

2nd Monitoring Report

Version - 01

17.45 MW Bundled Wind Power Project, India

Monitoring Period

2007-06-01 to 2008-05-31
(Including both days)

Submitted by

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2009-01-07

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1. Executive Summary

Electricity generated by project activity for the crediting period (01/06/2007 to 31/05/2008) = **26.467548 GWh**

Table No.1.1: Executive Summary of Vintage 2007-08.

Year	GWh Generation	Estimation of Project Activity Emissions (tonnes CO ₂ e /yr.)	Total Baseline Emissions (tonnes CO ₂ e /yr.)	Estimation of Leakage (tonnes CO ₂ e / yr.)	Estimation of Emission Reductions (tonnes CO ₂ e/yr.)
01/06/2007 to 31/05/2008	26.467548	0	24123	0	24123
Total		0	24123	0	24123

The project activity, as per the validation report is expected to be generating 41.38 GWh of electricity with 27.07 % of Plant load factor.

The project activity during this monitoring period has exported net electricity of 26.467548 GWh into the grid with 16.00% Plant load factor.

Year	Estimated Emission reductions	Claimed Emission Reductions
01/01/2007 to 31/12/2007	313624	15317
01/01/2008 to 31/05/2008		8806

The estimation of emission reductions in PDD were based on the electricity generation guarantee in WTG Purchase order by the technology supplier. Whereas the claimed emission reductions are calculated on the basis of Joint meter reading for electricity generation considering the losses & wind variation& hence the claimed emission reductions are lower than the estimated emission reductions.

2. Description of the Project Activity

The present bundled project activity deals with generation of electricity using wind energy by Wind Electric Generator (WEG). The installed capacity of the project is 17.45 MW located in Maharashtra, Rajasthan Karnataka and Tamilnadu states. This is a bundled project activity bringing together various small-scale VER projects to form a single project where the distinctive characteristics of each project activity have been retained.

2.1 Project Location

Location of Each Project is shown in the following table.

Table No. 2.1: Details of location for each project.

Ref. No.	Name of the Sponsor	Installed capacity (MW)	Unique Identification No.	Village	District	State	Gird emission factor
Mit/WP/01	Vindhya Spinning Mills Private Limited (VSMPL)	0.5	1955	Eladhur	Tirunelveli	Tamilnadu	0.930
		0.6	2044	Mangalam	Tirunelveli	Tamilnadu	0.930

Ref. No.	Name of the	Installed	Unique	Village	District	State	Gird
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	Sponsor	capacity (MW)	Identification No.				emission factor
Mit/WP/02	Rameshkumar Hanjarimal Rathod (RHR)	1.250	K-244	Kappathguda	Gadag	Karnataka	0.930
Mit/WP/03	Prima Papers & Engineering Pvt. Ltd (PPEPL)	0.250	1497	Kurungulum	Tirunelveli	Tamilnadu	0.930
		0.250	1498	Kurungulum	Tirunelveli	Tamilnadu	0.930
		0.250	1853	Pazahoor	Tirunelveli	Tamilnadu	0.930
		0.250	1854	Kurungulum	Tirunelveli	Tamilnadu	0.930
		0.250	1911	Kurungulum	Tirunelveli	Tamilnadu	0.930
Mit/WP/04	Rathi Dye Chem Pvt. Ltd. (RDCPL)	0.6	W-56	Garjewadi	Sangli	Maharashtra	0.905
Mit/WP/05	Sarvana Spinning Mills (SSM)	0.6	1053	Penagudi	Tirunelveli	Tamilnadu	0.930
Mit/WP/06	Kumaragiri Textiles Ltd. (KTL)	0.8	1061	Chinnaputhur	Tirunelveli	Tamilnadu	0.930
Mit/WP/07	Chhotabhai Jethabhai Patel & Co. (CJPC)	1.5	K-339	Gangapur	Nandurbar	Maharashtra	0.905
Mit/WP/08	Vijay S. Lodha (VSL)	0.6	K-315	Aichale	Nandurbar	Maharashtra	0.905
Mit/WP/09	M. J. Associates (MJA)	0.35	J-152	Jaisalmer	Jaisalmer	Rajasthan	0.889
Mit/WP/10	Adarsha Gaur Gum Udyog (AGGU)	0.35	J-154	Jaisalmer	Jaisalmer	Rajasthan	0.889
Mit/WP/11	Amar Associates (AA)	1.25	K-390	Dhandane	Nandurbar	Maharashtra	0.905
Mit/WP/12	Hermes Electronics Pvt. Ltd. (HEPL)	1.25	J-30	Phophade	Dhule	Maharashtra	0.905
Mit/WP/13	Raj Infrastructure Developers (RID)	1.25	J-131	Chhadvel	Dhule	Maharashtra	0.905
Mit/WP/14	Hotel Sheetal (HS)	1.25	J-085	Aichale	Nandurbar	Maharashtra	0.905
Mit/WP/15	P. R. Patil (PRP)	1.25	K-389	Mandal	Nandurbar	Maharashtra	0.905
		1.25	K-384	Gangapur	Nandurbar	Maharashtra	0.905
Mit/WP/16	Preetam Enterprises (PE)	0.6	W-14	Wagholi	Sangli	Maharashtra	0.905
Mit/WP/17	Shree Panchganga Agro Impex Pvt. Ltd. (SPA IPL)	0.6	W-13	Shelkewadi	Sangli	Maharashtra	0.905
Mit/WP/18	Fashion Apparels Pvt. Ltd. (FAPL)	0.35	J-364	Pohra	Jaisalmer	Rajasthan	0.889
Total		17.45					

Figure 1, Location of Wind Electric Generators

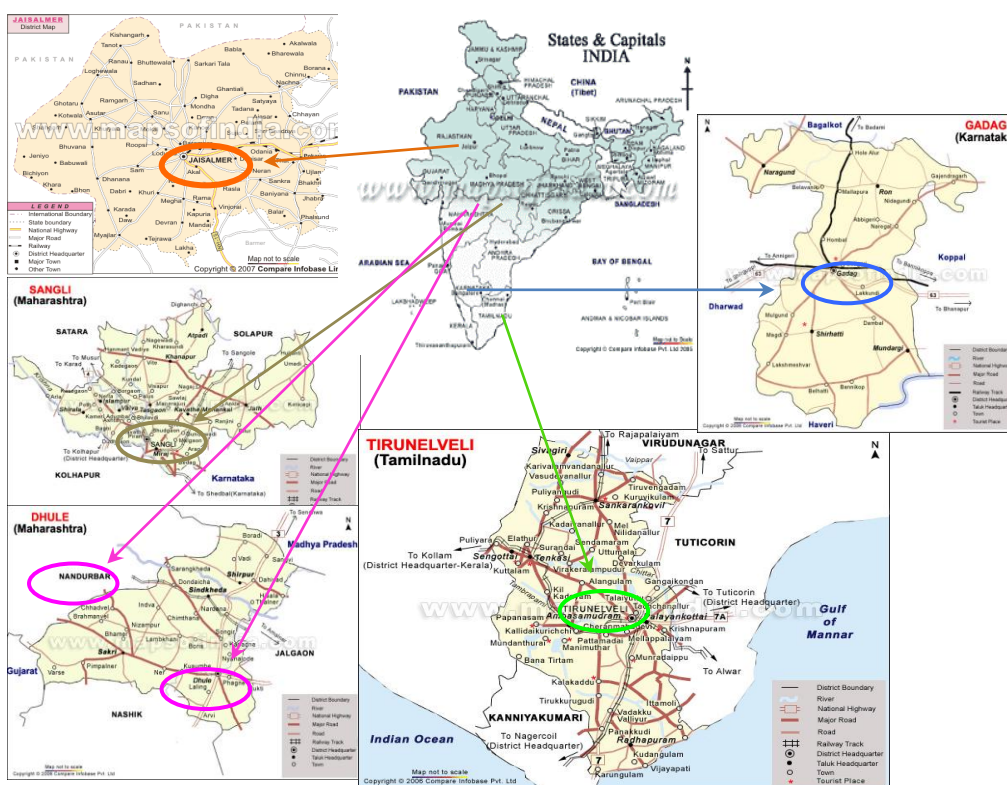
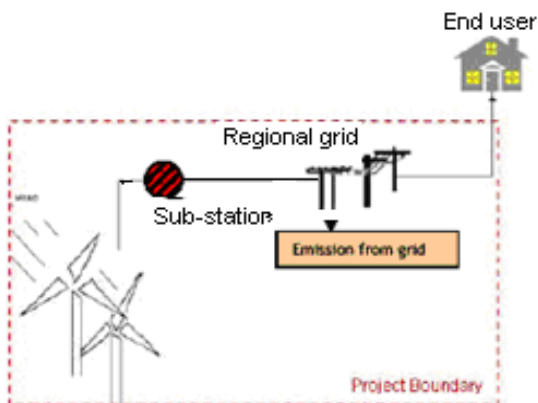


Table No. 2.2 : Geographical Location of Each District Where WEGs are Installed

District	Latitude	Longitude	Color code
Gadag (Karnataka)	14° 14' N	76° 24' E	Blue
Tirunelveli (Tamil Nadu)	08° 10' N	77° 26' E	Green
Sangli (Maharashtra)	16° 52' N	74° 34' E	Cyan
Dhule & Nandurbar (Maharashtra)	20° 54' N	74° 47' E	Purple
Jaisalmer (Rajasthan)	26° 55' N	70° 54' E	Orange

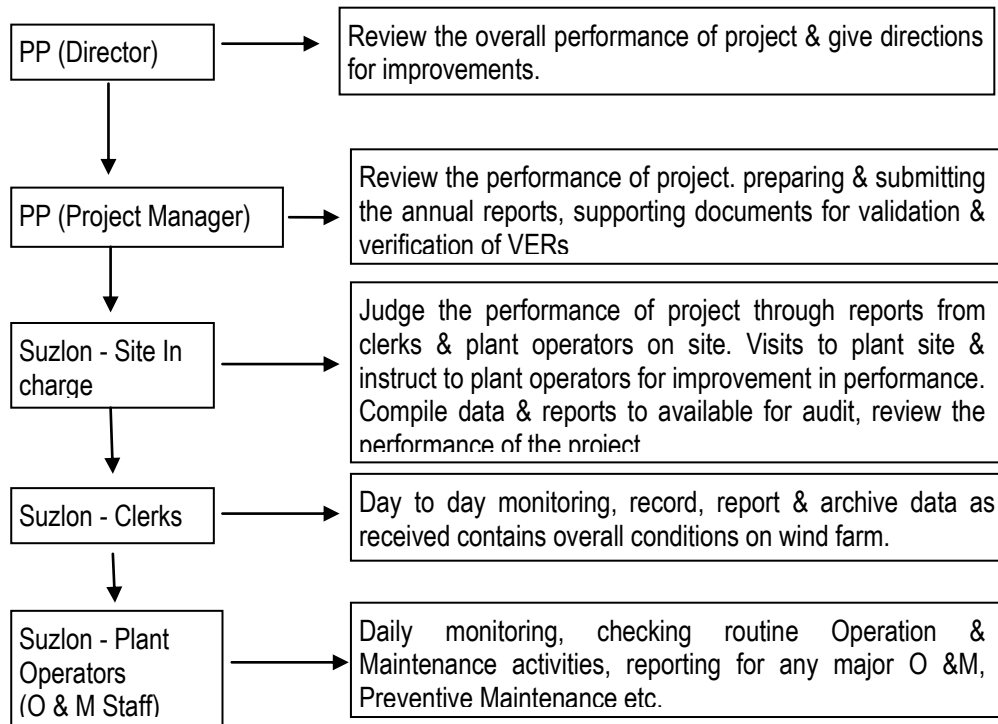
* Refer color codes in above table & map for identification of each project location.

2.2 Project Boundary



2.3 Roles and Responsibility

Table No. 2.3 : Roles and responsibilities of VER project team



- The primary recording of the electricity fed to the state utility grid will be carried out jointly at the incoming feeder of the state power utility. Machines for sale to utility will be connected to the feeder.
- The joint measurement will be carried out as per the section 11.02 of PPA. For plausible check of Main meter accuracy it is compared with Check meter. Further Joint Meter reading randomly crosschecked with monthly invoices.

For WEGs in this bundle, where single feeder connected with no. of WTGs meter apportioning procedure followed is as below-

Procedure for apportioning of electricity:

The gross generation of all 50 WTGs is G_G (Adding all controllers)

$$G_G = G_1 + G_2 + G_3 + \dots + G_{50} \text{ (Controller reading)}$$

The G_1 value we can get from respective WTG controller reading.

Let total gross export (G_{export}) of electricity in to grid by all WTGs connected to single Joint meter (main meter) measured at substation. Hence G_{export} is

$$G_{\text{export}} = G_{1 \text{ export}} + G_{2 \text{ export}} + G_{3 \text{ export}} + \dots + G_{50 \text{ export}}$$

The value of G_{export} can be available from Joint meter reading (Main meter) reported as per procedure mentioned in section 11.05 of PPA.

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

$$G_{\text{import}} = G_{1 \text{ import}} + G_{2 \text{ import}} + G_{3 \text{ import}} + \dots + G_{50 \text{ import}}$$

Hence, the WTG wise electricity generation ($G_{1 \text{ export}}$) breakup can be 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 can be derived as follows-
 $(G_{1 \text{ import}}) = (G_{\text{import}} \times G_1) / G_G$

Now we have both WTG wise electricity exported in to the grid ($G_{1 \text{ export}}$) & WTG wise electricity imported from the grid ($G_{1 \text{ import}}$).

Hence, the WTG wise net electricity generation ($G_{1 \text{ net export}}$) can be derived as follows-
 $(G_{1 \text{ net export}}) = G_{1 \text{ export}} - G_{1 \text{ import}}$

This net electricity generation ($G_{1 \text{ net export}}$) value is the basis for the billing purpose to state electricity utility & calculation of emission reduction.

- The secondary monitoring, which will provide a backup (fail-safe measure) in case the primary monitoring is not carried out, would be done at the individual WEGs. Each WEG is equipped with an integrated electronic meter. These meters are connected to the Central Monitoring Station (CMS) of the entire wind farm through a wireless Radio Frequency (RF) network (SCADA). The generation data & related parameters of individual machine can be monitored as a real-time entity at CMS. Suzlon gives each PP individual log in ID & Password to access the online status for his WTG, without which nobody can access the data.

Emergency preparedness procedures:

- The section 5.02 [b] of PPA mentions that PP have necessary protective arrangement / equipments and interlocking facilities which activates instantly (automatic/ manually) to tackle with emergency stated in PPA section 1.02 Y avoid damage to generating facility, public & material safety, state utility property.
- In case of WTG any force major necessary steps are taken within 24hrs to re- operation at normal level.
- During the operations and maintenance, the health safety kits, and first-aid-box with necessary medicines & ambulance facility are readily available for 24 hours to ensure safety of peoples.
- Fire extinguishers are provided in all areas and refilled before their expiry dates. An operation procedure for fire extinguisher is provided in each WTG & at CMS to ensure protection of State utility's equipments from severe damage.
- The List of Emergency contact no. are provided at each CMS in case of any emergency

3. Details of Sponsor

Table No. 3.1: Details of the project sponsors

Ref. No.	Name of the Sponsor	Installed Capacity (MW)	Unique Identification No.	Commissioning Date	Main Meter No.	Technology Used	WTG Location
Mit/WP/01	VSMPPL	0.5	1955	21/07/2006	04862902	VESTAS RRB V 39	Eladhur, Tirunelveli, Tamilnadu
		0.6	2044	28/09/2006	04804833	VESTAS RRB Pawanshakthi	Mangalam, Tirunelveli, Tamilnadu
Mit/WP/02	RHR	1.250	K-244	31/03/2006	05437940	SUZLON S 70	Kappathguda, Gadag, Karnataka

Ref. No.	Name of the Sponsor	Installed Capacity (MW)	Unique Identification No.	Commissioning Date	Main Meter No.	Technology Used	WTG Location
Mit/WP/03	PPEPL	0.250	1497	30/09/2005	04721867	CWEL 250 KW	Kurungulum, Tirunelveli, Tamilnadu
		0.250	1498	30/09/2005	04721868	CWEL 250 KW	Kurungulum, Tirunelveli, Tamilnadu
		0.250	1853	31/03/2006	TNB 01313	CWEL 250 KW	Pazahoor , Tirunelveli, Tamilnadu
		0.250	1854	31/03/2006	TNB 01314	CWEL 250 KW	Kurungulum , Tirunelveli, Tamilnadu
		0.250	1911	29/04/2006	TNB 01312	CWEL 250 KW	Kurungulum , Tirunelveli, Tamilnadu
Mit/WP/04	RDCPL	0.6	W-56	30/06/2006	04738054	SUZLON S 52	Garjewadi, Sangli, Maharashtra
Mit/WP/05	SSM	0.6	1053	29/12/2004	04668082	ENERCON E-40	Penagudi, Tirunelveli, Tamilnadu
Mit/WP/06	KTL	0.8	1061	31/12/2005	04901425	ENERCON E-48	Chinnaputhur, Tirunelveli, Tamilnadu
Mit/WP/07	CJPC	1.5	K-339	23/02/2007	04738079	SUZLON S 82	Gangapur, Nandurbar, Maharashtra
Mit/WP/08	VSL	0.6	K-315	30/09/2006	04725778	SUZLON S 52	Aichale, Dhule, Maharashtra
Mit/WP/09	MJA	0.35	J-152	29/03/2007	RJU02185	SUZLON S 33	Jaisalmer, Jaisalmer Rajasthan
Mit/WP/10	AGGU	0.35	J-154	29/03/2007	RJU02185	SUZLON S 33	Jaisalmer, Jaisalmer Rajasthan
Mit/WP/11	AA	1.25	K-390	11/5/2006	04725815	SUZLON S 70	Dhandane, Nandurbar, Maharashtra
Mit/WP/12	HEPL	1.25	J-30	29/03/2006	04738075	SUZLON S 70	Phophade, Dhule, Maharashtra
Mit/WP/13	RID	1.25	J-131	13/08/2006	04725791	SUZLON S 70	Chhadvel, Dhule, Maharashtra
Mit/WP/14	HS	1.25	J-085	29/09/2006	04725791	SUZLON S 70	Aichale, Dhule, Maharashtra
Mit/WP/15	PRP	1.25	K-389	26/09/2006	04725784	SUZLON S 70	Mandal, Nandurbar, Maharashtra
		1.25	K-384	1/11/2006	04738079	SUZLON S 70	Gangapur, Nandurbar, Maharashtra

Ref. No.	Name of the Sponsor	Installed Capacity (MW)	Unique Identification No.	Commissioning Date	Main Meter No.	Technology Used	WTG Location
Mit/WP/16	PE	0.6	W-14	31/07/2006	04738054	SUZLON S 52	Wagholi, Sangli, Maharashtra
Mit/WP/17	SPA IPL	0.6	W-13	31/03/2006	04738054	SUZLON S 52	Shelkewadi, Sangli, Maharashtra
Mit/WP/18	FAPL	0.35	J-364	30/03/2006	RJB00100	SUZLON S 33	Pohra, Jaisalmer, Rajasthan
	Total	17.45				--	--

There are 18 individual project participants. Information regarding each participant can be sourced from MITCON, at following centralized contact. MITCON is the consultant to the project.

Organization:	M/s MITCON Consultancy Services Ltd.
Street/P.O.Box:	Dr. Rajendra Prasad Road
Building:	Kubera Chambers
City:	Shivajinagar, Pune
State/Region:	Maharashtra
Postfix/ZIP:	411 005
Country:	India
Telephone:	020 – 2553 3309, 2553 4322
FAX:	020 – 2553 3206
E-Mail:	mitconmail@gmail.com
URL:	www.mitconindia.com
Represented by:	
Title:	Exec. Vice President
Salutation:	Mr.
Last Name:	Zade
Middle Name:	Madhukar
First Name:	Deepak
Department:	Energy & Carbon Services
Mobile:	09822684106
Direct FAX:	Not Available
Direct tel:	Not Available
Personal E-Mail:	deepak@mitconconsultancy.org

4. Sustainability Criteria

The present project contributes to sustainable development. Government of India has stipulated following indicators for sustainable development in the interim approval guidelines¹ for CDM projects.

4.1 Social well being:

- The project has resulted in the development of the region.

¹ Ministry of Environment and Forest web site: http://envfor.nic.in:80/divisions/ccd/cdm_iac.html

- During civil works, a lot of construction work took place, which generated employment for local people around the plant site.
- Other than these, there are various kinds of mechanical work, which has generated and will continue to generate employment opportunities on regular and permanent basis.

4.2 Economic well being:

- The project activity has generated employment in the local area.
- The project activity has led to good investment in a developing region which otherwise would not have happened in the absence of project activity.
- The generated electricity is fed into the regional grid through local grid, thereby improving the grid frequency and availability of electricity to the local consumers (villagers & sub-urban habitants) which 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 has also led to diversification of the national energy supply, which is dominated by conventional fuel based generating units.
- Use of renewable energy source (wind energy) also helps in conservation of natural resources (like coal) in the country.

4.3 Environmental well-being:

- The project utilizes wind energy for generating electricity which otherwise would have been generated through alternate fuels (fossil fuel) based power plants, contributing to reduction in specific emissions (emissions of pollutant/unit of energy generated) including GHG emissions.
- As wind power project produce no end products in the form of waste (Particulate Matter, Fly ash, Water effluent etc.). They address the problem of waste treatment & waste disposal encountered by thermal power stations.
- Being a renewable resource, using wind energy to generate electricity contributes to resource conservation.
- The project contributes to the economic sustainability around the plant site, which is promotion of decentralization of economic power.
- Thus the project causes no negative impact on the surrounding environment contributing to environmental well being.

4.4 Technological well being:

- The project activity leads to the promotion of variety of technologies of Wind Turbine Generators (WTGs) in the subcontinent, demonstrating the success of various types of wind turbines, which feed the generated power into the nearest sub-station. Thus increasing energy availability and improving quality of power under the service area of the substation.

In view of the above, the project participants consider that the project activity profoundly contributes to the sustainable development.

5. Monitoring Methodology and Monitoring Plan

Monitoring Methodology

According to the UNFCCC Guidelines the following monitoring methodology is applicable for the present project:

Project Type : I – Renewable Energy Projects

Revision to the approved consolidated methodology ACM0002.

“Consolidated monitoring methodology for zero-emission grid connected electricity generation from renewable sources’ ACM0002 (Version 6: 19 May 2006) is applicable for the following project activity.

Also VCS 2007.1 monitoring method is referred.

Monitoring Plan

For RDPL, CJPC, VSL, MJA, AGGU, AA, HEPL, RID, HS, PRP, PE, SPAIPL, FAPL the monitoring was done as per the table below:

Data / Parameter:	EGy
Data unit:	KWh
Description:	Electricity supplied to the grid by the project. Net Electricity export by the project annually (obtained from joint meter reading by Regional electricity board and project promoter on monthly basis). Note: Net Electricity Export to grid = Electricity export to grid – Electricity import from grid – Electricity Losses, if any (Transmission and Distribution losses)
Source of data to be used:	Measured & calculated
Value of data applied for the purpose of calculating expected emission reductions	--
Description of measurement methods and procedures to be applied:	Monitoring: trivector meter will be used for monitoring <u>Data Type</u> : measured <u>Frequency</u> : hourly measured <u>Recording</u> : Monthly from joint meter <u>Archiving Policy</u> : Paper & Electronic <u>Responsibility</u> : Project Head would be responsible for regular calibration of the meter. <u>Calibration Frequency</u> : Once a year or in compliance with PPA guidelines or CEA's, Govt. of India guidelines or with UNFCCC guidelines.
QA/QC procedures to be applied:	The project revenue is based on the net units displaced as measured by main metering system installed at the interconnection point at substation. Other than main meter, the project proponent has check meter so that the accuracy of main meter can be verified. The calibration of the meters will be done periodically by state electricity utility. Other than periodic calibration of the meters, the reading of both meters will be matched every month. The net electricity

	exported to the grid can be cross verified with randomly with invoices raised by PP on monthly basis against sell of generated electricity units.
Any comment:	Data will be archived during the whole crediting period + 2 years or of the last issuance of VERs for this project activity, whichever occurs later

For the VSMPL, RHR, PPEPL, SSM, KTL WEGs the monitoring was done as per the table below:

Data / Parameter:	EGy
Data unit:	KWh
Description:	Electricity supplied to the grid by the project. Net Electricity export by the project annually (obtained from joint meter reading by Regional electricity board and project promoter on monthly basis). Note: Net Electricity Export to grid = Electricity export to grid – Electricity import from grid – Electricity Losses, if any (Transmission and Distribution losses)
Source of data to be used:	Measured
Value of data applied for the purpose of calculating expected emission reductions	--
Description of measurement methods and procedures to be applied:	Monitoring: trivector meter will be used for monitoring <u>Data Type</u> : measured <u>Frequency</u> : hourly measured <u>Recording</u> : Monthly from joint meter <u>Archiving Policy</u> : Paper & Electronic <u>Responsibility</u> : Project Head would be responsible for regular calibration of the meter. <u>Calibration Frequency</u> : Once a year or in compliance with PPA guidelines or CEA's, Govt. of India guidelines or with UNFCCC guidelines.
QA/QC procedures to be applied:	The project revenue is based on the net units displaced as measured by main metering system installed at the interconnection point at substation. Other than main meter, the project proponent has check meter so that the accuracy of main meter can be verified. The calibration of the meters will be done periodically by state electricity utility. Other than periodic calibration of the meters, the reading of both meters will be matched every month. The net electricity exported to the grid can be cross verified with randomly with invoices raised by PP on monthly basis against sell of generated electricity units.
Any comment:	Data will be archived during the whole crediting period + 2 years or of the last issuance of VERs for this project activity, whichever occurs later

Monitoring Organization(s)

Monitoring was done with necessary equipments on intervals mentioned in the methodology adopted for the project activity. The calibration of monitoring equipment is being done with calibration standards as per the state electricity boards (SEBs), national standard and the same is being done as per schedule. All monitoring parameter being recorded and being verified by the responsible authorities & documents are maintained by the project participants for record purpose.

6. Measures to insure the Accuracy of Results

Following measures are taken to ensure accuracy of readings & the calculations based there on.

- The Main Meter & Check Meter instruments used on the sites are calibrated periodically as per the PPA, UNFCCC, CEA guidelines, sealed and maintained in good working condition. Respective staff employed maintains records for all the monitored parameters.
- The Main meter is the basis of billing by state electricity board to project participant. [Note - If any promoter unable to carry out the calibration, the emission reductions are reduced as the 32nd meeting of CDM-Meth Panel annex 14, Table - 4 Acceptable uncertainty limits for random uncertainty (adapted from 2006 IPCC guidelines, Volume 2 chapter 2, Table 2.2 - 2.6)]

7. VER (Voluntary Emission Reduction) Calculations

The project activity is a wind energy project that supplies electricity to state grid. Since wind is a renewable resource, the GHG emissions from the project activity are zero.

The project is of 17.45 MW total installed capacity, hence this is a small-scale CDM project and the Simplified M & P for large-Scale CDM Project Activity, Category I. and 'Consolidated baseline methodology for grid connected electricity generation from renewable sources'. (version 6 : 19 May 2006) is applicable. The applicable project activity is grid connected electricity generation from renewable energy sources. There are a number of different sizes and sub types of this project activity (run- of- river hydro power plants; hydro power projects with existing reservoirs where the volume of the reservoir is not increased, wind, geothermal, solar sources, tidal, wave).

Baseline methodology for projects under Type I. "Consolidated baseline methodology for grid connected electricity generation from renewable sources". (version 6 : 19 May 2006) is applicable. This methodology states that for the project activities that do not modify or retrofit an existing electricity generation facility, the baseline scenario is the following:

Electricity delivered to the grid by the project 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) calculation described in PDD.

Baseline emission factor (EF_y)

The baseline emission factor EF_y is calculated as a combine margine (CM) consisting of the combination of operating margine (OM) and build margin (BM) factors according to the following three steps. Calculations for this combined margin must be based on data from an official source (where available) and made publically available.

Weighted average of the simple operating margin emission factor ($EF_{OM,y}$) and the build margin emission factor ($EF_{BM,y}$), where for wind and solar projects, the default weights are as follows: $W_{OM}= 0.75$ and $W_{BM}=0.25$ (owing to their intermittent and non-dispatchable

nature) are calculated as described in Steps 1 and 2 of consolidated methodology ACM0002 (Version 6 : 19 May 2006) and are expressed in tCO₂/MWh.

$$EF_{GRID,y} = 0.75 \times EF_{OM,y} + 0.25 \times EF_{BM,y}$$

$$BE_y = EG_y \times EF_y$$

Where:

EG_y - is the net quantity of electricity generated by the project in year y, and
EF_y – is the combine margin carbon emission factor of the grid

In the proposed baseline, Western, Southern and Northern Regional grids are used as the reference region for estimating the current generation mix. Using the methodology available for small-scale project activities, the Combined Margin Emissions (in tCO₂ e/MWh) of current generation mix of Western, Southern and Northern Regional grids of India is used for the calculation of baseline. Actual CO₂ emission factor are used for the purpose.

Table No. 7.1, Information is Used for Baseline Determination

Sr. No.	Key information/data used for baseline	Source of data/information
1.	Electricity Generated	Electricity generation report/ credit note by state utility on monthly basis
2.	Western Regional Grid	CO ₂ Baseline Database for the Indian Power Sector, User Guide, Version 2.0, (21 st June 2007) Central Electricity Authority, Govt. of India (Refer Annexure –I)
3.	Southern Regional Grid	
4.	Northern Regional Grid	

As per the methodology leakage estimation or consideration for electricity generation through renewable sources of energy is not to required.

Grid Emission Factor

Western Regional Grid – 0.905 t CO₂/MWh
Southern Regional Grid - 0.930 t CO₂/MWh
Northern Regional Grid – 0.889 t CO₂/MWh

Baseline emissions or VERs generated by the project are estimated to be:

$$\text{Baseline Emissions}_{(\text{project})} \text{ (tons of CO}_2\text{)} = \text{Grid Emission Factor} \text{ (tons of CO}_2\text{/MWh)} * \text{Power Generated from the Project} \text{ (MWh/year)}$$

8. Monthly Operating Data-

Mit/WP/01 Table 1.1, Vindhya Spinning Mills Private Limited			
Installed capacity: 0.5 MW, H.T.S.C. No. 1955			
Commissioning Date : 21/07/2006			
Month	2007	2008	Total VERs
January		18726	
February		10577	
March		8995	
April		14345	
May		120278	
June	161948		
July	90453		
August	189204		
September	168414		
October	143028		
November	26826		
December	10642		
Total	790515	172921	963436
Southern Region Grid Emission Factor t CO₂/MWh	0.930	0.930	
tCO₂e reduction	735.2	160.8	896.0
tCO₂e reduction			895.0

Mit/WP/01 Table 1.2, Vindhya Spinning Mills Private Limited			
Installed capacity: 0.6 MW H.T.S.C. No. 2044			
Commissioning Date : 28/09/2006			
Month	2007	2008	Total VERs
January		5926	
February		5702	
March		6714	
April		14611	
May		155260	
June	159287		
July	113677		
August	198221		
September	198308		
October	130271		
November	24768		
December	-297		
Total	824235	188213	1012448
Southern Region Grid Emission Factor t CO₂/MWh	0.930	0.930	
tCO₂e reduction	766.5	175.0	941.6
tCO₂e reduction			941.0

Mit/WP/02 Table 2, Rameshkumar Hanjarimal Rathod			
Installed capacity: 1.25 MW K-244			
Commissioning Date : 31/03/2006			
Month	2007	2008	Total VERs
January		91770.6	
February		39431.2	
March		72623.2	
April		114410.4	
May		280938.8	
June	402450		
July	486320		
August	426475		
September	326724.4		
October	84606.5		
November	84276.4		
December	106825.6		
Total	1917677.9	599174.2	2516852
Southern Region Grid Emission Factor t CO₂/MWh	0.930	0.930	
tCO₂e reduction	1783.4	557.2	2340.7
tCO₂e reduction			2340.0

Mit/WP/03 Table 3.1, Prima Papers & Engineering Private Ltd.			
Installed capacity: 0.25 MW H.T.S.C. No. 1497			
Commissioning Date : 30/09/2005			
Month	2007	2008	Total VERs
January		29336.0	
February		-688.0	
March		-496.0	
April		-556.0	
May		-536.0	
June	23104		
July	31268		
August	43964		
September	33764		
October	33136		
November	10020		
December	22352		
Total	197608	27060.0	224668
Southern Region Grid Emission Factor t CO₂/MWh	0.930	0.930	
tCO₂e reduction	183.8	25.2	208.9
tCO₂e reduction			208.0

Mit/WP/03 Table 3.2, Prima Papers & Engineering Private Ltd.			
Installed capacity: 0.25 MW H.T.S.C. No. 1498			
Commissioning Date : 30/09/2005			
Month	2007	2008	Total VERs
January		35756.0	
February		26712.0	
March		11408.0	
April		672.0	
May		32488.0	
June	29316		
July	27096		
August	49096		
September	37604		
October	34320		
November	8280		
December	21728		
Total	207440	107036.0	314476
Southern Region Grid Emission Factor t CO₂/MWh	0.930	0.930	
tCO₂e reduction	192.9	99.5	292.5
tCO₂e reduction			291.0

Mit/WP/03 Table 3.3, Prima Papers & Engineering Private Ltd.			
Installed capacity: 0.25 MW H.T.S.C. No. 1853			
Commissioning Date : 31/03/2006			
Month	2007	2008	Total VERs
January		36084.0	
February		27020.0	
March		19080.0	
April		2420.0	
May		35660.0	
June	26072		
July	40040		
August	47676		
September	38928		
October	38932		
November	11212		
December	20496		
Total	223356	120264.0	343620
Southern Region Grid Emission Factor t CO₂/MWh	0.930	0.930	
tCO₂e reduction	207.7	111.8	319.6
tCO₂e reduction			318.0

Mit/WP/03 Table 3.4, Prima Papers & Engineering Private Ltd.			
Installed capacity: 0.25 MW H.T.S.C. No. 1854			
Commissioning Date : 31/03/2006			
Month	2007	2008	Total VERs
January		38184.0	
February		26872.0	
March		18452.0	
April		2220.0	
May		34804.0	
June	24144		
July	29800		
August	40220		
September	33800		
October	32068		
November	8400		
December	20852		
Total	189284	120532.0	309816
Southern Region Grid Emission Factor t CO₂/MWh	0.930	0.930	
tCO₂e reduction	176.0	112.1	288.1
tCO₂e reduction			288.0

Mit/WP/03 Table 3.5, Prima Papers & Engineering Private Ltd.			
Installed capacity: 0.25 MW H.T.S.C. No. 1911			
Commissioning Date : 29/04/2006			
Month	2007	2008	Total VERs
January		41144.0	
February		32760.0	
March		29164.0	
April		5020.0	
May		39764.0	
June	45552		
July	40176		
August	44668		
September	42200		
October	44308		
November	11088		
December	23908		
Total	251900	147852.0	399752
Southern Region Grid Emission Factor t CO₂/MWh	0.930	0.930	
tCO₂e reduction	234.3	137.5	371.77
tCO₂e reduction			371.00

Mit/WP/04 Table 4, Rathi Dye Chem Pvt. Ltd.			
Installed capacity: 0.6 MW W-56			
Commissioning Date : 30/06/2006			
Month	2007	2008	Total VERs
January		38553.1	
February		28847.4	
March		0.0	
April		14546.4	
May		151123.8	
June	196220.6		
July	232664.0		
August	226237.5		
September	156372.7		
October	30669.2		
November	34832.0		
December	29434.5		
Total	906430.5	233071	1139501
Western Region Grid Emission Factor t CO₂/MWh	0.905	0.905	
tCO₂e reduction	820.3	210.9	1031.25
tCO₂e reduction			1030.00

Mit/WP/05 Table 5, Sarvana Spinning Mills			
Installed capacity: 0.6 MW H.T.S.C. No. 1053			
Commissioning Date : 29/12/2004			
Month	2007	2008	Total VERs
January		92056.0	
February		40656.0	
March		57814.0	
April		26427.0	
May		180635.0	
June	173945		
July	80805		
August	165830		
September	150402		
October	117991		
November	42270		
December	71710		
Total	802953	397588.0	1200541
Southern Region Grid Emission Factor t CO₂/MWh	0.930	0.930	
tCO₂e reduction	746.7	369.8	1116.50
tCO₂e reduction			1115.00

Mit/WP/06 Table 6, Kumaragiri Textiles Ltd.			
Installed capacity: 0.8 MW H.T.S.C. No. 1061			
Commissioning Date : 31/12/2005			
Month	2007	2008	Total VERs
January		7027.0	
February		9206.0	
March		15278.0	
April		24746.0	
May		108738.0	
June	201465		
July	293899		
August	297674		
September	269284		
October	237845		
November	24727		
December	8348		
Total	1333242	164995.0	1498237
Southern Region Grid Emission Factor t CO₂/MWh	0.930	0.930	
tCO₂e reduction	1239.9	153.4	1393.36
tCO₂e reduction			1392.00

Mit/WP/07 Table 7, Chhotabhai Jethabhai Patel & Co.			
Installed capacity: 1.5 MW K-339			
Commissioning Date : 23/02/2007			
Month	2007	2008	Total VERs
January		93091.0	
February		132336.0	
March		189979.0	
April		382495.0	
May		734341.0	
June	473489		
July	500412		
August	486065		
September	269892		
October	103221		
November	23799		
December	71796		
Total	1928674	1532242.0	3460916
Western Region Grid Emission Factor t CO₂/MWh	0.905	0.905	
tCO₂e reduction	1745.4	1386.7	3132.13
tCO₂e reduction			3131.00

Mit/WP/08 Table 8, Vijay S. Lodha			
Installed capacity: 0.6 MW K-315			
Commissioning Date : 30/09/2006			
Month	2007	2008	Total VERs
January		19940.0	
February		27414.0	
March		45382.0	
April		109159.0	
May		243776.0	
June	0		
July	0		
August	15505		
September	48242		
October	26657		
November	1256		
December	7674		
Total	99334	445671.0	545005
Western Region Grid Emission Factor t CO₂/MWh	0.905	0.905	
tCO₂e reduction	89.9	403.3	493.23
tCO₂e reduction			492.00

Mit/WP/09 Table 9, M J Associates			
Installed capacity: 0.35 MW J-152			
Commissioning Date : 29/03/2007			
Month	2007	2008	Total VERs
January		36654.0	
February		18629.0	
March		41569.0	
April		29108.0	
May		94521.0	
June	74087		
July	71462		
August	66129		
September	37583		
October	17349		
November	9163		
December	25471		
Total	301244	220481.0	521725
Northern Region Grid Emission Factor t CO₂/MWh	0.889	0.889	
tCO₂e reduction	267.8	196.0	463.81
tCO₂e reduction	267	196	463.00

Mit/WP/10 Table 10, Adarsha Gaur Gum Udyog			
Installed capacity: 0.35 MW J-154			
Commissioning Date : 29/03/2007			
Month	2007	2008	Total VERs
January		35416.0	
February		17306.0	
March		38588.0	
April		29352.0	
May		88380.0	
June	72080		
July	62381		
August	57049		
September	32799		
October	15871		
November	8937		
December	25038		
Total	274155	209042.0	483197
Northern Region Grid Emission Factor t CO₂/MWh	0.889	0.889	
tCO₂e reduction	243.7	185.8	429.56
tCO₂e reduction			428.00

Mit/WP/11 Table 11, Amar Associates			
Installed Capacity: 1.25 MW K - 390			
Commissioning Date : 11/05/2006			
Month	2007	2008	Total VERs
January		53364.0	
February		73439.0	
March		116651.0	
April		239231.0	
May		544627.0	
June	233383		
July	301528		
August	308499		
September	125491		
October	60644		
November	12957		
December	37031		
Total	1079533	1027312	2106845
Western Region Grid Emission Factor t CO₂/MWh	0.905	0.905	
tCO₂e reduction	977.0	929.7	1906.69
tCO₂e reduction			1905.00

Mit/WP/12 Table 12, Hermes Electronics Pvt. Ltd.			
Installed capacity: 1.25 MW J-30			
Commissioning Date : 29/03/2006			
Month	2007	2008	Total VERs
January		35352.0	
February		39294.0	
March		45157.0	
April		110866.0	
May		335691.0	
June	0		
July	0		
August	126151		
September	64548		
October	27097		
November	7985		
December	20147		
Total	245928	566360	812288
Western Region Grid Emission Factor t CO₂/MWh	0.905	0.905	
tCO₂e reduction	222.6	512.6	735.12
tCO₂e reduction			734.00

Mit/WP/13 Table 13, Raj Infrastructure Developers			
Installed capacity: 1.25 MW J - 131			
Commissioning Date : 13/08/2006			
Month	2007	2008	Total VERs
January		67238.0	
February		83378.0	
March		109092.0	
April		212405.0	
May		514122.0	
June	298624		
July	321461		
August	303510		
September	123827		
October	61095		
November	24492		
December	50388		
Total	1183397	986235	2169632
Western Region Grid Emission Factor t CO₂/MWh	0.905	0.905	
tCO₂e reduction	1071.0	892.5	1963.52
tCO₂e reduction			1962.00

Mit/WP/14 Table 14, Hotel Sheetal			
Installed capacity: 1.25 MW J - 085			
Commissioning Date : 29/09/2006			
Month	2007	2008	Total VERs
January		43657.0	
February		57012.0	
March		81504.0	
April		170405.0	
May		402403.0	
June	0		
July	0		
August	199612		
September	89327		
October	47902		
November	10187		
December	22817		
Total	369845	754981.0	1124826
Western Region Grid Emission Factor t CO₂/MWh	0.905	0.905	
tCO₂e reduction	334.7	683.3	1017.97
tCO₂e reduction			1017.00

Mit/WP/15 Table 15.1, P. R. Patil			
Installed capacity: 1.25 MW K - 389			
Commissioning Date : 26/09/2006			
Month	2007	2008	Total VERs
January		37585.0	
February		55450.0	
March		76443.0	
April		168293.0	
May		417338.0	
June	54265		
July	240900		
August	226166		
September	80345		
October	36693		
November	9615		
December	23232		
Total	671216	755109.0	1426325
Western Region Grid Emission Factor t CO₂/MWh	0.905	0.905	
tCO₂e reduction	607.5	683.4	1290.82
tCO₂e reduction			1290.00

Mit/WP/15 Table 15.2, P. R. Patil			
Installed capacity: 1.25 MW K-384			
Commissioning Date : 01/11/2006			
Month	2007	2008	Total VERs
January		56606.0	
February		77762.0	
March		124163.0	
April		NA	
May		NA	
June	280146		
July	312472		
August	294567		
September	134169		
October	66816		
November	13706		
December	34556		
Total	1136432	258531.0	1394963
Western Region Grid Emission Factor t CO₂/MWh	0.905	0.905	
tCO₂e reduction	1028.5	234.0	1262.44
tCO₂e reduction			1261.00

Mit/WP/16 Table 16, Preetam Enterprises			
Installed capacity: 0.6 MW W- 14			
Commissioning Date : 31/07/2006			
Month	2007	2008	Total VERs
January		0.0	
February		29499.9	
March		46891.6	
April		83532.2	
May		130534.2	
June	183324.3		
July	208946.5		
August	200603.9		
September	139699.5		
October	33165.9		
November	37221.8		
December	32966.1		
Total	835928	290458	1126386
Western Region Grid Emission Factor t CO₂/MWh	0.905	0.905	
tCO₂e reduction	756.5	262.9	1019.38
tCO₂e reduction			1018.00

Mit/WP/17 Table 17, Shree Panchganga Agro Impex Pvt. Ltd.			
Installed capacity: 0.6 MW W - 13			
Commissioning Date : 31/03/2006			
Month	2007	2008	Total VERs
January		41970.0	
February		6445.2	
March		0.0	
April		15162.4	
May		128135.1	
June	164752.0		
July	181284.2		
August	165757.6		
September	118671.8		
October	34408.3		
November	38153.4		
December	36689.2		
Total	739717	191713	931429
Western Region Grid Emission Factor t CO₂/MWh	0.905	0.905	
tCO₂e reduction	669.4	173.5	842.94
tCO₂e reduction			842.00

Mit/WP/18 Table 18, Fashion Apparels Pvt. Ltd.			
Installed capacity: 0.35 MW J- 364			
Commissioning Date : 30/03/2006			
Month	2007	2008	Total VERs
January		21159.0	
February		14001.0	
March		32804.0	
April		26645.0	
May		86501.0	
June	75943		
July	62013		
August	55735		
September	31812		
October	13751		
November	6085		
December	14215		
Total	259554	181110.0	440664
Northern Region Grid Emission Factor t CO₂/MWh	0.889	0.889	
tCO₂e reduction	230.7	161.0	391.75
tCO₂e reduction			391.00

Annexure – I

CO₂ Baseline Database for the Indian Power Sector User Guide, Version 2.0 (21st December 2006)
Central Electricity Authority, Government of India.

Weighted Average Emission Rate (tCO₂/MWh) (incl. Imports)

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
North	0.72	0.73	0.74	0.71	0.72	0.72
East	1.09	1.03	1.09	1.08	1.05	1.05
South	0.74	0.75	0.82	0.84	0.78	0.74
West	0.90	0.92	0.90	0.90	0.92	0.88
North-East	0.42	0.41	0.40	0.43	0.48	0.33
India	0.82	0.83	0.85	0.85	0.84	0.81

Simple Operating Margin (tCO₂/MWh) (incl. Imports)

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
North	0.98	0.98	1.00	0.9871	0.9758	0.9946
East	1.22	1.19	1.17	1.1959	1.1745	1.1255
South	1.03	1.00	1.01	1.0041	0.9999	1.0073
West	0.98	1.01	0.98	0.9903	1.0120	0.9934
North-East	0.73	0.71	0.74	0.7366	0.8402	0.6994
India	1.01	1.02	1.02	1.02	1.02	1.02

Build Margin (tCO₂/MWh) (not adjusted for imports)

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
North					0.53	0.6005
East					0.90	0.9672
South					0.7089	0.7113
West					0.7700	0.6300
North-East					0.15	0.1489
India					0.70	0.68

Annexure - II

Summary Information of WTGs & respective ERs

S. No	Project promoter	Capacity (MW)	Commissioning Date	Survey No	Unique No.	Village	District	State	Emission Reductions
1	Vindhya Spinning Mills Private Limited	0.5	21/07/2006	582/4,5,6(P), 7(P) & 11(P)	1955	Eladhur	Tirunelveli	Tamilnadu	895
		0.6	28/09/2006	58/4 (P) & 58/5 (P)	2044	Mangalam	Tirunelveli	Tamilnadu	941
2	Rameshkumar Hanjarimal Rathod	1.25	31/03/2006	244/20,	K-244	Kappathguda	Gadag	Karnataka	2340
3	Prima Papers & Engineering Pvt. Ltd	0.25	30/09/2005	499/2DP	1497	Kurungulum	Tirunelveli	Tamilnadu	208
		0.25	30/09/2005	681/1F3, 1G	1498	Kurungulum	Tirunelveli	Tamilnadu	291
		0.25	31/03/2006	463/1A, 3S	1853	Pazahoor	Tirunelveli	Tamilnadu	318
		0.25	31/03/2006	465/1, 466	1854	Kurungulum	Tirunelveli	Tamilnadu	288
		0.25	29/04/2006	409/8(P), 391 (P)	1911	Kurungulum	Tirunelveli	Tamilnadu	371
4	Rathi Dye Chem Pvt. Ltd	0.6	30/06/2006	Gut No-137/P	W-56	Garjewadi	Sangli	Maharashtra	1030
5	Sarvana Spinning Mills	0.6	29/12/2004	SF-503/1&2	1053	Penagudi	Tirunelveli	Tamilnadu	1115
6	Kumaragiri Textiles Ltd	0.8	31/12/2005	SF-718/4	1061	Chinnaputhur	Tirunelveli	Tamilnadu	1392
7	Chhotabhai Jethabhai Patel & Co	1.5	23/02/2007	RS-72	K-339	Gangapur	Nandurbar	Maharashtra	3131
8	Vijay S. Lodha	0.6	30/09/2006	RS-55	K-315	Aichale	Nandurbar	Maharashtra	492
9	M J Associates	0.35	29/03/2007	J-152		Jaisalmer	Jaisalmer	Rajasthan	463
10	Adarsha Gaur Gum Udyog	0.35	29/03/2007	J-154		Jaisalmer	Jaisalmer	Rajasthan	428
11	Amar Associates	1.25	11/05/2006	Gut No-27/P	K-390	Dhandane	Nandurbar	Maharashtra	1905
12	Hermes Electronics Pvt. Ltd.	1.25	29/03/2006	RS - 46	J-30	Phophade	Dhule	Maharashtra	734
13	Raj Infrastructure Developers	1.25	13/08/2006	RS - 90	J-131	Chhadvel	Dhule	Maharashtra	1962
14	Hotel Sheetal	1.25	29/09/2006	RS-264	J-085	Aichale	Nandurbar	Maharashtra	1017
15	P. R. Patil	1.25	26/09/2006	RS-170	K-389	Mandal	Nandurbar	Maharashtra	1290
		1.25	01/11/2006	RS-120	K-384	Gangapur	Nandurbar	Maharashtra	1261
16	Preetam Enterprises	0.6	31/07/2006	RS-54	W-14	Wagholi	Sangli	Maharashtra	1018
17	Shree Panchganga Agro Impex Pvt. Ltd	0.6	31/03/2006	RS-97	W-13	Shelkewadi	Sangli	Maharashtra	842
18	Fashion Apparels Pvt. Ltd.	0.35	30/03/2006	J-364		Pohra	Jaisalmer	Rajasthan	391
	Total	17.45							24123