, Shri Shanti Niketan Building, H. No. 9, Chandur Road, Ichalkaranji-416 115, Maharashtra State, India
Telephone	0230-2422357, 2435010
Email	radhamohanprocessors@gmail.com ; mahesh6588@yahoo.com

Organization name	Operational Energy group India (P) Pvt Ltd
Contact person	Mr. Natarajan
Title	Manager
Address	5 th Floor, Gokul arcade east, 2 & 2 A, Sardar Patel road, Adayar Chennai-600 020, Tamilnadu State, India
Telephone	044-43949300
Email	natarajan@oegindia.com

Organization name	Mahalingashetty & Co. Ltd.
Contact person	Mr. Raju Mahalingashetty
Title	Director

Address	64, Vishweshwar Nagar, Hubli – 580 032, Karnataka state, India
Telephone	91- 8362216020
Email	akkumar1@rediffmail.com

Organization name	Sri Venkatachalapathy Spinning Mills Pvt. Ltd.
Contact person	Mr. T. V. KaushikRajha
Title	Director
Address	Post Box No. 150, Door No. 1/100, S. No. 454, Kothankulam Village, Srivilliputtur Road, Rajapalayam – 626 117, Tamil Nadu state, India
Telephone	91 -4563230318
Email	svsmills@rediffmail.com

Organization name	Ramraj Handlooms
Contact person	Mr. Thiru. K. R. Nagarajan
Title	Managing Director
Address	No. 22, ThulasiRao Street, Tirupur – 641 604, Tamil Nadu state, India
Telephone	91-421-2248147/48/49
Email	ramrajcotton@eth.net , tvln_asha@yahoo.co.in

Organization name	N. Sumati
Contact person	Mrs. N. Sumathi
Title	Proprietor
Address	Ramraj building, 10 Sengunthapuram, 1 st street, Mangalam Road, Tirupur – 641 604, Tamil Nadu state, India
Telephone	91-421-2248147/48/49
Email	ramrajcotton@eth.net , tvln_asha@yahoo.co.in

Organization name	K. R. Nagarajan
Contact person	Mr. Thiru. K. R. Nagarajan
Title	Proprietor
Address	Ramraj building, 10 Sengunthapuram, 1 ^s street, Mangalam Road, Tirupur – 641 604, Tamil Nadu state, India
Telephone	91-421-2248147/48/49
Email	ramrajcotton@eth.net ; tvln_asha@yahoo.co.in

Organization name	Badawe Engineers Pvt. Ltd.
Contact person	Mr. S. V. Badawe
Title	Director

Address	26, Amar Society, Gulmohar Path, Erandwane, Pune- 411 004, Maharashtra, India
Telephone	020-25433879
Email	bepl@badawegroup.com

Organization name	Pragati Glass Pvt. Ltd.,
Contact person	Mr. H. R. Bhandari
Title	President
Address	111, Camji Shamji Industrial Complex, 9, L. B. S. Marg (W), Mumbai- 400 070, Maharashtra, India
Telephone	91-9930453208
Email	president@pragatiglass.com

Organization name	Siddharth Infra Tech Pvt. Ltd
Contact person	Mr. Sunil Kotecha
Title	Proprietor
Address	141, Navi Peth, Jalgaon-425 001 (M.S.), Maharashtra, India
Telephone	91-9822372223
Email	smkotecha@yahoo.com

Organization name	Agarwal Enterprises
Contact person	Mr. Satish Gupta
Title	Director
Address	364, Gokhale Road, Pune – 411 016, Maharashtra state, India
Telephone	91-20-25654309
Email	smg@agarwalpune.com

Organization name	Unique Sugars Ltd.
Contact person	Mr. P. J. Dewang
Title	Sr. Manager
Address	Rawal Industrial Estate, Dadanagar, Doindaicha – 425 408, Maharashtra state, India
Telephone	91-9422286328
Email	mumbai@universalstarch.com

Organization name	Jaychandra Agro Industries Pvt. Ltd.
Contact person	Mr. P. J. Dewang
Title	Sr. Manager

Address	Rawal Industrial Estate, Dadanagar, Doindaicha – 425 408, Maharashtra state, India
Telephone	91-9422286328
Email	mumbai@universalstarch.com

Organization name	Shree Ram Hotels
Contact person	Mr. B. L. Soni
Title	Director
Address	Residency Road, Jodhpur – 342 001, Rajasthan state, India
Telephone	020-2671100
Email	hotels@shreeramgum.com

Organization name	Chhabra Syncotex Ltd
Contact person	Mr. K. L. Chhabra
Title	Director
Address	Chhabra Mansion, Opp. Water Works, Pur Road, Bhilwara – 311 001, Rajasthan state, India
Telephone	91-1482-242511
Email	info@chhabragroup.in

Organization name	Sona Processors (India) Ltd.
Contact person	Mr. S. K. Surana
Title	General Manager
Address	GuwardiChittorgarh Road, P. B. No. 73, Bhilwara – 311 001, Rajasthan state, India
Telephone	91-1482-242511
Email	sonaprocess@sancharnet.in

Organization name	Delhi Rajasthan Transport Co. Ltd.
Contact person	Mr. Premesh Bhootra
Title	Director
Address	DRTC House, Behind Olympic Complex, Jodhpur – 342 001, Rajasthan state, India
Telephone	91-291-2633673
Email	jodhpur@drtcindia.com

Organization name	Metro Cement and Mines Pvt. Ltd.
Contact person	Mr. Ramesh Rathi
Title	Director

Address	Mahesh Hostel Complex, 2nd Floor, Opp. Bombay Motors, Chopasani Road, Jodhpur – 342 003, Rajasthan state, India
Telephone	91-291-2654000
Email	jodhpur@srspl.com

Organization name	Sarvodaya Suitings Ltd
Contact person	Mr. Sushil Kumar Jain
Title	Managing Director
Address	Plot No. 1-S-1 to 4, Opposite Mewar Mills, BasantVihar, Bhilwara, Rajasthan, India
Telephone	01482-223300
Email	rgbalia31@rediffmail.com

Organization name	Free India Energy Ltd
Contact person	Mr. Manish Mehta
Title	Director
Address	105, 106, 107, Prime Plaza, First Floor, J.V. Patel Compound, Balasheth Madurkar Road, Elphinstone Road, Mumbai- 400 013, Maharashtra State, India
Telephone	91-9324069080
Email	shrikantkawde@rediffmail.com

Organization name	S C Shettar and Sons
Contact person	Mr. Vijay Kumar Shettar
Title	Proprietor
Address	Hirepath, Hubli – 580 028, Karnataka state, India
Telephone	91-836-2362229
Email	scshettar@airtelmail.in

Organization name	Swarna Constructions
Contact person	Mr. Ch. V. S. V. Prasad
Title	Partner
Address	G-6, Satellite Complex, Koppikar Road, Hubli – 580 023, Karnataka state, India
Telephone	91-836-2369898
Email	chvsvp66@gmail.com

Organization name	Suresh Kumar Sharma (HUF)
Contact person	Mr. Suresh Kumar Sharma
Title	Karta

Address	Baidyanath Bhawan, Great Nag Road, Nagpur – 9, Maharashtra state, India
Telephone	91-71-26644949
Email	gopalsbab@yahoo.com

Organization name	BEML Limited
Contact person	Mr. Suresh Vastrad
Title	General Manager
Address	BEML Soudha, No. 23/1, 4th Main, S. R. Nagar, Bangalore, Karnataka state, India
Telephone	91-80-22963146
Email	cp2@beml.co.in

Organization name	M/s Balamurugan Chemicals
Contact person	Mr. Murugesan
Title	Director
Address	32/2, BMC House, Halls Road, Egmore, Chennai - 8
Telephone	91-9787100712
Email	

Roles/responsibilities for the project proponent(s):

- Review the overall performance of project.
- Preparing & submitting supporting documents for Verification of VERs.
- Management of all electricity generation data.

1.4 Other Entities Involved in the Project

Organization name	MITCON Consultancy & Engineering Services Ltd.
Role in the project	Consultant
Contact person	Mr. Deepak Zade
Title	Sr. Vice Precedent
Address	Behind DIC Office, Agri College Campus, Shivajinagar, Pune - 411 005
Telephone	09822684106
Email	deepak.zade@mitconindia.com

Role & Responsibility of MITCON:

Validation / Verification of data – Calculation of VERs based on issued credit report/JMR report and preparation of carbon credit procedural documents

1.5 Project Start Date

Project start date: 14/03/2004 (The earliest date of J - 225 in the grouped project activity based on commissioning date).

1.6 Project Crediting Period

10 years twice renewable (First Crediting Period –01/04/2006 to 31/03/2016)
(Second Crediting Period – 01/04/2016 to 31/03/2026)

1.7 Project Scale and Estimated GHG Emission Reductions or Removals

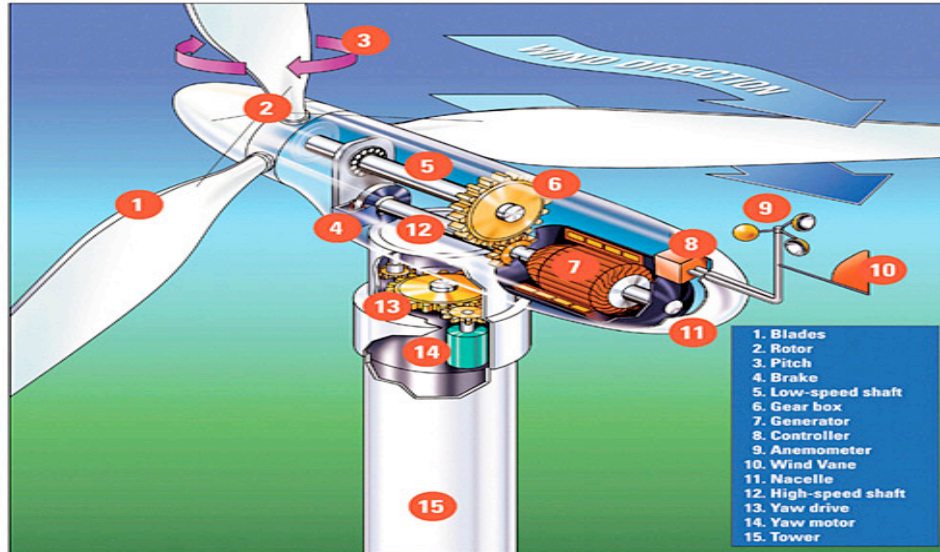
Project Scale	
Project	
Large project	X

Year	Estimated GHG emission reductions or removals (tCO ₂ e)
2016-17	140,590
2017-18	140,590
2018-19	140,590
2019-20	140,590
2020-21	140,590
2021-22	140,590
2022-23	140,590
2023-24	140,590
2024-25	140,590
2025-26	140,590
Total estimated ERs	1,405,900
Total number of crediting years	10
Average annual ERs	140,590

1.8 Description of the Project Activity

The wind turbine converts wind's kinetic energy into electricity. This project activity based on an environmentally safe technology provided by the various wind technology suppliers i.e. NEPC, Pioneer Wincon, Suzlon Ltd., NEG Micon, Gamesa Eolica. The aggregate capacity of project is 74.9 MW consisting 68.875 MW grid-connected and 6.025 MW captive renewable electricity generations. The project activity involves 72 project promoters which comprises installation of total 111 No's WTGs ranging from 0.225 to 1.5 MW.

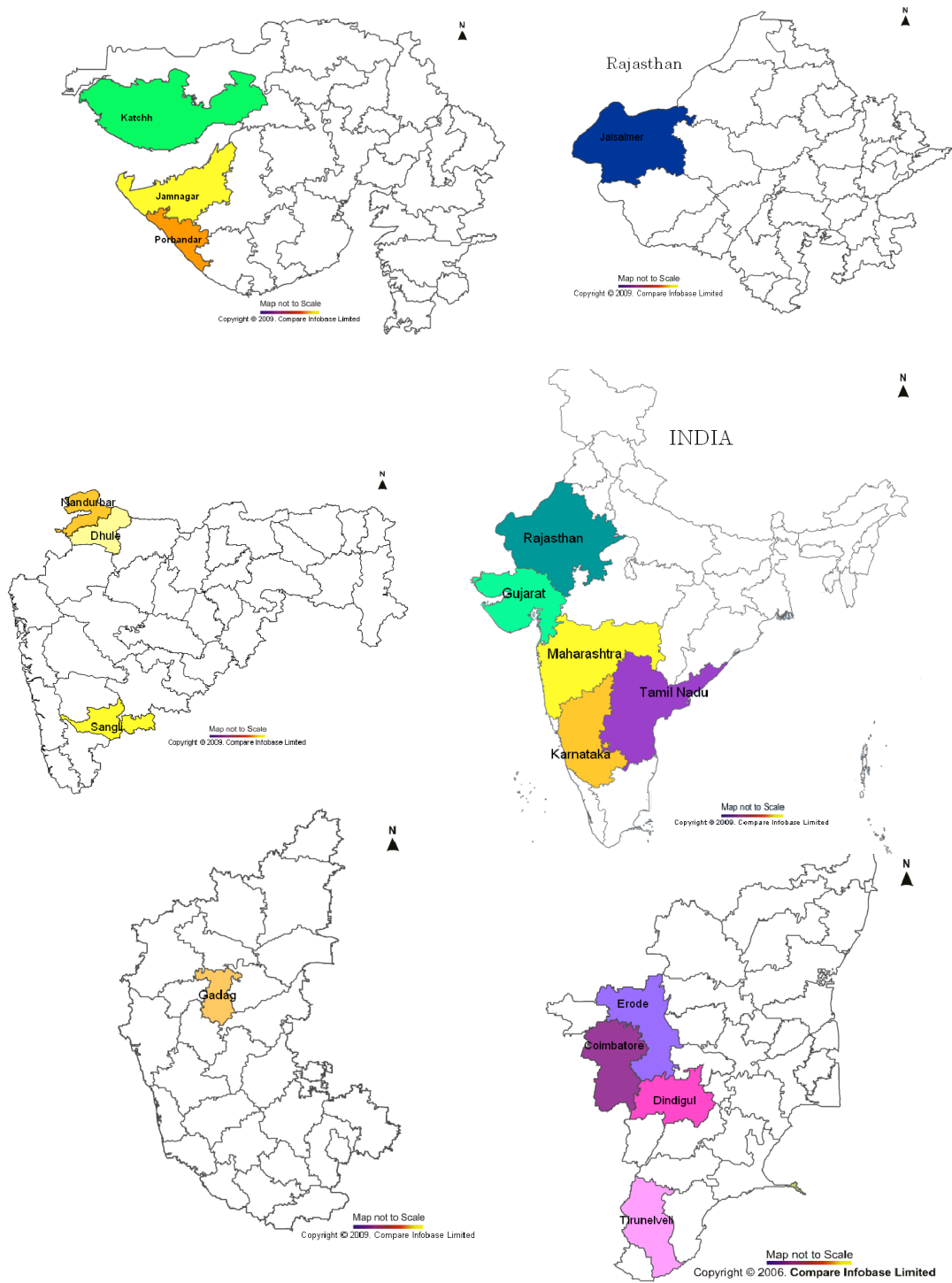
In wind energy generation, kinetic energy of wind is converted into mechanical energy and subsequently into electrical energy. Wind has considerable amount of kinetic energy when blowing at high speeds. The wind (Kinetic Energy) when it passes through the blades of the wind turbines, it is converted into mechanical energy and rotates the wind blades. When the wind blades rotate, the connected generator also rotates thereby produce electricity.



Schematic Diagram of WTG

All the above WTGs in the project have been developed indigenously and no transfer of technology is involved.

1.9 Project Location



Sr. No.	Name of Project Promoter	WTG Unique ID No.	GPS coordinates
1	Pragati Agencies	G-316	17°01'N 74°35'E
2	Umang Textiles	W-06	17°08'N 74°59'E
3	Ankur Textiles	W-19	17°08'N 74°59'E
4	Vandana Textiles	W-20	17°08'N 74°59'E
5	Sun Irrigation System (P) Ltd.	W-18	17°08'N 74°59'E
6	Jathar Textiles Pvt Ltd.	W-22	17°08'N 74°59'E
7	B. C. Chadrashekhhar	W-26	17°08'N 74°59'E
8	B.C. Shivakumar	W-52	17°08'N 74°59'E
9	Aerolex Cablenet	G-324	17°08'N 74°59'E
10	B. S. Channabasappa& Sons	G-334	17°08'N 74°59'E
11	Air Control (India) Pvt. Ltd.,	GP-99	16°46'N 73°86'E
12	Bengal Cardboard Industries & Printers Pvt. Ltd.	K-318	20°98'N 73°86'E
13	Chaphekar Engineering Pvt. Ltd.	GP-42	16°46'N 73°86'E
14	Economic Explosives Limited.	K -505	16°36'N 74°25'E
15	Jsons Founry Private Limited	GP102	17°01'N 74°35'E
16	Jsons Founry Private Limited	GP101	17°01'N 74°35'E
17	Jsons Founry Private Ltd.	GP31	17°01'N 74°35'E
18	Western Precicast Pvt Limited	K -437	21°11'N 74°13'E
19	Metal Link Alloys Limited	K -258	16°46'N 73°86'E
20	Naik Sea Foods Limited	K -308	20°98'N 74°31'E
21	RDS Construction Company	K -322	20°98'N 74°31'E
22	Silverline Investment Co. Pvt. Ltd.	K-317	20°98'N 74°31'E
23	Sushila Overseas,	W-23	17°01'N 74°31'E
24	Vostok (Fareast) Securities Pvt. Ltd.	K-309	20°98'N 74°31'E
25	Shree Ambica Auto Sales & Service	G-87	17°11' N 74°21'E
26	Unirose Textile Processors Pvt. Ltd.	W-60	16°51' N 74°35'E
27	B. S. C. Textiles	W-62	16°51' N 74°35'E
28	P. Vijaya Kumar	W-30	16°51' N 74°35'E
29	B. C. Umapathy (smaller HUF)	W-34	16°51' N 74°35'E
30	P. Mohan Lal	W-33	16°51' N 74°35'E
31	S. K. Veerbhadrappa& Co	W-04	16°51' N 74°35'E
32	SreeVeerbhadrashwara Rice & Flour Mill	W-47	16°51' N 74°35'E
33	GEM Lab. Pvt. Ltd.	K-252	20°58' N 74°19'E
34	GEM Lab. Pvt. Ltd.	J-119	20°58' N 74°19'E
35	Sri Anjaneya Cotton Mills Pvt. Ltd.	K-255	20°59' N 74°19'E
36	Sri Anjaneya Cotton Mills Pvt. Ltd.	K-261	20°59' N 74°19'E
37	Harshita Sales Corporation.	W-54	16°51' N 74°35'E
38	Ushakal Nursing Home	W-15	16°51' N 74°35'E
39	Mahabal Auto Ancillaries Pvt Ltd	G-360	16°52' N 74°34'E
40	Mahabal Metals Pvt. Ltd	K-536	21°11' N 74°13'E
41	MahalaxmiInfraprojects Limited	K-340	21°11' N 74°19'E
42	Agarwal Packaging Pvt. Ltd.	G-206	16°59' N 74°07'E
43	Agarwal Packaging Pvt. Ltd.	GP-36	16°59' N 74°07'E
44	Choudhary Exports	J-082	20°54' N 74°47'E
45	Runwal Developers Pvt. Ltd	K-06	21°11' N 74°19'E
46	Runwal Developers Pvt. Ltd	K-12	21°11' N 74°19'E
47	Kulkarni Power Tools Ltd.	J-078	21°16' N 73°56'E
48	Jsons Foundry Private Limited	1445	8°16' N 77°42'E
49	Jsons Foundry Private Limited	1445	8°16' N 77°42'E
50	Jsons Foundry Private Limited	1445	8°16' N 77°42'E
51	Jsons Foundry Private Limited	1445	8°16' N 77°42'E
52	Jsons Foundry Private Limited	1445	8°16' N 77°42'E

Sr. No.	Name of Project Promoter	WTG Unique ID No.	GPS coordinates
53	Jsons Foundry Private Limited	1445	8°16' N 77°42' E
54	Jsons Foundry Private Limited	2159	8°16' N 77°42' E
55	Western Precicast Pvt. Ltd.	2163	8°16' N 77°42' E
56	P.M.P. Textiles Spinning Mills Limited	497	11°00' N 76°96'E
57	RCR Eco-Power	1163	08°16' N 77°42'E
58	RCR Eco-Power	1163	08°16' N 77°42'E
59	RCR Eco-Power	1202	08°16' N 77°42'E
60	RCR Eco-Power	2156	08°16' N 77°42' E
61	RCR Eco-Power	2442	08°16' N 77°42' E
62	Shankarlal	2149	08°16' N 77°42' E
63	B. S. C. Textiles	1870	08°16' N 77°42' E
64	B. S. C. Textiles	1871	08°16' N 77°42' E
65	B. S. C. Textiles	2116	08°16' N 77°42' E
66	P. Vijaya Kumar	1904	08°16' N 77°42' E
67	P. Vijaya Kumar	1496	08°16' N 77°42' E
68	O. B. Agarwal	2147	08°16' N 77°42' E
69	Radha-Mohan Processors	1872	08°16' N 77°42' E
70	Swadeshi Dyeing & Bleaching Mills Private Limited	1875	08°16' N 77°42' E
71	B. S. Channabasappa& Sons	1874	08°16' N 77°42' E
72	B. S. Channabasappa& Sons	1873	08°16' N 77°42' E
73	B. S. Channabasappa& Sons	2117	08°16' N 77°42' E
74	P. Mohan Lal	1740	08°16' N 77°42' E
75	P. Mohan Lal	1505	08°16' N 77°42' E
76	Operational Energy group India (P) Pvt Ltd	1242	08°16' N 77°42'E
77	Operational Energy group India (P) Pvt Ltd	1242	08°16' N 77°42'E
78	Mahalingashetty& Co. Ltd.	D 62	10°21' N 77°57' E
79	Sri Venkatachalapathy Spinning Mills Pvt. Ltd.	1602	08° 44' N 77°42'E
80	Sri Venkatachalapathy Spinning Mills Pvt. Ltd.	16093	08° 44' N 77°42'E
81	Choudhary Exports	1191	11° 21' N 77°44'E
82	Ramraj Handlooms	1176	08°10' N 77°34' E
83	Ramraj Handlooms	1057	09°48' N 77°19' E
84	Ramraj Handlooms	1961	08°18' N 77°27' E
85	N. Sumati	401	10°58' N 77°17' E
86	K. R. Nagarajan	400	10°58' N 77°17' E
87	Air Control (India) Pvt. Ltd.,	SEL/600/07-08/0906	21°63' N 69°06'E
88	Badawe Engineers Pvt. Ltd.	SEL/600/07-08/0922	21°63' N 69°6' E
89	Pragati Glass Pvt. Ltd.,	SEL/1250/06-07/0237	22°46'N 70°06'E
90	Siddharth Infra Tech Pvt. Ltd (Siddharth Construction)	SEL/600/07-08/0904	21°63' N 69°60' E
91	Agarwal Enterprises	SEL/600/07-08/0979	21°38' N 69°36' E
92	Agarwal Enterprises	SEL/600/07-08/0980	21°38' N 69°36' E
93	Unique Sugars Ltd.	SEL/1500/06-07/0441	23°11' N 68°54' E
94	Jaychandra Agro Industries Pvt. Ltd.	SEL/600/06-07/0443	23°11' N 68°59'E
95	Shree Ram Hotels	J-363	26°55' N 70°39'E
96	ChhabraSyncotex Ltd	J-414	26°53' N 71°00'E

Sr. No.	Name of Project Promoter	WTG Unique ID No.	GPS coordinates
97	ChhabraSyncotex Ltd.	J-166	26°55' N 70°51'E
98	ChhabraSyncotex Ltd.	J-367	26°55' N 70°39'E
99	Sona Processors (India) Ltd.	J-370	26°55' N 70°39'E
100	Delhi Rajasthan Transport Co. Ltd.	J-141	26°55' N 70°51'E
101	Metro Cement and Mines Pvt. Ltd.	J-160	26°55' N 70°51'E
102	SarvodayaSutings Ltd	J-49	26°91' N 70°90'E
103	SarvodayaSutings Ltd	J-43	26°91' N 70°90'E
104	Free India Energy Ltd	J225	22°28' N 70°04'E
105	S C Shettar and Sons	K-303	15°12' N 75°53'E
106	Swarna Constructions	K-304	15°12' N 75°53'E
107	Suresh Kumar Sharma (HUF)	K-229	15°25' N 75°38'E
108	BEML Limited	K-317	15°25' N 75°38'E
109	BEML Limited	K-318	15°25' N 75°38'E
110	BEML Limited	K-319	15°25' N 75°38'E
111	BEML Limited	K-320	15°25' N 75°38'E

1.10 Conditions Prior to Project Initiation

The project sites [in Maharashtra (Sangli, Nandurbar, Dhule), Gujarat (Jamnagar, Porbandar, Katchh), Rajasthan (Jaisalmer), Tamilnadu (Dindigul, Coimbatore, Erode, Tirunelveli) Karnataka (Gadag)] prior to initiation of project activity were (i) undeveloped, hilly terrain without obstacles such as tall building or trees and is elevated above surrounding terrain (ii) without road network connectivity (iii) poor soil quality (iv) partial agricultural, grass & shrubs, cattle grazing (v) low technical wages employment in the area and (vi) low commercial market value for land & property. This project activity is new initiative at the wind sites.

1.11 Compliance with Laws, Statutes and Other Regulatory Frameworks

The Project activity meets all local laws and regulation of India. Each Wind Electric Generator included in the grouped project activity has a construction permit, all necessary NOCs (commissioning certificate, land document, PPA etc.). The supportive copies of the same have been provided to DOE.

1.12 Ownership and Other Programs

1.12.1 Project Ownership

The ownership of each WTG to the project proponent can be verified through following documents from the government-authorised bodies for each WTG.

- Commissioning Certificate
- Power Purchase Agreement
- Energy generation statement issued by state electricity board
- Invoices

1.12.2 Emissions Trading Programs and Other Binding Limits

The letter of undertaking has been furnished by the project participant which confirms that the net GHG emission reductions or removals generated by the project activity will not be used for compliance with an emission trading program or to meet binding limits on GHG emissions.

1.12.3 Other Forms of Environmental Credit

The letter of undertaking has been furnished by the project participant, which confirms that the project neither has nor intends to generate any other form of GHG-related environmental credit from GHG emission reductions or removals claimed under the VCS program, or that any such credit has been or will be cancelled from the relevant program.

1.12.4 Participation under Other GHG Programs

The project is registered only under VCS project activity
Project ID : 429² (as per VCS database)

1.12.5 Projects Rejected by Other GHG Programs

The project has not rejected by any other GHG program

1.13 Additional Information Relevant to the Project

Eligibility Criteria

As project activity is not grouped project activity, the eligibility criteria is not applicable

Leakage Management

Not Applicable

Commercially Sensitive Information

Not Applicable

Sustainable Development

Contribution of project activity to sustainable development

Government of India has stipulated following indicators for sustainable development in the interim approval guidelines¹ for CDM projects. The same is applied for the VCS project.

1. Social well-being
2. Economic well-being
3. Environmental well-being
4. Technological well-being

1. Social well-being

- The project site(s) in India are almost situated in an isolated rural area where unemployment, poverty and other economic hardships are prevalent. Slow initiation of new investment in the region is attributed to lack of supportive infrastructure, which can favour private investment.

² http://www.vcsprojectdatabase.org/#!/project_details/429

These projects will therefore, lead to the development of this region(s) through opening up of opportunities for income generation.

- During civil work, the project is expected to generate considerable employment opportunities for the local population on wind farms.
- Other than these, there are various kinds of mechanical work, which will generate employment opportunity on regular and permanent basis.

2. Economic well-being

- The project activity will generate employment in the local area. The installation of wind turbines generates direct (at site) and indirect (off site) employment. It is estimated that job created to 5.7 personnel directly and 22.87 personnel indirectly per MW adding up to a total of 28.6 jobs per MW installed capacity. The jobs in occupational category includes professional technical and managerial, clerical and sales, service, processing machinery trades, bench work, structural work miscellaneous³
- The project activity will lead to good investment to a developing region which otherwise would not have happened in the absence of project activity.
- The generated electricity will be fed into the Indian grids, thereby improving the grid frequency and availability of electricity to the local consumers (villagers & sub-urban habitants). This will provide new opportunities for industries and economic activities to be setup in the area thereby resulting in greater local employment, ultimately leading to overall development.
- The project activity will also lead to diversification of the national energy supply, which is dominated by conventional fuel based generating units.

3. Environmental well-being

- The project utilizes wind energy for generating electricity which otherwise would have been generated through alternate fuels (most likely fossil fuel) based power plants, contributing to reduction in associated specific emissions including GHG emissions.
- Wind power projects produce no end products in the form of waste (like Particulate Matter, Fly ash, Water effluent etc.).
- Being a renewable resource, using wind energy to generate electricity contributes to resource conservation. Thus, the project causes no negative impact on the surrounding environment contributing to environmental well being.

4. Technological well-being

- There is continuous research and development on the geometry of the wind blades, height of towers, diameters of towers, etc., which augur well for the technological well being in the development of wind energy to produce clean electricity.
- Advancement in wind power production encourages research on improved performance of turbines at low to medium wind speeds and improved capacity utilisation, cost reduction and high reliability, and increased life of turbines.

³ *Green Energy*, vol 2, no. 4, July-August 2006

- Suzlon, NEPC, Pioneer Wincon, Gamesa Eolica and NEG Micon manufactured the WEG(S) installed by project promoters. This will create a technological promotion in undeveloped area. In view of the above, the project promoter considered this project activity profoundly contributes to the sustainable development.

Further Information

Not Applicable

2 APPLICATION OF METHODOLOGY

2.1 Title and Reference of Methodology

Title: ACM0002 - "Consolidated methodology - grid-connected electricity generation from renewable sources"⁴ (Version 17.0)

The methodology refers to ACM 0002 to the latest approved version of following tools-

"Tool for the demonstration and assessment of additionality" version 07

"Tool to calculate the emission factor for an electricity system" version 06

"Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period" version 3.0.1

2.2 Applicability of Methodology

The project activity is a bundled wind power project of total installed capacity of 73.10 MW hence "Consolidated baseline methodology for grid connected electricity generation from renewable sources" ACM0002 is applicable for this project. The project activity is a installation of a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity. (Greenfield Power Plant)

The methodology is applicable under the following conditions

This methodology is applicable to grid-connected renewable energy power generation project activities that: (a) Install a Greenfield power plant; (a) Involve a capacity addition to (an) existing plant(s); (b) Involve a retrofit of (an) existing operating plants/units; (c) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (d) Involve a replacement of (an) existing plant(s)/unit(s).	The project activity is a renewable energy project i.e. wind power project which falls under applicability criteria option (a) "Install a greenfield power plant" The project activity is the installation of a wind power plant of total capacity 74.9 MW. Hence project activity meets the applicability criterion.
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http://cdm.unfccc.int/filestorage/D/5/Y/D5YFS9I3VKBT18MQNGX0LPZ6U7AWCO/ACM0002_%28v17%200%29_cle an.pdf?t=UDh8b3NxMHZtfDAPhRwsU1xEvbdze5pRrk2A

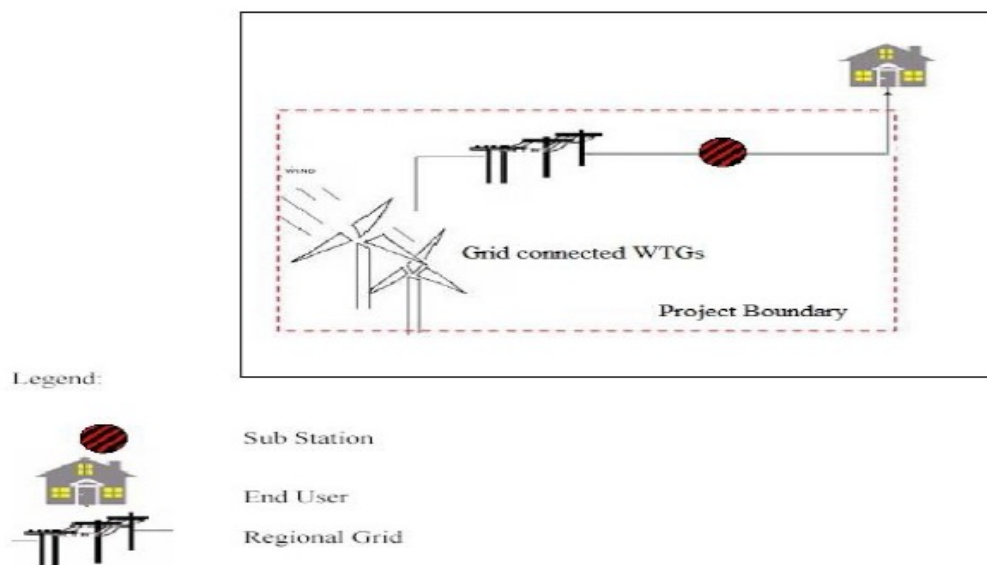
The methodology is applicable under the following conditions: (a) The project activity may include renewable energy power plant/unit of one of the following types: hydro power plant/unit with or without reservoir, wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit; (b) In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power capacity addition projects the existing plant/unit started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.	The option (a) of the applicability criteria is applicable as project is renewable energy wind power plant/unit.
In case of hydro power plants, one of the following conditions shall apply: (a) The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or (b) The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density calculated using equation (3), is greater than 4 W/m²; or (c) The project activity results in new single or multiple reservoirs and the power density, calculated using equation (3), is greater than 4 W/m²; or (d) The project activity is an integrated hydro power project involving multiple reservoirs, where the power density for any of the reservoirs, calculated using equation (3), is lower than or equal to 4 W/m², all of the following conditions shall apply: (i) The power density calculated using the total installed capacity of the integrated project, as per equation (4), is greater than 4 W/m²; (ii) Water flow between reservoirs is not used by any other hydropower unit which is not a part	The project activity is new installation of wind power plant hence, this condition is not applicable.

of the project activity; (iii) Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m² shall be: a. Lower than or equal to 15 MW; and b. Less than 10 per cent of the total installed capacity of integrated hydro power project.	
In the case of integrated hydro power projects, project proponent shall:	The project activity is new installation of wind power plant hence, this condition is not applicable.
Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or	The project activity is new installation of wind power plant hence, this condition is not applicable.
Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum five years prior to implementation of CDM project activity.	The project activity is new installation of wind power plant hence, this condition is not applicable.
The methodology is not applicable to: (a) Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; (b) Biomass fired power plants/units.	The project activity is new installation of wind power plant hence, this condition is not applicable.
In the case of retrofits, rehabilitations, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is "the continuation of the current situation, that is to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance".	The project activity is new installation of wind power plant hence, this condition is not applicable.
In addition, the applicability conditions included in the tools referred to below apply	Please refer below table

“Tool to calculate the emission factor for an electricity system” Annex 7, EB 97 (Version 6.0)

This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).	The project is a grid connected Greenfield Wind power project and thus the tool is applicable.
Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants. In the latter case, two sub-options under the step 2 of the tool are available to the project participants, i.e. option IIa and option IIb. If option IIa is chosen, the conditions specified in “Appendix 2: Procedures related to off-grid power generation” should be met. Namely, the total capacity of off-grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity.	Steps involved in calculation of Emission Factor is included in section 3.1 of the VCS PD as per the requirement of the tool
In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	Project is located in non-Annex I country and hence the tool is applicable
Under this tool, the value applied to the CO₂ emission factor of biofuels is zero.	The project is a Wind Power Project and there is no involvement of biofuels.

2.3 Project Boundary



Source		Gas	Included?	Justification/Explanation
Baseline	CO ₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity	CO ₂	Included	Main emission source
		CH ₄	Excluded	Excluded for simplification. This is conservative
		N ₂ O	Excluded	Excluded for simplification. This is conservative
		Other	Excluded	Not required for the project
Project	For dry or flash steam geothermal power plants, emissions of CH ₄ and CO ₂ from non-condensable gases contained in geothermal steam	CO ₂	Excluded	Not required for the project
		CH ₄	Excluded	Not required for the project
		N ₂ O	Excluded	Not required for the project
		Other	Excluded	Not required for the project
	CO ₂ emissions from combustion of fossil fuels for electricity generation in solar thermal power plants and geothermal power plants	CO ₂	Excluded	Not required for the project
		CH ₄	Excluded	Not required for the project
		N ₂ O	Excluded	Not required for the project
		Other	Excluded	Not required for the project
	For hydro power plants, emissions of CH ₄ from the reservoir	CO ₂	Excluded	Not required for the project
		CH ₄	Excluded	Not required for the project
		N ₂ O	Excluded	Not required for the project
		Other	Excluded	Not required for the project

2.4 Baseline Scenario

As per "Consolidated baseline methodology for the grid connected electricity generation from renewable sources" (version 17) classifies project activities as follows

If the project activity is the installation of a Greenfield power plant, the baseline scenario is:

Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system”.

The baseline emission factor $EF_{\text{grid,CM,y}}$ is calculated as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the “Tool to calculate the emission factor for an electricity System”

According to item 3.8.5 of the VCS Standard, version 3.7, The validity of the original baseline scenario shall be assessed. Such assessment shall include an evaluation of the impact of new relevant national and/or sectoral policies and circumstances on the validity of the baseline scenario.

According to ACM0002 methodology, if the project activity is the installation of a Greenfield power plant, the baseline scenario is electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system”.

The baseline scenario is the same as the previous baseline scenario identified in the first crediting period. There is no relevant national and/or sectoral policy and circumstances that affect the baseline scenario.

Besides that, the VCS Standard indicates that “where it is determined that the original baseline scenario is still valid, the GHG emissions associated with the original baseline scenario shall be reassessed using the latest version of the CDM Tool to assess the validity of the original/ current baseline and to update the baseline at the renewal of a crediting period.”

Steps of the CDM Methodological Tool – “Assessment of the Validity of the Original/current baseline and update of the baseline at the renewal of the crediting period”, version 03.0.1

Step 1: Assess the validity of the current baseline for the next crediting period The validity of the current baseline is assessed using the following Sub-steps:

Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies.

There is no legal and regulatory requirement that mandates the production of energy by the chosen technology. Investment in wind energy projects in the Indian electricity grid is not mandatory. There are no national or local laws or regulations that require this investment to be undertaken, i.e., setting up of wind power projects. The setting up of wind energy projects is a voluntary activity. Hence the baseline for the project activity remains unchanged in the crediting period.

Step 1.2: Assess the impact of circumstances

As per the methodology ACM0002, version 17.0.0, the alternative for the project activity is generation of equivalent amount of electricity by operation of grid-connected power plants and by addition of new generation sources. The alternative scenario for the project activity remains same and the grid still supplies primarily fossil fuel based electricity as reflected in the combined margin emission factor. Hence, circumstances and the externalities for determining the baseline for the project activity are same.

Therefore, there is no change in baseline scenario.

Step 1.3: Assess whether the continuation of the use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested

This sub-step has to be applied if the baseline scenario identified at the validation of the project activity was the continuation of use of the current equipment(s) without any investment. Since this is not the case with the project activity under consideration, hence this condition is not applicable.

Step 1.4: Assessment of the validity of the data and parameters

This step stipulates that “Where emission factors, values or emission benchmarks are used and determined only once for the crediting period, they should be updated, except if the emission factors, values or emission benchmarks are based on the historical situation at the site of the project activity prior to the implementation of the project and cannot be updated because the historical situation does not exist anymore as a result of the VCS project activity.”

In the context of the present project activity the emission factor has been updated along with the approach used to calculate the emission factor.

Step 2: Update the current baseline and the data and parameters

As evident from the explanation provided above the baseline scenario remains unchanged. Only the baseline emission factor has been updated as per the latest version of CEA database 12.0 available at the time of PD submission for renewal of crediting period..

The approved consolidated baseline methodology, ACM0002. (Version 17.0), has been used to determine the baseline and the estimation of emission reductions for the applicable crediting period. As referred in the methodology “Tool to calculate the emission factor for an electricity system” (version 06.0) has been used to determine continued validity of the baseline based on combined margin (CM) calculations.

The details of CM Emission Factor calculation are reported under the section 3.1 of this report. The values of the parameters are also reported under the section 4.1

2.5 Additionality

Regulatory Surplus:

As project activity is purely voluntary initiative of all PP. It is a business decision of the PP. The project is not in any way mandated by any law, statute or other regulatory framework. Neither is it the outcome of any systematically enforced law, statute or regulatory framework or policy that was implemented

- a) Since 11th November 2001 to provide a comparative advantage to less emission intensive technologies or activities (E minus policies) or,
- b) Since 11th December 1997 to provide a comparative advantage to more emission intensive technologies or activities

There are no criteria to be met by the project in the form of regulatory surplus.

The project activity uses the UNFCCC methodological tool ‘Tool for the demonstration and assessment of additionality’ version 7.0 to prove the additionality.

Step 0: Demonstration whether the proposed project activity is the first-of its-kind

The proposed project activity is not the first of its kind. Hence, this step is not applicable.

Step 1: Identification of alternatives to the project activity consistent with current laws and regulations

Sub-step 1a: Define alternatives to the project activity

The two realistic and credible alternatives for the project activity are:

1. Implementation of the project activity without the VCS benefits.

The wind generated electricity would be exported to the state electricity grid under a power purchase agreement thereby displacing equivalent units of power generated by fossil fuel based plants in the grid. There would be no emissions of greenhouse gases to atmosphere. This

alternative is in compliance with all applicable legal and regulatory requirements and may be a part of the baseline scenario. However there exist barriers to the implementation of the proposed project activity without VCU as explained in step 2 and step 3 below.

2. Continuation of the present scenario

The “no project option”, which is the continuance of the present scenario wherein the equivalent amount of energy would have been produced by the project grid electricity system through its currently running power plants (scenario) and by new capacity additions mostly fossil fuel operate (ie. business as usual) producing CO₂ emissions to atmosphere, is the most plausible alternative as baseline option for the project.

Sub-step 1b: Consistency with mandatory laws and regulations

All the above alternatives are in compliance with all applicable legal and regulatory requirements as follows:

The implementation of project activity is a voluntary initiative taken by some project promoters and it is not mandatory or a legal requirement. For power generation, the Electricity Act 2003 published by Ministry of Power, Government of India does not restrict or empower any authority to restrict the fuel choice, the applicable environmental regulations do not restrict the use of wind energy and there is no legal requirement on the choice of a particular technology. Thus, considering that all the alternatives are in line with the applicable legal and regulatory requirements, the “no project option” i.e. continuation of current practice where in the equivalent amount of energy would have been produced by the project grid electricity system through its currently running power plants and by new capacity additions is the chosen baseline scenario which would have happened in the absence of the proposed project activity.

Step 2: Investment analysis

Sub-step 2a: Determine appropriate analysis method

As the project generates income other than the VCU benefits (revenues from the sale of electricity to the grid), Option I that is the Simple Cost Analysis cannot be applied in this case. Among the two options – Comparison analysis (Option II) and Benchmark analysis (Option III) - the benchmark analysis has been applied for investment analysis.

Sub-step 2b – Option III. Apply benchmark analysis

The project proponent has used post tax project IRR as a financial indicator for financial analysis and additionality justification. The benchmark for the project activity is calculated based on para 6 b of Sub-step 2b – Option III i.e. Benchmark Analysis of additionality tool 5.2.

- (b) Estimates of the cost of financing and required return on capital (e.g. commercial lending rates and guarantees required for the country and the type of project activity concerned), based on bankers views and private equity investors/funds' required return on comparable projects;

The project activity involves both equity and debt component. Hence the cost of financing has been derived based upon weighted average of the cost of debt and equity component as determined for the project activity.

A. Cost of Equity:

The cost of equity has been determined based upon the Capital Asset Pricing Model (CAPM)⁵.

CAPM: The Capital Asset Pricing Model (CAPM) is used to determine a theoretically appropriate required rate of return of an asset. The model takes into account the asset's sensitivity to non-diversifiable risk (also known as market risk), often represented by the quantity beta (β) in the financial industry, as well as the expected return of the market and the expected return of a theoretical risk-free asset.

The underlying algorithm of CAPM is as follows:

$$r = R_f + \text{Beta} (R_m - R_f)$$

Where,

- r = Expected return from a security
- R_f = Rate of a risk free investment
- R_m = Expected market return
- Beta = Indicator towards measuring the volatility of the security, relative to the asset class.

It is apparent from the above equation that the expected return from a security is the return of a risk-free investment plus Beta times the difference between the expected market return and the return from the risk-free investment (termed as market risk premium). Hence CAPM justifies that the expected return of an investor should be commensurate with the higher expected risk of the investment.

In words, the algorithm says

Expected Return from a security = Risk free return + Market risk Premium * Beta

Thus, in order to apply CAPM, the following estimates are required

- Risk Free rate
- Market Risk Premium
- Beta

Risk Free Rate

R_f (Risk Free Return): The risk free return on a security that is free from default risk and is uncorrelated with returns from anything else in the economy. PP has used the rate on long term government bond that has a maturity of 20 years, as the life of the wind turbine is 20 years⁶.

R_m (Market Return): PP has calculated Market Return on the basis of return of BSE-500.

Suitability of BSE- 500: BSE-500 index consist 500 scripts. The changing pattern of the economy and that of the market were kept in mind while constructing this index. BSE-500 index represents nearly 93% of the total market capitalization on BSE. BSE-500 covers all 20 major industries of the economy.

Beta: β (Beta): Risk is an important consideration in holding any portfolio. The risk in holding securities is generally associated with the possibility that realised returns will be less than the returns expected. Risks can be classified as Systematic risks and Unsystematic risks.

⁵ Ref.: page No. 312, The CAPM Aproch, equation (9-3) of Financial Management and practice (Theory and Practice, 11th addition) by Eugene F. Brigham and Michael C. Ehrhardt, published by Thomson South-Western.

⁶ http://mnre.gov.in/file-manager/UserFiles/faq_wind.pdf

- **Unsystematic risks:** These are risks that are unique to a firm or industry. Factors such as management capability, consumer preferences, labour, etc. contribute to unsystematic risks. Unsystematic risks are controllable by nature and can be considerably reduced by sufficiently diversifying one's portfolio.
- **Systematic risks:** These are risks associated with the economic, political, sociological and other macro-level changes. They affect the entire market as a whole and cannot be controlled or eliminated merely by diversifying one's portfolio.

The degree, to which different portfolios are affected by these systematic risks as compared to the effect on the market as a whole, is different and is measured by Beta. To put it differently, the systematic risks of various securities differ due to their relationships with the market. The Beta factor describes the movement in a stock's or a portfolio's returns in relation to that of the market return. For all practical purposes, the market returns are measured by the returns on the index, since the index is a good reflector of the market.

Calculation of Beta: The PP has created portfolio of three power generating companies i.e. Tata Power, Reliance Energy and Gujarat Industries. The return of these three companies are compared against the returns of BSE – 500 (As the BSE-500 index represents nearly 93% of the total market capitalization on BSE). The beta is calculated by applying following formula over returns of BSE-500 and portfolio created by the PP or power index.

The following companies were the listed power generation companies with a trading history of atleast one year as on 31/12/2003:

BF Utilities Ltd,

- CESC Ltd,
- Gujarat Industries Power Co Ltd
- Neyveli Lignite Corporation Ltd
- Reliance Infrastructure Ltd and
- Tata Power

Out of the above PP has selected TATA power, Reliance energy and Gujarat Industries (as theses are the oldest companies in power generation in India). On 3rd January 2005 Bombay Stock Exchange launched its own Power Index, hence for the benchmark calculation of 31/03/2006 onwards PP has used the Power Index. The power index included the following companies:

Script Code	Name of Company (Ref: http://www.moneycontrol.com/news/market-news/bselaunches-bse-power-index14-stocks_312363.html)
500103	Bharat Heavy Electricals Ltd
532555	NTPC Ltd
500390	Reliance Energy Ltd.
532667	Suzlon Energy Ltd
500400	Tata Power Co. Ltd
500002	ABB Ltd
500550	Siemens Ltd.
500093	Crompton Greaves Ltd.
532898	Power Grid Corporation Of India Ltd.
532708	GVK Power & Infrastructure Ltd.
532754	GMR Infrastructure Ltd.
532779	Torrent Power Ltd.
522275	Areva T&D India Ltd.

500084	CESC Ltd.
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After launch of power index following companies were replaced from it till date (Ref.: <http://www.bseindia.com/about/abindices/SectoralIndices.asp>)

Date	Scripts Excluded	Scripts Included
29.02.2008		Reliance Power Ltd.
28.07.2008	Areva T & D India Ltd.	Lanco Infratech Ltd.
	CESC Ltd.	Neyveli Lignite Corporation Ltd.

For calculation of Beta following formula is used: $\text{Beta} = \text{COVAR}(\text{return of BSE- 500}, \text{return of Portfolio}) / \text{VAR}(\text{return of BSE-500})$

Based on the above method PP has calculated Cost of Equity for different period:

Particular	Basis	31-12-03	31-12-03	31/03/06	31/03/07	31/03/08
Risk Free Return	www.rbi.org	5.82%	6.96%	7.41%	7.69%	8.09%
Market Return	Calculation sheet is attached	19.15%	17.72%	23.42%	21.65%	21.93%
Beta		1.02	1.24	0.97	0.89	1.15
Expected Rate of Return		19.45%	20.28%	22.99%	20.15%	23.99%

Thus it is evident that the project proponent has computed market risk premium based on the given guidance from UNFCCC and local financial system. The overall risk premium depends both on beta value and the market risk premium.

B. Cost of Debt:

The cost of debt has been ascertained from the Benchmark Prime Lending Rate (BPLR) suggested by the Reserve Bank of India. The BPLR suggested by the RBI is a lending rate, on the basis of which all the nationalized Banks decides there BPLR. BPLR of the Bank is the rate at which the bank lends to prime borrowers. The PP's has considered the BPLR band for cost of debt (Range of BPLR) suggested by the RBI as on different dates, under assumption that the range will be the most probable rate of interest for the project. The BPLR as on different dates are as under:

Year	BPLR	Reference
Dec-03	11.00%	http://rbi.org.in/scripts/AnnualReportPublications.aspx?id=439
Mar-05	10.75%	http://rbi.org.in/scripts/AnnualReportPublications.aspx?id=657
Mar-06	10.75%	http://rbi.org.in/scripts/AnnualReportPublications.aspx?id=657
Mar-07	12.50%	http://rbi.org.in/scripts/AnnualReportPublications.aspx?id=864
Mar-08	12.75%	http://rbi.org.in/scripts/AnnualReportPublications.aspx?id=864

The post tax cost of debt has been calculated by multiplying the pre-tax cost of debt with (1-effective tax rate). Minimum Alternative Tax is considered as effective tax rate.

Year	BPLR	Effective Tax Rate (MAT)	Post tax Cost of Debt Pre tax Cost of debt * (1 – effective tax rate)
Dec-03	11.00%	7.69%	10.15%
Mar-05	10.75%	7.84%	9.91%
Mar-06	10.75%	7.84%	9.84%
Mar-07	12.50%	11.22%	11.10%

Mar-08	12.75%	11.22%	11.31%
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[Source: i) Dec03, Mar05- TAXMANN'S "Direct Taxes Ready Reckoner" book by Dr. Vinod K. Singhanian & Jeevan Singhanian 2005-06, Page no. 15

ii) March06, Mar07- <http://www.uja.in/FAQ/tabid/145/Default.aspx> MAT rate applicable during assessment year 2006-07, 2007-08.

iii) Mar08 - Source: TAXMANN'S "Direct Taxes Ready Reckoner" book by Dr. Vinod K. Singhanian & Jeevan Singhanian 2008-09 & 2009-10, 31st Edition Page no. 15

1. Calculation of Benchmark: WACC for different period is calculated as under:

Year	Post tax Cost of Debt	Proportion of Debt	Cost of Equity	Proportion of Equity	Weighted Average Cost of Capital
Dec-03	10.15%	70%	19.45%	30%	12.94%
Mar-05	9.91%	70%	20.28%	30%	13.02%
Mar-06	9.84%	70%	22.99%	30%	13.79%
Mar-07	11.10%	70%	20.15%	30%	13.81%
Mar-08	11.31%	70%	23.99%	30%	15.11%

The investment analysis for the project activity is carried out by calculating the Project IRR as the appropriate financial indicator. The Project IRR without VCU is as under:

Sr. No.	Name of Project Promoter	Installed Capacity	Benchmark	Project IRR
Maharashtra				
1	Pragati Agencies	1.25	13.02	7.09
2	Umang Textiles	0.60	13.79	4.97
3	Ankur Textiles	0.60	13.02	4.4
4	Vandana Textiles	0.60	13.02	4.39
5	Sun Irrigation System (P) Ltd.	0.60	13.02	5.49
6	Jathar Textiles Pvt. Ltd.	0.60	13.02	5.07
7	B. C. Chadrashekhar	0.60	13.79	6.38
8	B.C. Shivakumar	0.60	13.79	6.3
9	Aerolex Cablenet	1.25	13.02	8.11
10	B. S. Channabasappa & Sons	1.25	13.02	8.6
11	Air Control (India) Pvt. Ltd.	0.60	13.81	3.63
12	Bengal Cardboard Industries & Printers Pvt. Ltd.	0.60	13.79	4.84
13	Chaphekar Engineering Pvt. Ltd.	0.60	13.79	4.67
14	Economic Explosives Limited	1.25	13.02	6.78
15	Jsons Foundry Private Limited	0.60	15.07	5.62
16	Jsons Foundry Private Limited	0.60	15.07	5.62
17	Jsons Foundry Private Limited	0.60	13.79	5.12
18	Western Precicast Pvt Ltd	1.25	13.02	8.23
19	Metal Link Alloys Ltd.	1.25	13.79	9.72
20	Naik Sea Foods Ltd.	0.60	13.79	5.24
21	RDS Construction Company	0.60	13.79	5.24
22	Silverline Investment Co. Pvt. Ltd.	0.60	13.79	4.83
23	Sushila Overseas	0.60	13.79	7.19
24	Vostok (Fareast) Securities Pvt. Ltd.	0.60	13.79	4.59
25	Shree Ambica Auto Sales & Service	1.25	13.79	9.62
26	Unirose Textile Processors Pvt. Ltd.	0.60	13.79	5.58
27	B. S. C. Textiles	0.60	13.79	5.98
28	P. Vijaya Kumar	0.60	13.79	5.2

Sr. No.	Name of Project Promoter	Installed Capacity	Benchmark	Project IRR
29	B. C. Umapathy (smaller HUF)	0.60	13.79	6.32
30	P. Mohan Lal	0.60	13.79	5.25
31	S. K. Veerbhadrappa & Co	0.60	13.79	5.21
32	Sree Veerbhadreshwara Rice & Flour Mill	0.60	13.79	5.34
33	GEM Lab. Pvt. Ltd.	1.25	13.79	9.27
34	GEM Lab. Pvt. Ltd.	1.25	13.79	9.27
35	Sri Anjaneya Cotton Mills Pvt. Ltd.	1.25	13.02	7.73
36	Sri Anjaneya Cotton Mills Pvt. Ltd.	1.25	13.02	7.73
37	Harshita Sales Corporation	0.60	13.79	7.74
38	Ushahkal Nursing Home	0.60	13.81	5.27
39	Mahabal Auto Ancillaries Pvt. Ltd	1.25	13.02	8.18
40	Mahabal Metals Pvt. Ltd	1.25	13.79	7.93
41	Mahalaxmi Infraprojects Limited	1.50	13.79	5.27
42	Agarwal Packaging Pvt. Ltd.	1.25	13.02	10.18
43	Agarwal Packaging Pvt. Ltd.	0.60	13.79	5.07
44	Choudhary Exports	1.25	13.79	8.41
45	Runwal Developers Pvt. Ltd.	1.25	12.94	10.56
46	Runwal Developers Pvt. Ltd.	1.25	12.94	7.97
47	Kulkarni Power Tools Ltd.	1.25	13.79	8.65
Tamilnadu				
48	Jsons Fountry Private Ltd.	0.225	13.79	7.64
49	Jsons Fountry Private Ltd	0.225	13.79	7.64
50	Jsons Fountry Private Ltd	0.225	13.79	7.64
51	Jsons Fountry Private Ltd	0.225	13.02	6.61
52	Jsons Fountry Private Ltd	0.225	13.02	6.61
53	Jsons Fountry Private Ltd	0.225	13.02	6.61
54	Jsons Fountry Private Ltd	0.225	13.02	6.61
55	Western Precicast Pvt. Ltd.	0.225	13.79	7.77
56	P.M.P. Textiles Spinning Mills Limited	0.50	12.94	10.28
57	RCR Eco-Power	0.225	12.94	7.82
58	RCR Eco-Power	0.225	12.94	7.82
59	RCR Eco-Power	0.35	13.02	5.39
60	RCR Eco-Power	0.35	13.79	5.67
61	RCR Eco-Power	0.60	13.81	6.44
62	Shankarlal	0.225	13.79	9.04
63	B. S. C. Textiles	0.225	13.02	9.9
64	B. S. C. Textiles	0.225	13.02	9.9
65	B. S. C. Textiles	0.225	13.79	11.64
66	P. Vijaya Kumar	0.225	13.79	10.42
67	P. Vijaya Kumar	0.225	13.02	9.63
68	O. B. Agarwal	0.225	13.79	13.79
69	Radha-Mohan Processors	0.225	13.02	8.58
70	Swadeshi Dyeing & Bleaching Mills Private. Limited	0.225	13.02	8.85
71	B. S. Channabasappa & Sons	0.225	13.02	9.9
72	B. S. Channabasappa & Sons	0.225	13.02	9.9
73	B. S. Channabasappa & Sons	0.225	13.79	11.55
74	P. Mohan Lal	0.225	13.02	8.61
75	P. Mohan Lal	0.225	13.02	9.63
76	Operational Energy group India (P) Pvt Ltd (Previously: Dr. Santosh Prabhu)	0.225	12.94	8.29
77	Operational Energy group India (P) Pvt Ltd	0.225	12.94	8.29

Sr. No.	Name of Project Promoter	Installed Capacity	Benchmark	Project IRR
	(Previously: Dr. Santosh Prabhu)			
78	Mahalingashetty & Co. Ltd.	0.60	13.79	3.67
79	Sri Venkatachalapathy Spinning Mills Pvt. Ltd.	0.75	13.02	9.14
80	Sri Venkatachalapathy Spinning Mills Pvt. Ltd.	0.75	13.02	9.14
81	Choudhary Exports	1.25	13.02	3.85
82	Ramraj Handlooms	0.85	12.94	5.27
83	Ramraj Handlooms	0.75	13.79	8.09
84	Ramraj Handlooms	0.75	13.02	5.99
85	N. Sumati	0.25	12.94	8.59
86	K. R. Nagarajan	0.25	12.94	8.72
Gujarat				
87	Air Control (India) Pvt. Ltd.	0.60	13.89	2.59
88	Badawe Engineers Pvt. Ltd.	0.60	13.81	4.13
89	Pragati Glass Pvt. Ltd.,	1.25	13.79	8.55
90	Siddharth Infra Tech Pvt. Ltd	0.60	13.81	3.44
91	Agarwal Enterprises	0.60	13.81	3.14
92	Agarwal Enterprises	0.60	13.81	3.14
93	Unique Sugars Ltd.	1.50	13.81	4.03
94	Jaychandra Agro Industries Pvt. Ltd.	0.60	13.81	3.12
Rajasthan				
95	Shree Ram Hotels	0.35	13.02	11.07
96	Chhabra Syncotex Ltd.	0.60	13.79	6.73
97	Chhabra Syncotex Ltd.	0.60	13.81	5.12
98	Chhabra Syncotex Ltd.	0.35	13.02	11.55
99	Sona Processors (India) Ltd.	0.35	13.02	8.63
100	Delhi Rajasthan Transport Co. Ltd.	0.35	13.79	8.61
101	Metro Cement and Mines Pvt. Ltd.	0.60	13.79	4.06
102	Sarvodaya Suitings Ltd	0.35	12.94	10.67
103	Sarvodaya Suitings Ltd	0.35	12.94	10.18
104	Free India Energy	1.25	12.94	11
Karnataka				
105	S C Shettar and Sons	1.25	13.81	8.65
106	Swarna Constructions	1.25	13.81	9.13
107	Suresh Kumar Sharma (HUF)	1.25	13.79	9.87
108	BEML Limited	1.25	13.81	10.45
109	BEML Limited	1.25	13.81	10.45
110	BEML Limited	1.25	13.81	10.45
111	BEML Limited	1.25	13.81	10.45

Sub-step 2d. Sensitivity analysis:

The Guidance on the Assessment of Investment Analysis (Version 02), paragraph 16, states that only variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation.

The different parameters that affect the viability of a wind power project are mentioned below –

- Electricity Generation/PLF: This is the most important and critical parameter for any Power Project & hence viability of the project will be affected by any fluctuation in this parameter. **Sensitivity analysis has therefore been carried out for it.**

- **Project Cost:** The gestation period in wind power projects is very small and no significant swing can be expected in the project cost in so short a period. Moreover there can be an increase of some percent in the cost but chances of it being reduced by 10 or even 5 percent is null. For the present project activity, the promoters had reached final negotiation of the price at the project conceptualization stage and had not expected either an increase or decrease in the project cost and hence, **sensitivity analysis has not been carried out for this parameter.**
- **O & M Cost:** This does not add to 20% of either total project cost or total project revenues and hence, **sensitivity analysis has not been carried out for this parameter:**

The O & M cost of the WTG against revenue ranges between 11.03% to 15.96% for Gujarat, 3.38% to 14.50% for Tamilnadu, 11.25% to 15.63% for Rajasthan, 13.05% to 17.67% for Maharashtra and 10.44% to 11.21% for Karnataka, 1.64% to 1.82% for Gujarat, 0.47% to 1.79% for Tamilnadu, 1.47% to 1.95% for Rajasthan, 1.54% to 1.86% for Maharashtra and 1.58% to .75% for Karnataka. From above it is clear that O & M costs neither add to 20% of total project cost nor to total project revenue, hence sensitivity is not carried out for this parameter.

- **Income from sale of electricity:** The parameter is dependent on two factors; PLF and tariff rate. Sensitivity analysis for PLF has already been carried out. The tariff rate was available with the Project Promoter vide the respective State Electricity Regulatory Commission Order; the PP has also signed the Power Purchase Agreements with State Utilities in which the Tariff rate is fixed for a defined period. So, **sensitivity analysis has not been carried out for income from sale of electricity.**

The sensitivity analysis is carried out on yearly basis, as the benchmark is prepared on yearly basis.

Sensitivity analysis for the Project commissioned before March 2004

Name of The Promoter	State	Work sheet No.	Avg. PLF/ CUF	Bench Mark	IRR	-10%	10%
Runwal Developers Pvt. Ltd.	Maharashtra	42	20%	12.94%	10.56 %	8.74 %	12.23 %
Sarvodaya Suitings Ltd.	Rajasthan	9	20%	12.94%	10.18 %	8.19 %	11.94 %
Free India Energy	Rajasthan	10	20%	12.94%	11.00 %	9.01 %	12.85 %

Sensitivity analysis for the project commissioned during financial year 2004-05: Benchmark calculated on December 2003 is considered for the financial year 2004-05.

Name of The Promoter	State	Work sheet No.	Avg. PLF/ CUF	Bench Mark	IRR	-10%	10%
Runwal Developers Pvt. Ltd.	Maharashtra	43	20%	12.94%	7.97%	6.09%	9.66 %
Dr. Santosh Prabhu	Tamilnadu	12	25%	12.94%	8.29%	6.29%	10.10%
Ramraj Handlooms	Tamilnadu	16	25%	12.94%	5.27 %	3.94 %	6.65 %
N. Sumati	Tamilnadu	17	25%	12.94%	8.59%	6.81%	10.22%
T.K.R. Nagarajan	Tamilnadu	18	25%	12.94%	8.72%	6.93%	10.35%
PMP Textiles Spinnig Pvt. Limited	Tamilnadu	22	25%	12.94%	10.28%	8.26%	12.13%
RCR Eco-Power	Tamilnadu	24	25%	12.94%	7.82%	5.83%	9.62%
Sarvodaya Suitings Ltd.	Rajasthan	8	22%	12.94%	10.67%	8.27%	12.78%

Sensitivity analysis for the project commissioned during financial year 2005-06

Name of The Promoter	State	Work sheet No.	Avg. PLF/ CUF	Bench Mark	IRR	-10%	10%
Mahabal Auto Ancillaries Pvt. Ltd.	Maharashtra	5	20%	13.02%	8.18%	6.28%	9.88%
Sri Anjaneya Cotton Mills Pvt. Ltd.	Maharashtra	14	20%	13.02%	7.73%	5.78%	9.49%
Agarwal Packaging Pvt. Ltd.	Maharashtra	18	20%	13.02%	10.18%	8.07 %	12.06 %
Pragati Agencies	Maharashtra	19	20%	13.02%	7.09%	5.22%	8.77%
Ankur Textiles	Maharashtra	20	20%	13.02%	4.40%	2.48%	6.08%
Vandana Textiles	Maharashtra	22	20%	13.02%	4.39 %	2.48%	6.08%
Sun Irrigation System Pvt. Ltd.	Maharashtra	23	20%	13.02%	5.49%	3.82%	7.20%
Jathar Textile Pvt. Ltd.	Maharashtra	24	20%	13.02%	5.07%	3.11%	6.83%
B. S. Channabasappa & Sons	Maharashtra	27	20%	13.02%	8.60%	6.65%	10.31%
Aerolex Cablenet	Maharashtra	28	20%	13.02%	8.11%	6.11%	9.87%
Economic Explosive Limited	Maharashtra	36	20%	13.02%	6.78%	4.95%	8.39%
Western Precicast Pvt. Ltd.	Maharashtra	39	20%	13.02%	8.23%	6.35%	9.92%
B.S. Channabasappa & Sons	Tamil Nadu	2	25%	13.02%	9.90%	8.02%	11.58%
B.S.C. Textiles	Tamil Nadu	3	25%	13.02%	9.90%	8.02%	11.58%
Swadeshi Dyeing & Bleaching Mills Private Limited	Tamil Nadu	5	25%	13.02%	8.85%	6.98 %	10.54%
Radha-Mohan Processors	Tamil Nadu	7	25%	13.02%	8.58%	6.59 %	10.39%
P. Vijaya Kumar	Tamil Nadu	9	25%	13.02%	9.63%	7.45%	11.62%
P. Mohan Lal	Tamil Nadu	10	25%	13.02%	8.61%	6.61%	10.39%
P. Mohan Lal	Tamil Nadu	11	25%	13.02%	9.63%	7.45%	11.62%
Ramraj Handlooms	Tamil Nadu	15	25%	13.02%	5.99%	4.21%	7.95%
Sri Venkatachalapathy Spinning Mills Pvt. Ltd.	Tamil Nadu	20	25%	13.02%	9.14%	7.05%	11.02%
Choudhary Exports	Tamil Nadu	21	25%	13.02%	3.85%	2.20%	5.75%
RCR Eco-Power (Coimbatour)	Tamil Nadu	23	25%	13.02%	5.39%	3.54%	7.05%
J-Son Foundry Pvt. Ltd.	Tamil Nadu	28	25%	13.02%	6.61%	4.76%	8.37%
Shree Ram International	Rajasthan	2	22%	13.02%	11.07%	9.02 %	12.90%
Sona Processors (India) Limited	Rajasthan	4	22%	13.02%	8.63%	6.57%	10.51%

Name of The Promoter	State	Work sheet No.	Avg. PLF/ CUF	Bench Mark	IRR	-10%	10%
Chhabra Syncotex Limited	Rajasthan	5	22%	13.02%	11.55%	9.91%	13.07%

Sensitivity analysis for the project commissioned during financial year 2006-07

Name of The Promoter	State	Work sheet No.	Avg. PLF/ CUF	Bench Mark	IRR	-10%	10%
Shree Ambika Auto Sales & Service	Maharashtra	1	20%	13.79%	9.62%	7.35%	11.63%
Unirose Textile Processors Pvt. Ltd.	Maharashtra	2	20%	13.79%	5.58%	3.33%	7.51%
Ushakal Nursing Home	Maharashtra	3	20%	13.81%	5.27%	3.34%	7.33%
Mahabal Metals Pvt. Ltd.	Maharashtra	4	20%	13.79%	7.93%	6.04%	9.58%
Sri Veerabhadreshwara Rice & Flour Mill	Maharashtra	6	20%	13.79%	5.34%	3.39%	7.38%
P. Mohan Lal	Maharashtra	7	20%	13.79%	5.25%	3.05%	7.29%
P. Vijaya kumar	Maharashtra	8	20%	13.79%	5.20%	3.01%	7.24%
B. C. Umapathy (Smaller HUF)	Maharashtra	9	20%	13.79%	6.32%	4.51%	8.17%
B.S.C. Textiles	Maharashtra	10	20%	13.79%	5.98%	4.18%	7.73%
S. K. Veerabhadrapa & Co.	Maharashtra	11	20%	13.79%	5.21%	3.09%	7.26%
Gem Laboratories Pvt. Ltd.	Maharashtra	12	20%	13.79%	9.27%	7.16%	11.14%
Harshita Sales Corporation	Maharashtra	13	20%	13.79%	5.74%	3.95%	7.64%
Mahalaxmi Infra Projects Limited	Maharashtra	15	20%	13.79%	5.27%	3.63%	6.91%
Choudhary Export	Maharashtra	16	20%	13.79%	8.41%	6.25%	10.35%
Agarwal Packaging Pvt. Ltd.	Maharashtra	17	20%	13.79%	5.07%	3.39%	6.84%
Umang Textiles	Maharashtra	21	20%	13.79%	4.97%	2.83%	6.87%
B. C. Chandrashekhar	Maharashtra	25	20%	13.79%	6.28%	4.29%	8.31%
B. C. Shivkumar	Maharashtra	26	20%	13.79%	6.30%	4.31%	8.36%
Sushila Overseas	Maharashtra	29	20%	13.79%	7.19%	5.04%	9.24%
Vostok (Fareast) Securities Pvt. Ltd.	Maharashtra	30	20%	13.79%	4.59%	2.90%	6.40%
Silverline Investment Co. Pvt. Ltd.	Maharashtra	31	20%	13.79%	4.83%	3.10%	6.64%
Bengal Cardboard Industries & Printers Pvt. Ltd.	Maharashtra	32	20%	13.79%	4.84%	3.09%	6.67%
Metal Link Alloys Ltd.	Maharashtra	33	20%	13.79%	9.72%	7.49%	11.70%

Name of The Promoter	State	Work sheet No.	Avg. PLF/ CUF	Bench Mark	IRR	-10%	10%
Chaphekar Engg. Pvt. Ltd.	Maharashtra	34	20%	13.79%	4.67%	3.01%	6.49%
Naik Sea-Foods Ltd.	Maharashtra	35	20%	13.79%	5.24%	3.52%	6.95%
R.D.S Construction	Maharashtra	37	20%	13.79%	5.94%	4.25%	7.70%
J-Sons Foundry Pvt. Ltd.	Maharashtra	41	20%	13.79%	5.12%	3.46%	6.80%
Kulkarni Power Tools Ltd.	Maharashtra	44	20%	13.79%	8.65%	6.50%	10.56%
Shankarlal	Tamil Nadu	1	27.46%	13.79%	9.04%	6.84%	11.04%
B.S.C. Textiles	Tamil Nadu	4	27.46%	13.79%	11.64%	9.64%	13.48%
Omprakash B. Agarwal	Tamil Nadu	6	27.46%	13.79%	9.42%	7.27%	11.34%
P. Vijaya Kumar	Tamil Nadu	8	27.46%	13.79%	10.42%	8.08%	12.58%
B.S. Channabasappa & Sons	Tamil Nadu	13	27.46%	13.79%	11.55%	9.52%	13.39%
Ramraj Handlooms	Tamil Nadu	14	27.46%	13.79%	8.09%	5.80%	10.20%
Mahalingashetty & Co. Ltd.	Tamil Nadu	19	27.46%	13.79%	3.67%	2.22%	4.99%
Western Precicast Pvt. Ltd.	Tamil Nadu	26	27.46%	13.79%	7.77%	6.00%	9.44%
J-Son Foundry Pvt. Ltd.	Tamil Nadu	27	27.46%	13.79%	7.64%	5.79%	9.28%
RCR Eco-Power	Tamil Nadu	29	27.46%	13.79%	5.67%	3.62%	7.46%
Pragati Glass Pvt. Ltd.	Gujarat	5	23%	13.79%	8.55%	6.54%	10.38%
Delhi Rajasthan Transport Co. Ltd.	Rajasthan	1	22%	13.79%	8.61%	6.53%	10.44%
Metro Cement Pvt. Ltd.	Rajasthan	2	22%	13.79%	4.06%	2.20%	5.68%
Chhabra Syncotex Limited	Rajasthan	6	22%	13.79%	6.73%	5.47%	7.89%
Suresh Kumar Sharma (HUF)	Karnataka	2	26.50%	13.79%	9.87%	7.50%	11.99%

Sensitivity analysis for the Project commissioned during financial year 2007-08

Name of The Promoter	State	Work sheet No.	Avg. PLF/ CUF	Bench Mark	IRR	-10%	10%
Air Control (India) Pvt. Ltd.	Maharashtra	38	20%	13.81%	3.63%	1.47%	5.38%
RCR Eco-Power	Tamilnadu	25	27.46%	13.81%	6.44%	4.35%	8.32%
Unique Sugar Ltd.	Gujarat	1	23%	13.81%	4.03%	2.08 %	5.78 %
Jaychandra Agro Industries Pvt. Ltd.	Gujarat	2	23%	13.81%	3.11%	1.17%	4.855
Agarwal Enterprises	Gujarat	3	23%	13.81%	3.14%	1.58%	4.71%
Badwe Enginners	Gujarat	4	23%	13.81%	4.13%	2.57%	5.53%

Name of The Promoter	State	Work sheet No.	Avg. PLF/ CUF	Bench Mark	IRR	-10%	10%
Pvt. Ltd.							
Siddarth Construction	Gujarat	6	23%	13.81%	3.44%	1.84%	4.87%
Air-Control (India) Pvt. Ltd.	Gujarat	7	23%	13.81%	2.59%	1.02%	4.29%
Chhabra Syncotex Limited	Rajasthan	7	26.50%	13.81%	5.12%	3.51%	6.54%
S. C. Shattar & Sons	Karnataka	1	26.50%	13.81%	8.65%	6.55%	10.51%
BEML Limited	Karnataka	3	26.50%	13.81%	10.45%	8.60%	12.13%
Swarna Constructions	Karnataka	4	26.50%	9.13%	7.40%	6.35%	10.99%

Sensitivity analysis for the Project commissioned during financial year 2008-09

Name of The Promoter	State	Work sheet No.	Avg. PLF/ CUF	Bench Mark	IRR	-10%	10%
J-Sons Foundry Pvt. Limited	Maharashtra	40	20%	15.07%	5.62%	3.69%	7.66%

As apparent from the above sensitivity analysis, with increase in power generation by 10%, the project IRRs (Post-tax) has improved. Project IRR (Post - tax) at increased generation without VCU revenue crosses the benchmark for the following PP

Name of The Promoter	State	Work sheet No.	Bench Mark	IRR	-10%	10%
Chhabra Syncotex Limited	Rajasthan	5	13.02%	11.55%	9.91%	13.07%

IRR of one of the PP is marginally crossing the benchmark with 10% increase in generation (for continuous 20 years of life span) which is a very rare scenario.

Step 3: Barrier analysis

Barrier analysis has not been used.

Step 4: Common practice analysis

Sub-step 4a: Analyze other activities similar to the proposed project activity:

The Indian wind energy sector has an installed capacity of 10,242MW as on March 31, 2009. The break-up of projects implemented in prominent wind potential states is as given below:

State-wise Wind Power Installed Capacity In India	
State	Total Capacity (MW) till 31.03.09
Andhra Pradesh	122.5
Gujarat	1,566.5
Karnataka	1,327.4
Kerala	27.0

State-wise Wind Power Installed Capacity In India	
State	Total Capacity (MW) till 31.03.09
Madhya Pradesh	212.8
Maharashtra	1,938.9
Orissa	
Rajasthan	738.4
West Bengal	1.1
Tamil Nadu	4,304.5
Others	3.2
Total	10,242.3

Source: www.inwea.org/aboutwindenergy.htm

The total installed capacity of power generation in India through all power generation sources is of 147,402 MW. Thus, installed capacity of wind power represents only 6.9% of the total installed capacity. Theoretical potential for wind power in India is more than 45,000 MW. This means that only 20% of the theoretical potential for wind power has been utilized.

In addition, in the existing wind projects, most of them have taken the CDM / VCU revenues, even for projects of small capacity the VCU benefits have been sought for financial consideration of the project.

Therefore, we can conclude that the project is not common practice.

Sub-step 4b: Discuss any similar Options that are occurring

As has been demonstrated Wind power is still not a common practice in the state of Maharashtra, Gujarat, Rajasthan, Tamilnadu and Karnataka.

2.6 Methodology Deviations

Not Applicable

3 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

3.1 Baseline Emissions

Baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

$$BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$$

Where

- BE_y = Baseline emissions in year y (t CO₂/yr)
- EG_{PJ,y} = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)
- EF_{grid,CM,y} = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (t CO₂/MWh)

Calculation of $EG_{PJ,y}$

The calculation of $EG_{PJ,y}$ is done as per option (a) greenfield plant. This case is described next

If the project activity is the installation of a Greenfield power plant, then

$$EG_{PJ,y} = EG_{\text{facility},y}$$

$EG_{\text{facility},y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr)

 $EF_{\text{grid},CM,y}$ is determined as follows:

The emission factor can be calculated in a transparent and conservative manner as follows

- (a) A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the “Tool to calculate the emission factor for an electricity system”

Or

- (b) The weighted average emission factor (in t CO₂e/MWh) of the current generation mix.
In the above scenario PP has choice to either Ex-ante emission factor which remains constant over the crediting period as per option (a) or use Ex-post emission factor which changes every year during crediting period as per option (b). Hence, PP decided to calculate & use the Ex-ante emission factor as per option (a). Baseline emission reductions have been estimated using combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the “Tool to calculate the emission factor for an electricity system” Annex 7, EB 97 (Version 6.0) by using the following steps

Step 1: Identify the relevant electricity systems

Central Electricity Authority (CEA), Government of India has published a delineation of the electricity system. All regional grids have been integrated as a single Indian Grid covering all the states

Geographical Scope of two regional grids:

Indian Grid				
Northern	Eastern	Western	North-Eastern	Southern
Chandigarh	Bihar	Chhattisgarh	Arunachal Pradesh	Andhra Pradesh
Delhi	Jharkhand	Gujarat	Assam	Karnataka
Haryana	Orissa	Daman & Diu	Manipur	Kerala
Himachal Pradesh	West Bengal	Dadar & Nagar Haveli	Meghalaya	Tamil Nadu
Jammu & Kashmir	Sikkim	Madhya Pradesh	Mizoram	Pondicherry
Punjab	Andaman- Nicobar	Maharashtra	Nagaland	Lakshadweep
Rajasthan		Goa	Tripura	
Uttar Pradesh				
Uttaranchal				

The project activity supplies electricity to the Indian grid.

Step 2: Choose whether to include off-grid power plants in the project electricity system (optional)

Project participants may choose between the following two options to calculate the operating margin and build margin emission factor:

Option I: Only grid power plants are included in the calculation.

Option II: Both grid power plants and off-grid power plants are included in the calculation.

PP has chosen the option I to calculate the operating margin and build margin emission factor

Step 3: Select a method to determine the operating margin (OM)

The calculation of the operating margin emission factor ($EF_{\text{grid,OM,y}}$) is based on one of the following methods,

- a. Simple OM; or
- b. Simple adjusted OM; or
- c. Dispatch data analysis OM; or
- d. Average OM.

The simple OM method (Option A) can be used if Low-cost/must-run resources constitute less than 50 %of total grid generation (excluding electricity generated by off-grid power plants) in: 1) average of the five most recent years, and the average of the five most recent years shall be determined by using one of the approaches described below; or 2) based on long-term averages for hydroelectricity production (minimum time frame of 15 years).

The low-cost/must-run resources constitute less than 50% of total grid generation in the average of the five most recent years (Refer below table)

Share of Must-Run (Hydro/Nuclear) (% of Net Generation)

	2011-12	2012-13	2013-14	2014-15	2015-16
India	19.6%	16.9%	18.6%	16.8%	15.1%

Data Source: Central Electricity Authority (CEA) database Version 12, May 2017

The above data clearly shows that the percentage of total grid generation by low cost/must run plants (on the basis of average of three most recent years) for the INDIAN grid is less than 50% of the total generation. Thus the average emission rate method cannot be applied, as low cost/must run resources constitute less than 50% of total grid generation.

For the simple OM, the simple adjusted OM and the average OM, the emissions factor can be calculated using either of the two following data vintages

Ex-ante option: if the ex-ante option is chosen, the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required. For grid power plants, use a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation.

Ex post option: if the ex post option is chosen, the emission factor is determined for the year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring. If the data required to calculate the emission factor for year y is usually only available later than six months after the end of year y , alternatively the emission factor of the previous year $y-1$ may be used. If the data is usually only available 18 months after the end of year y , the emission factor of the year proceeding the previous year $y-2$ may be used. The same data vintage (y , $y-1$ or $y-2$) should be used throughout all crediting periods.

The project proponent choose the Ex-ante option for estimating the simple OM emission factor wherein as described above a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation, without requirement to monitor and recalculate the emissions factor during the crediting period will be undertaken.

Step 4: Calculate the operating margin emission factor according to the selected method

The simple OM emission factor is calculated as the generation-weighted average CO₂ emissions per unit net electricity generation (t CO₂/MWh) of all generating power plants serving the system, not including low-cost/must-run power plants/units.

The simple OM may be calculated

Option A: Based on the net electricity generation and a CO₂ emission factor of each power unit;
or

Option B: Based on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system.

Option B can only be used if:

- The necessary data for Option A is not available; and
- Only nuclear and renewable power generation are considered as low-cost/must-run power sources and the quantity of electricity supplied to the grid by these sources is known; and
- Off-grid power plants are not included in the calculation (i.e. if Option I has been chosen in Step 2).

As the all three conditions for using above option B are applicable for the project, PP has chosen the option B for calculating the simple OM as follows

Under this option, the simple OM emission factor is calculated based on the net electricity supplied to the grid by all power plants serving the system, not including low-cost/must-run power plants/units, and based on the fuel type(s) and total fuel consumption of the project electricity system, as follows:

$$EF_{grid,OMsimple,y} = \frac{\sum_i FC_{i,y} \times NCV_{i,y} \times EF_{CO2,i,y}}{EG_y}$$

Where,

$EF_{grid,OMsimple,y}$	=	Simple operating margin CO ₂ emission factor in year y (t CO ₂ /MWh)
$FC_{i,y}$	=	Amount of fuel type i consumed in the project electricity system in year y (mass or volume unit)
$NCV_{i,y}$	=	Net calorific value (energy content) of fuel type i in year y (GJ/mass or volume unit)
$EF_{CO2,i,y}$	=	CO ₂ emission factor of fuel type i in year y (t CO ₂ /GJ)
EG_y	=	Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must-run power plants/units, in

- i = year y (MWh)
 = All fuel types combusted in power sources in the project electricity system in year y
 y = The relevant year as per the data vintage chosen in Step 3

OM value has been referred from CEA database⁷ which referred the “Tool to calculate the emission factor for an electricity system” OM calculation has been done ex-ante and hence OM value will remain fixed and need not be monitored during the crediting period.

The operating margin emission factor has been calculated using a 3 year data vintage:

Emission Factors (tCO ₂ /MWh) (incl. Imports)	2013-14	2014-15	2015-16
Simple Operating Margin (1) (2)	1.00	0.99	0.9655
Weighted Generation Operating Margin	0.9853		

The weighted average simple operating margin emission factor ($EF_{grid,OM,Simple,y}$) for the project will serve **0.9853** t CO₂/MWh.

Step 5: Calculate the build margin (BM) emission factor

For the vintage data PP has chosen the Option 1 of step 5 (Refer “Tool to calculate the emission factor for an electricity system”, Version 6.0, EB 97, Annex 7). BM calculation has been done ex-ante and hence BM value will remain fixed and need not be monitored during the crediting period.

BM value has been taken from CEA database.⁸ “Tool to calculate the emission factor for an electricity system” has been used in the CEA baseline database for the calculation of build margin. The value of build margin emission factor is **0.9082** t CO₂/MWh

Step 6: Calculate the combined margin emissions factor

The calculation of the combined margin (CM) emission factor ($EF_{grid,CM,y}$) is based on one of the following methods:

- (a) Weighted average CM; or
- (b) Simplified CM.

PP has chosen the weighted average CM method (Option A) used as the preferred option

$EF_{grid,CM,y}$ is determined as follows

The weighted average of the Operating Margin emission factor ($EF_{grid,OM,y}$) and the build margin emission factor ($EF_{grid,BM,y}$) :

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times w_{OM} + EF_{grid,BM,y} \times w_{BM}$$

Where

- $EF_{grid,OM,y}$ = Build margin CO₂ emission factor in year y (t CO₂/MWh)
- $EF_{grid,BM,y}$ = Operating margin CO₂ emission factor in year y (t CO₂/MWh)
- w_{OM} = Weighting of operating margin emissions factor (%)
- w_{BM} = Weighting of build margin emissions factor (%)

⁷ http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver12.pdf

⁸ http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver12.pdf

The following default values should be used for W_{OM} and W_{BM}

Wind and solar power generation project activities: $W_{OM} = 0.75$ and $W_{BM} = 0.25$ (owing to their intermittent and non-dispatchable nature) for the first crediting period and for subsequent crediting periods;

Thus, the CM emission factor ($EF_{grid,CM,y}$) for the project has been calculated to be

$$\begin{aligned} EF_{grid,CM,y} &= EF_{grid,OM,y} \times 0.75 + EF_{grid,BM,y} \times 0.25 \\ &= 0.9853 \times 0.75 + 0.9082 \times 0.25 \\ &= 0.9660 \text{ t CO}_2/\text{MWh} \end{aligned}$$

3.2 Project Emissions

The project activity involves renewable power generation, hence $PE_y = 0$

3.3 Leakage

The project activity involves renewable power generation hence, no leakage emission are considered

3.4 Net GHG Emission Reductions and Removals

Baseline Emission Factor $EF_{grid,CM,y}$ is calculated as the weighted average of the operating margin emission factor ($EF_{grid,OM,y}$) and the build margin emission factor ($EF_{grid,BM,y}$), where the weight $W_{OM} = 0.75$ and $W_{BM} = 0.25$.

The emission factor which is calculated by the CEA are as follows

Indian Grid: 0.9660 t CO₂/MWh

The baseline emission for the project was calculated by using following formula-

$$\text{Baseline emissions (t CO}_2/\text{yr)} = \text{Power generated from the project (MWh/yr)} * \text{Grid Emission Factor (t CO}_2/\text{MWh)}$$

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

Where

$$\begin{aligned} ER_y &= \text{Emission reductions in year } y \text{ (t CO}_2\text{e)} \\ BE_y &= \text{Baseline emissions in year } y \text{ (t CO}_2\text{e)} \\ PE_y &= \text{Project emissions in year } y \text{ (t CO}_2\text{e)} \end{aligned}$$

Year	Estimated baseline emissions or removals (tCO ₂ e)	Estimated project emissions or removals (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated net GHG emission reductions or removals (tCO ₂ e)
------	---	--	--	--

2016-17	140,590	0	0	140,590
2017-18	140,590	0	0	140,590
2018-19	140,590	0	0	140,590
2019-20	140,590	0	0	140,590
2020-21	140,590	0	0	140,590
2021-22	140,590	0	0	140,590
2022-23	140,590	0	0	140,590
2023-24	140,590	0	0	140,590
2024-25	140,590	0	0	140,590
2025-26	140,590	0	0	140,590
Total	1,405,900	0	0	1,405,900

4 MONITORING

4.1 Data and Parameters Available at Validation

Data / Parameter	EF_{grid, CM, y}
Data unit	t CO ₂ / MWh
Description	Combined Margin CO ₂ emission factor of Indian Grid
Source of data	CO ₂ Baseline Database for the Indian Power Sector User Guide, Version 04 Central Electricity Authority (CEA), Govt. of India.
Value applied	0.9660
Justification of choice of data or description of measurement methods and procedures applied	Calculated from CO ₂ Baseline Database for the Indian Power Sector User Guide, Version 12 Central Electricity Authority (CEA), Govt. of India.
Purpose of Data	Data are used for baseline emission calculation
Comments	-

Data / Parameter	EF_{grid, OM, y}
Data unit	t CO ₂ / MWh
Description	CO ₂ operating margin emission factor of Indian Grid
Source of data	CO ₂ Baseline Database for the Indian Power Sector User Guide, Version 12 Central Electricity Authority (CEA), Govt. of India.
Value applied	0.9853
Justification of choice of data or description of measurement methods and procedures applied	Directly taken from CO ₂ Baseline Database for the Indian Power Sector User Guide, Version 12 Central Electricity Authority (CEA), Govt. of India.
Purpose of Data	Data are used for baseline calculation and Emission reduction from the project activity
Comments	-

Data / Parameter	EF_{grid, BM, y}
------------------	---------------------------------

Data unit	t CO ₂ / MWh
Description	CO ₂ build margin emission factor of Indian Grid
Source of data	CO ₂ Baseline Database for the Indian Power Sector User Guide, Version 12 Central Electricity Authority (CEA), Govt. of India.
Value applied	0.9082
Justification of choice of data or description of measurement methods and procedures applied	Directly taken from CO ₂ Baseline Database for the Indian Power Sector User Guide, Version 12 Central Electricity Authority (CEA), Govt. of India.
Purpose of Data	Data are used for baseline calculation and Emission reduction from the project activity
Comments	-

4.2 Data and Parameters Monitored

Data / Parameter	EG_{PJ,y}
Data unit	MWh
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y ($EG_{facility,y} = EG_{PJ,y}$)
Source of data	Data is obtained from the State Electricity Board (SEB)'s official source to use from - • Maharashtra State – MSEDCL • Gujarat – GUVNL • Rajasthan – JVVNL • Tamil Nadu – TNEB • Karnataka - KPTCL
Description of measurement methods and procedures to be applied	Monitoring: Tri-vector meter will be used for monitoring Data Type: Measured & signed Jointly by State utility officials & PP's representative. Frequency: Hourly measured Recording: Monthly from Main meter at state utility substation Archiving Policy: Paper & Electronic Responsibility: Project Head would be responsible for regular calibration of the meter. Calibration Frequency: 5 years
Frequency of monitoring/recording	Continuous monitoring and monthly recording
Value applied	145,539⁹
Monitoring equipment	Please refer Annexure I for more details
QA/QC procedures to be applied	The project electricity generation is based on the net units displaced as measured by main metering system installed at the interconnection point (substation point) and losses are calculated for respective states whichever is applicable. The net electricity exported to the grid is cross checked electricity sales receipt (Invoice).
Purpose of data	Calculation of baseline emissions
Calculation method	Taken from credit report

⁹ Please refer VER calculation sheet

Comments	Data will be archived for the entire crediting period + 2 years
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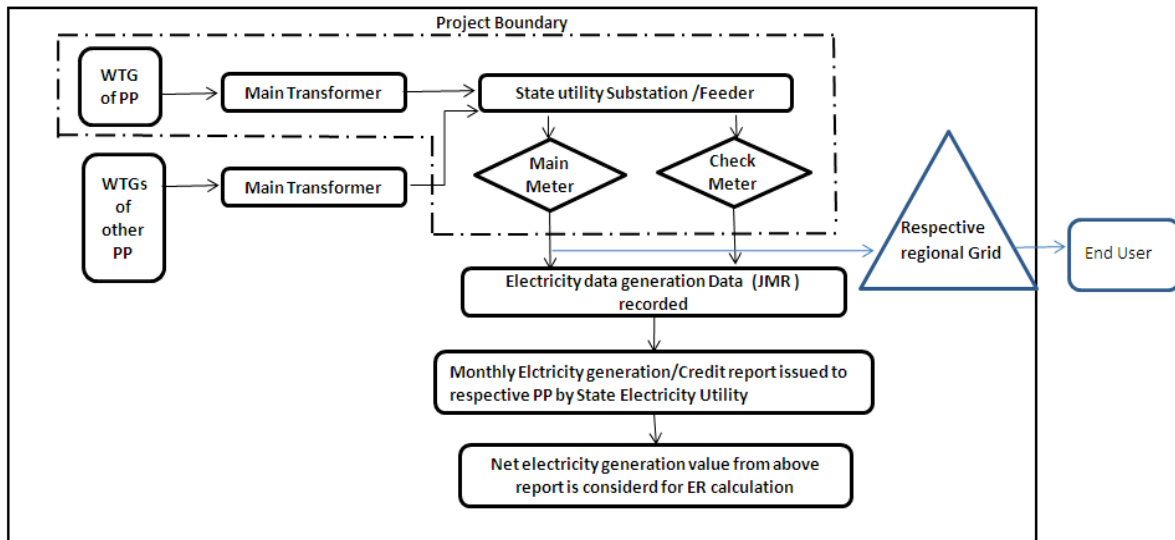
4.3 Monitoring Plan

I) Data collection, aggregation, recording, calculation and reporting procedure:

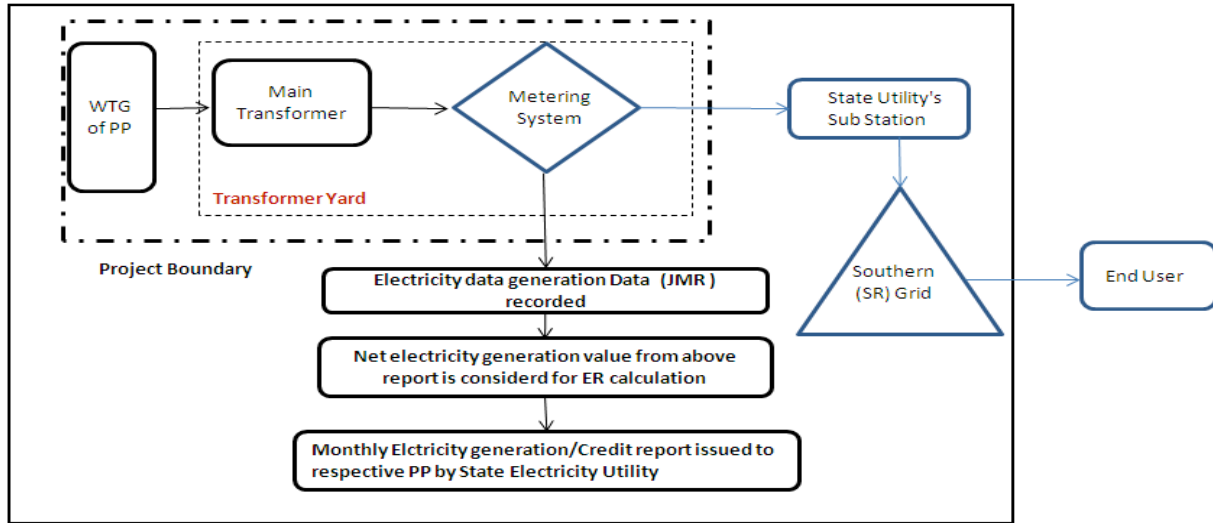
Monitoring of electricity generation was carried out continuously with trivector electronic meter. This helps to avoid manual data handling error, material misstatement and gives accurate measurement. . The calibration of monitoring equipments needed to be done as per the regulation of state utility. All monitoring parameters was recorded and verified by the responsible authorities of project participants. For metering & monitoring of the electricity generation from Wind Turbine Generator, the specific method applied was as per the Power Purchase Agreement as outlined below.

- The recording of the electricity exported to the state utility grid is done jointly at the incoming feeder of the state utility.
- The joint meter readings are carried out once in a month in presence of both parties (the developer's representative and officials of the state electricity utility). Both parties sign meter reading of exported power. This forms the basis of invoicing.
- Using the signed joint measurement/meter reading, each respective state electricity utility entity, issues electricity generation/credit report to corresponding PP. the credit report shows the amount of electricity exported to the grid and this value in this report is used for calculations emission reductions.

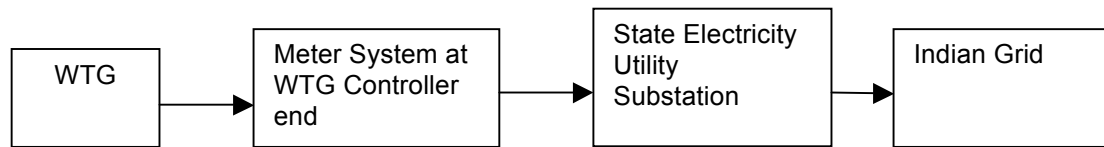
II) Schematic diagram of monitoring system for state of Maharashtra, Rajasthan as shown below:



III) Schematic diagram of monitoring system state of Tamil Nadu and Karnataka as shown below:



IV) The Metering system details of project activity for Gujarat state is illustrate in below figure:



The project promoters signed operation and maintenance agreements with the O & M contractor of the wind turbines. The performance of the turbines, safety in operation and scheduled /breakdown maintenances is the responsibility of O & M contractor and are organized and monitored by them, hence the authority and responsibility of project management on site lies with the O & M contractor who maintains all the data/ records for the project monitoring.

(a) The electricity apportioning procedure followed by state electricity utility in Maharashtra, Rajasthan:

The apportioning procedure followed by state electricity utilities in the two states is explained below:

The gross generation of all 'X' WTGs is G_G (Adding all controllers)

$$G_G = G_1 + G_2 + G_3 + \dots + G_X \text{ (Controller reading)}$$

The G_1 value is electricity (kWh) from respective WTG controller reading.

Total gross export (G_{export}) of electricity to the grid by all WTGs connected to a single joint meter (main meter) measured at substation.

$$G_{\text{export}} = G_{1 \text{ export}} + G_{2 \text{ export}} + G_{3 \text{ export}} + \dots + G_{X \text{ export}}$$

The value of G_{export} is available from joint meter reading (Main meter) reported as per procedure mentioned in section 11.05 of PPA Maharashtra State & Section 4.2 (ii) of PPA Rajasthan state.

Total gross import (G_{import}) of electricity from grid by all WTGs connected to joint meter (main meter) measured at substation.

$$G_{\text{import}} = G_{1 \text{ import}} + G_{2 \text{ import}} + G_{3 \text{ import}} + \dots + G_{X \text{ import}}$$

Hence, the WTG wise electricity generation ($G_{1 \text{ export}}$) breakup is derived as follows-

$$(G_{1 \text{ export}}) = (G_{\text{export}} \times G_1) / G_G$$

Similarly, the WTG wise electricity import ($G_{1 \text{ import}}$) breakup is derived as follows-

$$(G_{1 \text{ import}}) = (G_{\text{import}} \times G_1) / G_G$$

Having derived the electricity exported in to the grid ($G_{1 \text{ export}}$) and electricity imported from the grid ($G_{1 \text{ import}}$) for each WTG, the net electricity export ($G_{1 \text{ net export}}$) is derived as follows:

$$(G_{1 \text{ net export}}) = G_{1 \text{ export}} - G_{1 \text{ import}}$$

The sum total of the net electricity export ($G_{1 \text{ export}} + G_{2 \text{ export}} + G_{3 \text{ export}} + \dots + G_{X \text{ export}}$) value is reported/recorded in the monthly credit report/ generation report form which is used for billing electricity utility. This is the value which is referred as Electricity generated by the project activity and used for calculating emission reductions for the project.

The electricity apportioning procedure followed by State Electricity utility in State of Gujarat

The system consists of a state- of- the- art controlling and monitoring and well trained staff personnel of O & M contractor. O & M staff is always present on the site to monitor various parameters of power generation and deal with any problems related to generation, transmission or maintenance.

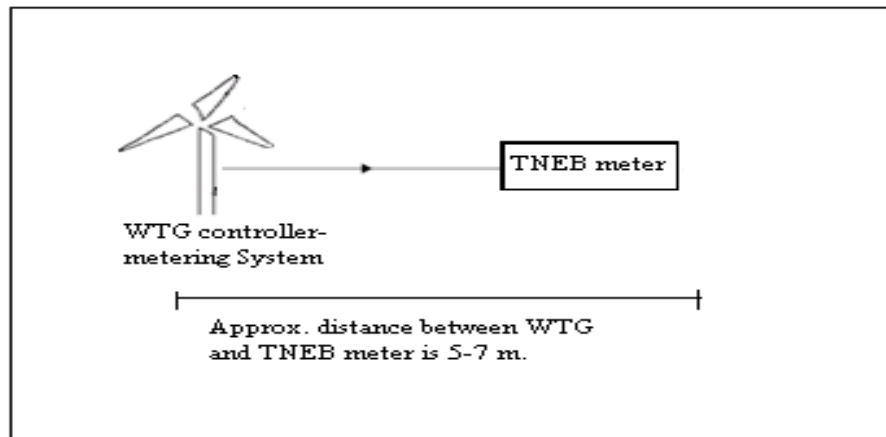
The project activity essentially involves generation of electricity utilizing wind energy. The WTG converts wind energy into electrical energy and does not utilize any other input fuel for electricity generation. The evacuation facility is essentially maintained by the state power utility. The monitoring of the generated electricity would be carried out in two fold.

- a. Electricity generation measured continuously by main meter located adjacent to the WTG in the switchyard and recorded monthly by state utility in presence of representative of client
- b. There is transmission loss between the individual WTG and substation. This loss is proportionally divided among the WTGs connected to the meter on the basis of the prorata reading taken at the individual WTG meter. The final share certificate issued to the project proponent is based on the electricity generated minus losses. This is issued by state utility.
- c. The billing will be on monthly basis project proponent raise invoice and submit to GUVNL for payment based on Joint meter reading (certificate of share of electricity) certified by state utility at the end of each month for the energy supplied.

The electricity apportioning procedure followed by State Electricity utility in State of Tamil Nadu:

The monitoring system consists of monitoring of two parameters:-

- Reading of electricity import & export at the WTG controller.
- Reading of electricity imports & export at the metering point of TNEB., located approximately 5 -7 m. from the WTG. Each WTG has its individual EB meter, installed by the State utility.



Hence there is no need to apportioning of electricity generation in case of Tamil Nadu.

The import & export figure at WTG controller will be recorded in the logbooks of the O & M contractor on a daily basis. This data will be preserved in paper or electronic form. They will submit the summary of the generation to the PP on a daily & monthly basis.

The TNEB meter will be the main source for monitoring net export to the grid. Monthly reading from the TNEB meter will be recorded by the engineers of the state utility in presence of the O & M contractor who represents PP. Subsequently the statement will be prepared.

Hence, $EG_{(Net\ export\ by\ project\ activity)} = EG_{JMR,export} - EG_{JMR,import}$, at TNEB (HTSC) metering point.

The electricity apportioning procedure followed by State Electricity utility in State of Karnataka:

There is no apportioning of electricity generation in case of Karnataka.

Each WTG is equipped with display control panels. All the electricity exported from the WTGs is recorded from the main and check meter installed at metering point near the WTGs. The electricity generated from customers WTG is injected in to Bulk meter at site (maintain by site developer/ contractor) through main and check meter of metering point. Monthly generation of individual metering points are measured with main and check meter. The electricity is then supplied to substation and subsequently to grid

(b) Procedures for handling internal auditing and non-conformities.

An internal audit of the project activity has already been done on a half yearly basis by a special audit team. The audit team has comprised competitive persons. The team was already audited the project for the following aspects among other things:

- Are the monitoring of VCS parameters done in line with the VCS PD Is the documentation of monitored VCS parameters done properly
- Are equipments calibrated and maintained as scheduled
- Is the quantity of VERs generated in line with that projected in the VCS PD, if not, what are the reasons for deviation?
- Are necessary corrective actions being taken to address deviations?
- Check the authenticity of data monitored and recorded by random cross-checking with other sources.

The audit team would submit their observations to Head- Wind Power Projects for his review and necessary action.

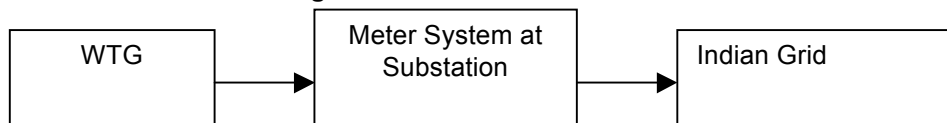
(c) Emergency preparedness procedures:

Each WTG has emergency preparedness procedure in place as per standard utility practices to avoid damage to generating facility, public & material safety, and state utility property. This is a requirement in the PPA (section 5.02 [b] of PPA (Maharashtra), Section 12 of PPA (Tamil Nadu), Section 4(viii) of PPA (Rajasthan), Section 7.1 of PPA (Gujarat) and section 7 of PPA (Karnataka). In case of emergency for metering system (Main meter) fails, the corresponding check meter reading is considered for electricity measurement. However, no such event of main meter failure occurred during the monitoring period.

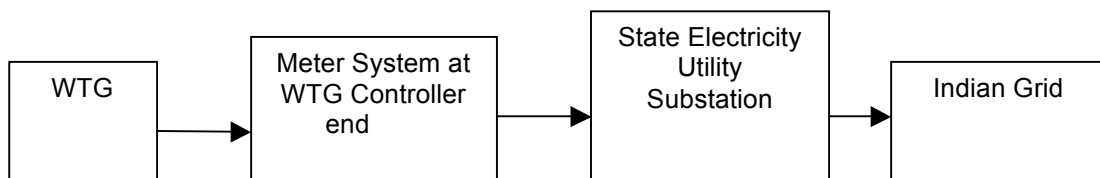
(d) Metering System:

The metering system for the project activity in all the five states can categorize as follows:

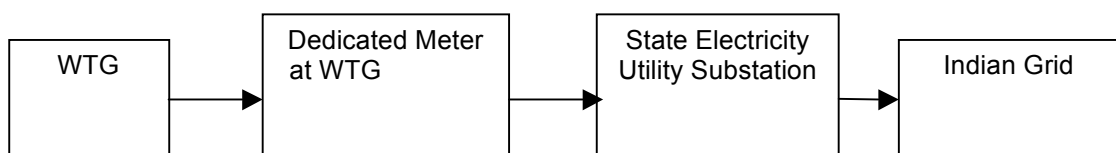
The Metering system of project activity for Maharashtra, Rajasthan and Karnataka State are illustrated in below figure.



The Metering system of project activity for the state of Gujarat is illustrated in below figure.



The Metering system of project activity for state of Tamil Nadu is illustrated in below figure.



(d) Monitoring Roles and Responsibility:

Roles	Responsibilities
PP (Director)	Review the overall performance of project & give directions for improvements.
PP (Project Manager)	Review the performance of project. preparing & submitting the annual reports, supporting documents for validation & verification of VERs
EPC contractor – Site In charge	Judge the performance of project through reports from clerks & plant operators on site. Visits to plant site & instruct to plant operators for improvement in performance. Compile data & reports to available for audit, review the performance of the project
EPC contractor - Clerks	Day to day monitoring, record, report & archive data as received contains overall conditions on wind farm.
EPC contractor - Plant Operators (O & M Staff)	Daily monitoring, checking routine Operation & Maintenance activities, reporting for any major O &M and Preventive Maintenance.
State Electricity Authority	Credit report Generation Calibration of Energy Meters
MITCON Consultancy & Engineering services Ltd (Project Consultant)	Central GHG data management Work as central coordinator for DOE and PP Central role as consultant to every aspect of project

Project participant has signed an operation and maintenance agreement with the supplier of the wind turbines. The performance of the turbines, safety in operation and scheduled /breakdown maintenances is responsibility of EPC contractor and is organized and monitored by them. So the authority and responsibility of project management lies with the EPC contractor are as follows.

Project Executer and Controller (EPC Contractor):

- Overall functioning of the project activity and co-ordination between supplier and the management of project participant.
- Coordinating with PP/Consultant/Auditors during their site visit for validation/annual verification.
- Requesting/coordinating State Utility for annual calibration behalf of PP

Operation and Maintenance (EPC Contractor):

- Daily monitoring, checking routine Operation & Maintenance activities, reporting for any major O &M and Preventive Maintenance.
- The O&M Team of WTG supplier is responsible for Maintain and Operate the WTG

Site Main Controller (EPC Contractor):

- Site Engineer of EPC Contractor is involved in monitoring the daily/monthly generation recording of controller data, archive of data.

Monthly JMR (joint meter reading) reading taken by state utility & Site engineer of EPC Contractor

5 SAFEGUARDS

5.1 No Net Harm

No negative impact of project activity

5.2 Environmental Impact

As per the Schedule 1 of Ministry of Environment and Forests (Government of India) notification dated January 27, 1994 and further modified on 14th September, 2006, regarding requirement of Environment Impact Assessment (EIA) studies for a range of infrastructure projects, 38 categories of the proposed industry or project is required to undertake EIA studies. The details of these activities are available at: <http://envfor.nic.in/divisions/iass/notif/eia.htm>.

The proposed project doesn't fall under the list of activities requiring EIA as it will not involve any negative environmental impacts, as the WTGs installation for generation of power use wind (cleanest possible source of renewable energy). In India, wind power projects do not require an EIA.

5.3 Local Stakeholder Consultation

The Stakeholders were identified as local villagers, technology suppliers, local farmers, students and were invited through invitation letter in advance and in person to attain the stakeholder consultation meeting. The representative from PPs, briefed stakeholders about the following points-

- Purpose of the meeting
- An overview of global warming & the VCS project activity.
- Carbon Sale benefit related to project activity.
- Project promoters, process & responsibility
- Benefits of wind project (environmental & social) with example
- Project promoter's business, role in wind power in India for GHG emission reduction

Details of the stakeholders Meeting

Sr. No.	Name of Project Promoter	Installed Capacity	Invitation letter send	Date of meeting	Venue	Time	Language for communication
Maharashtra							
1	Pragati Agencies	1.25	18/08/2006	25/08/2006	Village-Dahiwadi, Taluka-Kavathe Mahankal, Sangli, Maharashtra	11:00 AM	Marathi / English
2	Umang Textiles	0.60	18/08/2006	25/08/2006	Village-Nagraj, Taluka-Kavathe Mahankal, Sangli, Maharashtra	11:00 AM	Marathi / English
3	Ankur Textiles	0.60	18/08/2006	25/08/2006	Village-	11:00	Marathi

Sr. No.	Name of Project Promoter	Installed Capacity	Invitation letter send	Date of meeting	Venue	Time	Language for communication
				6	Shelkewadi, Taluka-Kavathe Mahankal, Sangli, Maharashtra	AM	/ English
4	Vandana Textiles	0.60	18/08/2006	25/08/2006	Village-Kundlapur, Taluka-Kavathe Mahankal, Sangli, Maharashtra	11:00 AM	Marathi / English
5	Sun Irrigation System (P) Ltd.	0.60	16/09/2006	23/09/2006	Village-Shelkewadi, Taluka-Kavathe Mahankal, Sangli, Maharashtra	4:30 PM	Marathi / English
6	Jathar Textiles Pvt. Ltd.	0.60	13/09/2006	20/07/2006	Village-Kundlapur, Taluka-Kavathe Mahankal, Sangli, Maharashtra	11:00 AM	Marathi / English
7	B. C. Chadrashekhhar	0.60	16/09/2006	23/09/2006	Village-Shelkewadi, Taluka-Kavathe Mahankal, Sangli, Maharashtra	4:30 PM	Marathi / English
8	B.C. Shivakumar	0.60	16/09/2006	23/09/2006		4:30 PM	Marathi / English
9	Aerolex Cablenet	1.25	16/09/2006	23/09/2006		4:30 PM	Marathi / English
10	B. S. Channabasappa & Sons	1.25	16/09/2006	23/09/2006		4:30 PM	Marathi / English
11	Air Control (India) Pvt. Ltd.	0.60	29/09/2008	7/10/2008	Village-Gudepanchnib (Sonawade), Taluka-Shirala, Sangli, Maharashtra	12:00 PM	Marathi / English
12	Bengal Cardboard Industries & Printers Pvt. Ltd.	0.60	12/4/2006	18/04/2006	Village-Aichale, Nandurbar, Maharashtra	11:30AM	Marathi / English
13	Chaphekar Engineering Pvt. Ltd.	0.60	15/02/2009	24/02/2009	Gudepanchni Site	11:30AM	Marathi / English
14	Economic Explosives Limited	1.25	10/2/2008	20/02/2008	Vavad, Nandurbar	11:30AM	Marathi / English

Sr. No.	Name of Project Promoter	Installed Capacity	Invitation letter send	Date of meeting	Venue	Time	Language for communication
15	Jsons Foundry Private Limited	0.60	7/3/2008	8/3/2008	Gude Panchagani	11:00 AM	Marathi / English
16	Jsons Foundry Private Limited	0.60	7/3/2008	8/3/2008		11:00 AM	Marathi / English
17	Jsons Foundry Private Limited	0.60	7/3/2008	8/3/2008		11:00 AM	Marathi / English
18	Western Precicast Pvt Ltd	1.25	12/3/2008	31/03/2008	Vavad, Nandurbar	11:30AM	Marathi / English
19	Metal Link Alloys Ltd.	1.25	20/01/2009	30/01/2009	Amkhel - Bramhanvel	11:30AM	Marathi / English
20	Naik Sea Foods Ltd.	0.60	10/4/2008	15/04/2008	Village-Aichale, Nandurbar, Maharashtra	11:30AM	Marathi / English
21	RDS Construction Company	0.60	18/07/2008	22/07/2008	Village-Aichale, Nandurbar, Maharashtra	11:30 AM	Marathi / English
22	Silverline Investment Co. Pvt. Ltd.	0.60	12/4/2006	18/04/2006	Village-Aichale, Nandurbar, Maharashtra	11:30 AM	Marathi / English
23	Sushila Overseas	0.60	31/01/2009	3/2/2009	Village-Shelkewadi, Taluka-Kavathe Mahankal, Sangli, Maharashtra	2:00 PM	Marathi / English
24	Vostok (Fareast) Securities Pvt. Ltd.	0.60	12/4/2006	18/04/2006	Village-Aichale, Nandurbar, Maharashtra	11:30 AM	Marathi / English
25	Shree Ambica Auto Sales & Service	1.25	28/05/2007	4/6/2007	Dhalgaon	10:30 AM	Marathi / English
26	Unirose Textile Processors Pvt. Ltd.	0.60	20/02/2007	28/02/2007	Tisangi	10:30 AM	Marathi / English
27	B. S. C. Textiles	0.60	2/10/2006	9/10/2006	Shelkewadi	9:30 AM	Marathi / English
28	P. Vijaya Kumar	0.60	6/9/2006	29/09/2006	Wagholi	10:30 AM	Marathi / English
29	B. C. Umapathy (smaller HUF)	0.60	4/10/2006	10/10/2006	Shelkewadi	10:00 AM	Marathi / English
30	P. Mohan Lal	0.60	6/9/2006	29/09/2006	Wagholi	10:30 AM	Marathi /

Sr. No.	Name of Project Promoter	Installed Capacity	Invitation letter send	Date of meeting	Venue	Time	Language for communication
							English
31	S. K. Veerbhadrappa & Co	0.60	1/12/2006	1/12/2006	Shelkewadi	9:30 AM	Marathi / English
32	Sree Veerbhadreshwara Rice & Flour Mill	0.60	2/1/2007	17/01/2007	Shelkewadi	11:00 AM	Marathi / English
33	GEM Lab. Pvt. Ltd.	1.25	3/7/2007	10/7/2007	location no. K-252	10:30 AM	Marathi / English
34	GEM Lab. Pvt. Ltd.	1.25	3/7/2007	10/7/2007	location no. J-119	10:30 AM	Marathi / English
35	Sri Anjaneya Cotton Mills Pvt. Ltd.	1.25	29/06/2007	10/7/2007	location no. K-255	10:30 AM	Marathi / English
36	Sri Anjaneya Cotton Mills Pvt. Ltd.	1.25	29/06/2007	10/7/2007	location no. K-261	10:30 AM	Marathi / English
37	Harshita Sales Corporation	0.60	6/2/2007	13/02/2007	Garjewadi	10:00 AM	Marathi / English
38	Ushakal Nursing Home	0.60	14/02/2007	25/02/2007	Nagaj	1:30 PM	Marathi / English
39	Mahabal Auto Ancillaries Pvt. Ltd	1.25	19/02/2007	27/02/2007	Birenwadi	12:30 PM	Marathi / English
40	Mahabal Metals Pvt. Ltd	1.25	3/4/2007	10/4/2007	Akrale	2:30 PM	Marathi / English
41	Mahalaxmi Infraprojects Limited	1.50	18.07.2008	22.07.2008	Shanimandal & Akhatwad	11:30 AM	Marathi / English
42	Agarwal Packaging Pvt. Ltd.	1.25	01.05.2008	16.05.2008	Sanfli	11:30 AM	Marathi / English
43	Agarwal Packaging Pvt. Ltd.	0.60	01.05.2008	16.05.2008	Gudhe	11:30 AM	Marathi / English
44	Choudhary Exports	1.25	20.01.2009	30.01.2009	Khori Titane	11:30 AM	Marathi / English
45	Runwal Developers Pvt. Ltd.	1.25	16/02/2007	17/03/2007	Khori, Tal-Sakri, Dhule	2:30 PM	Marathi / English
46	Runwal Developers Pvt. Ltd.	1.25	16/02/2007	17/03/2007	Khori, Tal-Sakri, Dhule	2:30 PM	Marathi / English
47	Kulkarni Power	1.25	4/12/2008	18/04/2009	Aichale,	11:30	Marathi

Sr. No.	Name of Project Promoter	Installed Capacity	Invitation letter send	Date of meeting	Venue	Time	Language for communication
	Tools Ltd.			8	Nandurbar district	AM	/ English
Tamilnadu							
48	Jsons Foundry Private Limited	0.225	28/10/2007	03/11/2007	Veppilankula	11:30 AM	English /Tamil
49	Jsons Foundry Private Limited	0.225	28/10/2007	03/11/2007	Veppilankula	11:30 AM	English /Tamil
50	Jsons Foundry Private Limited	0.225	28/10/2007	03/11/2007	Veppilankula	11:30 AM	English /Tamil
51	Jsons Foundry Private Limited	0.225	28/10/2007	03/11/2007	Veppilankula	11:30 AM	English /Tamil
52	Jsons Foundry Private Limited	0.225	28/10/2007	03/11/2007	Veppilankula	11:30 AM	English /Tamil
53	Jsons Foundry Private Limited	0.225	28/10/2007	03/11/2007	Veppilankula	11:30 AM	English /Tamil
54	Jsons Foundry Private Limited	0.225	28/10/2007	03/11/2007	Veppilankula	11:30 AM	English /Tamil
55	Western Percicast Pvt. Ltd.	0.225	28/10/2007	03/11/2007	Veppilankula	11:30 AM	English /Tamil
56	P.M.P. Textiles Spinning Mills Limited	0.50	24/07/2008	28/07/2008	Anthiyaur, Coimbatore	3:00 PM	English / Tamil
57	RCR Eco-Power	0.225	8/12/2008	15/12/2008	Veppilankulam	11:00 AM	Tamil / English
58	RCR Eco-Power	0.225	8/12/2008	15/12/2008	Veppilankulam	11:00 AM	Tamil / English
59	RCR Eco-Power	0.35	8/12/2008	19/12/2008	Myvadi	11:00 AM	Tamil / English
60	RCR Eco-Power	0.35	8/12/2008	19/12/2008	Myvadi	10:30 AM	Tamil / English
61	RCR Eco-Power	0.60	25/09/2008	3/10/2008	Kulayaneri	10:30 AM	Tamil / English
62	Shankarlal	0.225	25/01/2007	1/2/2007	Veppilankulam	10:30 AM	Tamil / English
63	B. S. C. Textiles	0.225	15/11/2006	21/11/2006	Veppilankulam	10:30 AM	Tamil / English
64	B. S. C. Textiles	0.225	15/11/2006	21/11/2006	Veppilankulam	10:30 AM	Tamil / English
65	B. S. C. Textiles	0.225	15/11/2006	21/11/2006	Veppilankulam	10:30 AM	Tamil / English
66	P. Vijaya Kumar	0.225	3/4/2006	13/04/2006	location no.1904	9:30 AM	Tamil / English
67	P. Vijaya Kumar	0.225	3/4/2006	13/04/2006	location no.1496	11:30 AM	Tamil / English
68	O. B. Agarwal	0.225	29/06/2007	5/7/2007	Veppilankulam	10:30 AM	Tamil / English
69	Radha-Mohan Processors	0.225	7/5/2007	12/5/2007	Veppilankulam	11:00 AM	Tamil / English
70	Swadeshi Dyeing	0.225	7/5/2007	12/5/2007	Veppilankulam	11:00	Tamil /

Sr. No.	Name of Project Promoter	Installed Capacity	Invitation letter send	Date of meeting	Venue	Time	Language for communication
	& Bleaching Mills Private. Limited					AM	English
71	B. S. Channabasappa & Sons	0.225	15/03/2006	27/03/2006	Veppilankulam	10:30 AM	Tamil / English
72	B. S. Channabasappa & Sons	0.225	15/03/2006	27/03/2006	Veppilankulam	10:30 AM	Tamil / English
73	B. S. Channabasappa & Sons	0.225	15/03/2006	27/03/2006	Veppilankulam	10:30 AM	Tamil / English
74	P. Mohan Lal	0.225	17/03/2006	22/03/2006	Location no.1740	10:30 AM	Tamil / English
75	P. Mohan Lal	0.225	17/03/2006	22/03/2006	Location no.1505	10:30 AM	Tamil / English
76	Operational Energy group India (P) Pvt Ltd (Previously: Dr. Santosh Prabhu)	0.225	17/03/2006	22/03/2006	Location no.1242	11:30 AM	Tamil / English
77	Operational Energy group India (P) Pvt Ltd (Previously: Dr. Santosh Prabhu)	0.225	17/03/2006	22/03/2006	Location no.1242	11:30 AM	Tamil / English
78	Mahalingashetty & Co. Ltd.	0.60	25.08.2008	29.08.2008	Rajampatti	11:30 AM	Tamil / English
79	Sri Venkatachalapathy Spinning Mills Pvt. Ltd.	0.75	02.06.2007	10.06.2007	Veeranam	10:00 AM	Tamil / English
80	Sri Venkatachalapathy Spinning Mills Pvt. Ltd.	0.75	02.06.2007	10.06.2007	Veeranam	10:00 AM	Tamil / English
81	Choudhary Exports	1.25	24.06.2009 (local newspaper)	24.06.2009	Ponnapuram CMS	11:00 AM	Tamil / English
82	Ramraj Handlooms	0.85	25.05.2007	06.06.2007	Karugulam	11:00 AM	Tamil / English
83	Ramraj Handlooms	0.75	27.05.2007	03.06.2007	Uthupalayam	4:30 PM	Tamil / English
84	Ramraj Handlooms	0.75	01.06.2006	06.06.2006	Azhagiapandiapuram	4:00 PM	Tamil / English
85	N. Sumati	0.25	24.05.2006	03.06.2006	Sellakarachal	11:30 AM	Tamil / English
86	K. R. Nagarajan	0.25	24.05.2006	03.06.2006	Sellakarachal	11:30 AM	Tamil / English
Gujarat							

Sr. No.	Name of Project Promoter	Installed Capacity	Invitation letter send	Date of meeting	Venue	Time	Language for communication
87	Air Control (India) Pvt. Ltd.	0.60	Local News paper used	16/01/2009	Village-Kuchhadi, Porbandar	10:00 AM	English
88	Badawe Engineers Pvt. Ltd.	0.60	Local News paper used	16/01/2009	Village-Kuchhadi, Porbandar	10:00 AM	English
89	Pragati Glass Pvt. Ltd.,	1.25	15/09/2008	26/09/2008	Village-Lamba, Bhuj	11:00 AM	English
90	Siddharth Infra Tech Pvt. Ltd	0.60	Published in local news paper dated 23/07/2008	25/07/2008	Village-Kuchhadi, Porbandar	12:00 PM	English
91	Agarwal Enterprises	0.60	11/7/2008	25.07.2008	Lamba	12:00 PM	English and Gujarati
92	Agarwal Enterprises	0.60	11/7/2008	25.07.2008	Lamba	12:00 PM	English and Gujarati
93	Unique Sugars Ltd.	1.50	Published in local news paper dated 21/07/2008	23.07.2008	Suthari	11:00 AM	English and Gujarati
94	Jaychandra Agro Industries Pvt. Ltd.	0.60	Published in local news paper dated 21/07/2008	23.07.2008	Suthari	11:00 AM	English and Gujarati
Rajasthan							
95	Shree Ram Hotels	0.35	Published in local news paper dated 18/04/2009	24.04.2009	Jaisalmer	11:00 AM	English and Hindi
96	Chhabra Syncotex Ltd.	0.60					
97	Chhabra Syncotex Ltd.	0.60					
98	Chhabra Syncotex Ltd.	0.35					
99	Sona Processors (India) Ltd.	0.35					
100	Delhi Rajasthan Transport Co. Ltd.	0.35					
101	Metro Cement and Mines Pvt. Ltd.	0.60					
102	Sarvodaya Suitings Ltd	0.35					
103	Sarvodaya Suitings Ltd	0.35					

Sr. No.	Name of Project Promoter	Installed Capacity	Invitation letter send	Date of meeting	Venue	Time	Language for communication
104	Free India Energy	1.25	23/05/2008	27/05/2008	Mada	11:00 AM	Hindi
Karnataka							
105	S C Shettar and Sons	1.25	23.12.2008	06.01.2009	Harogiri	3:30 PM	English and Kannad
106	Swarna Constructions	1.25	23.12.2008	06.01.2009	Harogiri	3:30 PM	English and Kannad
107	Suresh Kumar Sharma (HUF)	1.25	02.01.2009	02.01.2009	Harogiri	11:30 AM	English and Kannad
108	BEML Limited	1.25	08.12.2008	18.12.2008	Harogiri	11:30 AM	English and Kannad
109	BEML Limited	1.25	08.12.2008	18.12.2008	Harogiri	11:30 AM	English and Kannad
110	BEML Limited	1.25	08.12.2008	18.12.2008	Harogiri	11:30 AM	English and Kannad
111	BEML Limited	1.25	08.12.2008	18.12.2008	Harogiri	11:30 AM	English and Kannad

5.4 Public Comments

The local stakeholders appreciated local job creation, road construction and other benefits initiated due the project activity. Local stakeholders had no objections or negative comments relating to the project & regards best wishes to welcomes such activity.