CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-SSC-PDD)
Version 03 - in effect as of: 22 December 2006

CONTENTS

Revision history of this document

Version Number	Date	Description and reason of revision
01	21 January 2003	Initial adoption
02	8 July 2005	• The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document. • As a consequence, the guidelines for completing CDM SSC PDD have been revised accordingly to version 2. The latest version can be found at <http://cdm.unfccc.int/Reference/Documents>.
03	22 December 2006	• The Board agreed to revise the CDM project design document for small-scale activities (CDM-SSC-PDD), taking into account CDM-PDD and CDM-NM.

SECTION A. General description of small-scale project activity

A.1 Title of the small-scale project activity:

3.00 MW bundled Wind Power Project by Shree Jai Ambe Associates at Brahmanvel, Dist. Dhule (Maharashtra), India.

Version: 07
Dated: 03/04/2009

A.2. Description of the small-scale project activity:

The project consists of implementation of 3.00 MW windmill farm at Brahmanvel in Dhule district.

This promoted project is a bundled project by 'Shree Jai Ambe Associates (Power Division)'. They are the traders & exporter of Rice in many parts of India. Well established in the field of Poultry farming, Warehousing and Rice Milling. Also generate wind power energy.
The bundled project activity consists of 4 bundles:

- Bundle I: 0.750 MW windmill by Shree Jai Ambe Associates (Power Division).
- Bundle II: 0.750 MW windmill by Automotive Valves Pvt. Ltd.
- Bundle III: 0.750 MW windmill by M.G. Patel & Brothers (Power Division).
- Bundle IV: 0.750 MW windmill by Gayson & Company Pvt. Ltd.

All windmills are installed at village Brahmanvel of district Dhule in state of Maharashtra, India.

Details of individual windmills installed in project are as given in following table:

Sr. No.	Capacity of Windmill[1]	Starting Date of Installation Work[2]	Date of Commissioning[3]
1.	0.750 MW	02/11/2006	23/01/2007
2.	0.750 MW	02/11/2006	23/01/2007
3.	0.750 MW	02/11/2006	23/01/2007
4.	0.750 MW	02/11/2006	23/01/2007

To fulfil their commitment towards sustainable development and a cleaner environment the Project Participants have invested in green renewable energy based power generation by establishing a wind farm of 3.00 MW installed capacity at village Brahmanvel, District Dhule in the state of Maharashtra. The project mainly aims at generating electricity from renewable source namely wind energy and consists of four wind mills of 0.75 MW capacity each. The electricity generated is fed to Western regional grid of India. The project activity will result in avoidance of greenhouse gas (GHG) emission generations, which would have otherwise occurred due to CO_2 emissions from electricity generation by fossil fuel, based power plants that is supplied to MSEDCL.

[1] Commissioning Reports from Superintending Engineer MSEDCL O&M Circle Dhule.
[2] Performa Innovices from VESTAS.
[3] Commissioning Reports from Superintending Engineer MSEDCL O&M Circle Dhule.

Purpose of the project activity:

Indian economy is highly dependent on "Coal" as fuel to generate energy and for production processes. Thermal power plants are the major consumers of coal in India yet the basis electricity needs of a larger section of population are not being met.

This results in excessive demands for electricity and places immense stress on the environment by producing abundant pollution. Changing coal consumption patterns will require a multi-branched strategy focusing on demand, reducing wastage of energy and the optimum use of Renewable Energy (RE) sources

The main purpose of the project activity is to generate electrical energy through sustainable means using wind power resources, and to utilize the generated output for selling it to the State Electricity Distribution Company for meeting the energy shortages in the state and to contribute to climate change mitigation efforts. This explains that the project activity reduces GHG emissions.

Apart from generation of renewable electricity, the project has also been conceived for the following:

- To enhance the propagation of wind turbines in the region
- To contribute to the sustainable development of the region, socially, environmentally and economically
- To reduce the prevalent regulatory risks for this wind park through revenues from the CDM

View of the project participants on the contribution of the project activity to sustainable development:

a. Social well being – The proposed project activity leads to alleviation of poverty by establishing direct and indirect employment benefits growing out of auxiliary units for manufacturing lattice towers for erecting the Wind Electric Generators (WEGs) and for maintenance during operation of the project activity. The infrastructure in and around the project area will also improve due to project activities. This includes development of road network and improvement of electricity quality, frequency and availability as the electricity is fed into a deficit grid.

b. Economic well-being – The CDM project activity should bring in additional investment consistent with the needs of the people. The project activity leads to an investment of about INR 15.55 Crore to a developing region which otherwise would not have happened in the absence of project activity. The generated electricity is fed into the Western regional 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 also leads to diversification of the national energy supply, which is dominated by conventional fuel based generating units.

c. 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 specific emissions (emissions of pollutant/unit of energy generated) including GHG emissions. As wind power projects produce no end products in the form of solid waste (ash etc.), they address the problem of solid waste disposal encountered by most other sources of power. 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.

d. Technological well being – The project activity leads to the promotion of four 0.75 MW Wind Electric Generators (WEGs) into the region, demonstrating the success 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. Hence this environmentally safe and sound project leads to technological well-being.

A.3. Project participants:

Name of Party involved (*) ((host) indicates a host party)	Private and/or public entity (ies) Project participants (*) (as applicable)	Kindly indicate if the party involved wishes to be considered as project participant (Yes/No)
India (Host Country)	Private Entity: Shree Jai Ambe Associates (Power Division), Gondia, Maharashtra.	No
(*) In accordance with the CDM modalities and procedure, at the time of making the CDM-PDD public at the stage of validation, a party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party (ies) involved is required.		

A.4. Technical description of the small-scale project activity:

A.4.1. Location of the small-scale project activity:

A.4.1.1. Host Party (ies):

Country: India

A.4.1.2. Region/State/Province etc.:

State: Maharashtra

A.4.1.3. City/Town/Community etc:

District: Dhule
Taluka: Sakri
Village: Brahmanvel

A.4.1.4.Details of physical location, including information allowing the unique identification of this small-scale project activity:

The project activity involves installation of windmills located at Village Brahmanvel, Dist.- Dhule in the state of Maharashtra. WEG wise location details are as follows:

Latitude: 21°8'60 N

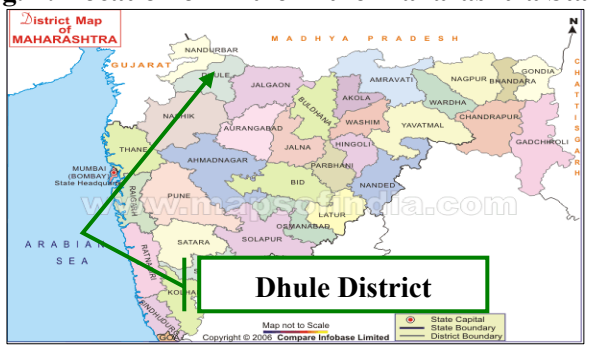
Longitude: 74°13'0 E

Mean annual wind speed[4]: 23.1 km / h at 30m height. Mean annual wind power density: 324 w/m^2 at 50m height and 278 w/m^2 at mast.

Sr. No.	Wind mill Location No.	Village	Taluka	District
1	D1	Brahmanvel	Sakri	Dhule
2	D2	Brahmanvel	Sakri	Dhule
3	D6	Brahmanvel	Sakri	Dhule
4	AA	Brahmanvel	Sakri	Dhule

Fig 1: Location of Maharashtra in India

Fig. 2: Location of Dhule in the Maharashtra State



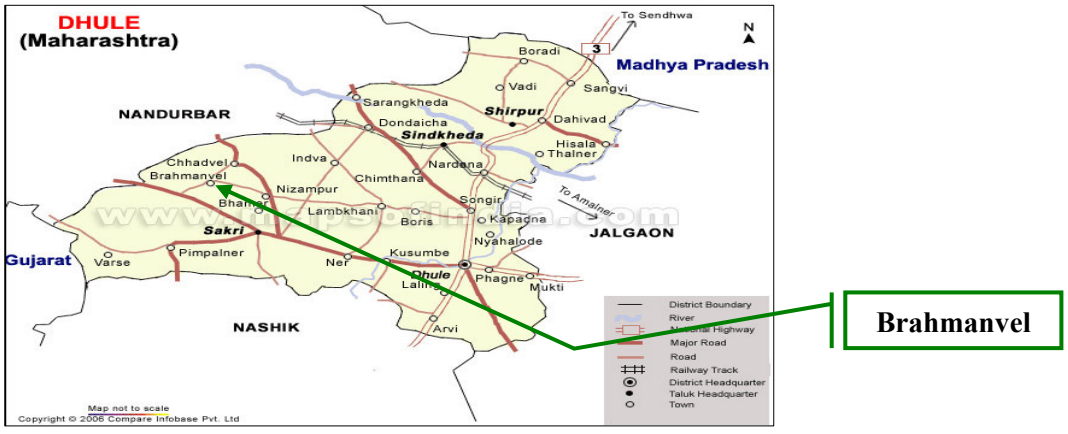


Fig. 3: Location of Brahmanvel in Dhule District

A.4.2. Type and category (ies) and technology/measure of the small-scale project activity:

[4] Values of Mean Annual Wind Speed and Mean Annual Wind Power Density are taken from Centre for Wind Energy Technology, which is ISO 9001-2000 certified.
http://www.cwet.tn.nic.in/Docu/WindMonitoringStations.pdf

Type and Category

Since, the capacity of the proposed project is only 3.00 MW, which is less than the maximum qualifying capacity of 15MW; the project activity has been considered as a small-scale project.

CDM project activity and UNFCCC indicative simplified modalities and procedures are applied. The project activity utilizes the wind potential for power generation and exports the generated electricity to the grid. According to small-scale CDM modalities the project activity falls under:

Sectoral Scope: 1 Energy industries (renewable / non renewable sources)
Type: I Renewable Energy Projects
Category: I-D Grid connected renewable electricity generation

Technology details of the Project activity:

In wind energy generation, kinetic energy of wind is converted into mechanical energy and subsequently into electrical energy.

Wind blowing at high speeds has a considerable amount of kinetic energy. When this kinetic energy 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 producing electricity. There are no GHG emissions associated with the electricity generation. Thus it is ensured that the technology is environmentally safe & sound. This CDM project activity involves the establishment of Wind Power project of 3.00 MW installed capacity by four 0.75 MW Windmills of Vestas (formally – NEG Micon) make by Shree Jai Ambe Associates (Power Division).

Technical concept & Technological details of VESTAS (formally – NEG Micon)

Sr.	Item	Details
1	Model no.	NM48
2	Rating in kW	750
3	Rotor Diameter (m)	48.2
4	No. of Blades	3
5	Rated Voltage (v)	690V
6.	Rated Wind speed (m/s)	16 m/s

***Salient features of 0.75 MW WEGs**:*

1. Higher Efficiency - Designed to achieve increased efficiency and co-efficient of power (Cp)
2. Minimum Stress and Load - Well-balanced weight distribution ensures lower static & dynamic loads
3. Shock Load-free Operation - Advanced hydrodynamic fluid coupling absorbs peak loads and vibrations
4. Intelligent Control - Next generation technologies applied by extensive operational experience maximizes yield
5. Maximum Power Factor - High-speed asynchronous generator with a multi-stage intelligent switching compensation system delivers power factor up to 0.99
6. Climatic Shield - Hermetically sheltered, advanced over-voltage and lightning protection system

7. Unique Micro-Pitching Control - Unmatched fine pitching with 0.1° resolution to extract every possible unit of power
8. Grid-friendly - Grid friendly design generates harmonics-free pure sinusoidal power
9. ISO-certified vendor confirm high quality components
10. ISO 9001:2001 for Design, Development, Manufacture and Supply of Wind Turbines
11. ISO 9001:2001 certification for Installation, Commissioning, Operation and Maintenance
12. Type certification by Det Norske Veritas, Denmark

Technology transfer:

No technology transfer from other countries is involved in this project activity.

A.4.3 Estimated amount of emission reductions over the chosen crediting period:

The expected emission reductions are calculated based on the electricity fed to the Western regional grid and combined margin emission factor of 0.8975 tCO_2/MWh[5] based on "Tool to calculate the emission factor for an electricity system (Version 01.1)" which is fixed over the crediting period. Central Electricity Authority (CEA) bases emission factor on compiled database for the fiscal year 2006-07. The estimated annual quantity of emission reductions due to the project activity is 5313 tCO_2e. A fixed crediting period of 10 (ten) years is selected for the small-scale project activity.
Year wise estimation of emission reductions during the crediting period is shown below.

Years	Estimation of annual emission Reductions tCO_2e
2009	5313
2010	5313
2011	5313
2012	5313
2013	5313
2014	5313
2015	5313
2016	5313
2017	5313
2018	5313
Total estimated reductions (tonnes of CO_2e)	**53130**
Total number of crediting years	**10**
Annual average over the crediting period of estimated reductions (tonnes of CO2 e)	**5313**

In the above table the year 2009 corresponds to the period starting from 01.08.2009 to 31.07.2010. Similar interpretation shall apply for subsequent years.

[5] Baseline CO_2 Emission Database for Indian Power Sector - Version 03, December 2007, Government of India, Ministry of Power, Central Electricity Authority (CEA).
http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm

A.4.4. Public funding of the small-scale project activity:

There is no public funding involved in the project activity. The project activity has been developed on the basis of in-house resources of the company & loan from the bank.

A.4.5. Confirmation that the small-scale project activity is not a debundled component of a large-scale project activity:

According to paragraph 2 of Appendix C to the Simplified Modalities and Procedures for Small-Scale CDM project activities (FCCC/CP/2002/7/Add.3), a small-scale project is considered a debundled component of a large project activity if there is a registered small-scale activity or an application to register another small-scale activity:

- With the same project participants
- In the same project category and technology
- Registered within the previous two years; and
- Whose project boundary is within 1km of the project boundary of the proposed small scale activity

The project promoters hereby confirm that there is no registered small scale project activity registered within the previous two years with them in the same project category and technology whose project boundary is within 1km of the project boundary of the proposed small scale activity. Thus the project is not a debundled component of any other large-scale project activity.

SECTION B. Application of a baseline and monitoring methodology

B.1. Title and reference of the approved baseline and monitoring methodology applied to the small-scale project activity:

The methodology followed will be "AMS I.D.Version 13 (Valid from 14 Dec 07 onward) Approved methodology for Small Scale Projects" under the sectoral scope "Grid connected renewable electricity generation" which is most appropriate for this Project and is listed as per the UNFCCC norms.

Project Type : I – Renewable energy projects
Project Category : D – Grid connected renewable electricity generation (AMS I.D.Version 13 (Valid from 14 Dec 07 onward))
Reference : Appendix B of simplified M&P for small scale project activities (UNFCCC, Recent norms)

B.2 Justification of the choice of the project category:

I D Grid connected renewable electricity generation

Sr.	Technology / measure	Justification
1	This category comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass, that supply electricity to and/or displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit.	The project activity is the installation of windmills, which utilize the renewable energy of wind to generate electricity connected to grid.
2	If the unit added has both renewable and non-renewable components (e.g.. a wind/diesel unit), the eligibility limit of 15MW for a small-scale CDM project activity applies only to the renewable component. If the unit added co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15MW.	The project activity involves the installation of four of 0.75 MW capacity, which contributes to total of 3.00 MW and is less than the limiting capacity of 15 MW.
3	Combined heat and power (co-generation) systems are not eligible under this category.	As it is already stated that the activity include only wind mills of 3.00 MW capacities and does not include any co-generation process. Thus, project falls in this category.
4	In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	There is all together new installation of 3.00 MW windmills and not any addition to existing units.
5	Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category. To qualify as a small-scale project, the total output of	There is all together new installation of 3.00 MW wind mills and not any addition or

	the modified or retrofitted unit shall not exceed the limit of 15 MW.	modification to the existing unit.

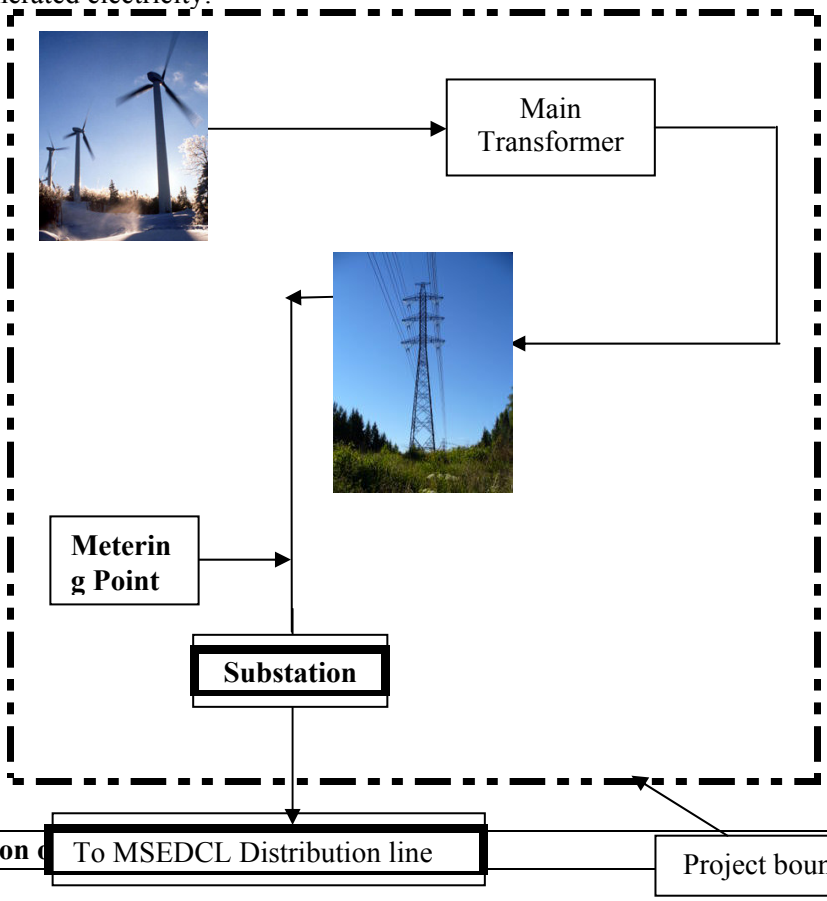
At this project site, four windmills are generating electricity, which is then supplied to Western regional grid of India.

In this project, total electricity generation capacity of all four windmills is 3.00 MW, which is less than the limit of 15 MW of maximum output capacity as specified in Annex-II "Simplified Modalities & Procedures for Small Scale CDM Project Activities" for Type (i) project activities: renewable energy project activities with a maximum output capacity equivalent to up to 15 megawatts (or an appropriate equivalent) (decision 17/CP.7, paragraph 6 (c) (i)). Thus, this project reduces anthropogenic emissions by sources and its maximum output capacity is less than 15 MW. Therefore it confirms to this category thereby qualifying as a small-scale project activity.

B.3. Description of the project boundary:

As per the Appendix B of simplified modalities & procedures for small-scale CDM-project activities, the project boundary is "The project boundary encompasses the physical, geographical site of the renewable generation source."

In this project activity, the project boundary is composed of the Wind Energy Generators and the metering equipment for each generator and substation, and the grid (Western regional grid) which is used to transmit the generated electricity.



B.4. Description

[6]Baseline as per Paragraph 9 of "Type AMS. I-D Grid connected renewable electricity generation (Version 13: Valid from 14 December 07 onwards)" of Appendix B of the simplified M&P for small-scale CDM project activities states that:

"For all other systems, the baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kg CO_2e/kWh) calculated in a transparent and conservative manner as:

(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 emissions (in kg CO_2e/kWh) of the current generation mix. The data of the year in which project generation occurs must be used.

Calculations must be based on data from an official source (where available) and made publicly available.

Baseline emission reductions have been estimated using combined margin (CM), which is calculated as ex-ante and fixed throughout the crediting period, consisting of the combination of operating margin (OM) and build margin (BM) as per option (a) stated above and according to the procedures prescribed in the *"Tool to calculate the emission factor for an electricity system"* (Version 01.1, EB 35) by using the following six steps:

STEP 1. Identify the relevant electric power system.

STEP 2. Select an operating margin (OM) method.

STEP 3. Calculate the operating margin emission factor according to the selected method.

STEP 4. Identify the cohort of power units to be included in the build margin (BM).

STEP 5. Calculate the build margin emission factor.

STEP 6. Calculate the combined margin (CM) emissions factor.

The calculation of Baseline Emission Reductions and Combined Margin Emission Factor are evaluated in section B.6 of this PDD.

6 http://cdm.unfccc.int/UserManagement/FileStorage/CDMWF_AM_PHPV5WESACMBTJ2YY54GAJYSIEI3HD

B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered small-scale CDM project activity:

Justification for additionality of the project
Attachment A to Appendix B

Project participants shall provide an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers:

(a) Investment barrier: a financially more viable alternative to the project activity would have led to higher emissions;
(b) Technological barrier: a less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and so would have led to higher emissions;
(c) Barrier due to prevailing practice: prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions;
(d) Other barriers: without the project activity, for another specific reason identified by the project participant, such as institutional barriers or limited information, managerial resources, organizational capacity, financial resources, or capacity to absorb new technologies, emissions would have been higher.

From the above barrier project activity gone through the following barrier:

Investment Barriers:

Return on Investment

Though it was envisaged that full support would be given to renewable power projects in the country by MNRE and state governments by providing some incentives, historically it is observed that even this support is not sufficient enough to make these projects economically viable without some external funding like CDM revenue (which can be proven by registration of several renewable projects in India with UNFCCC) and hence the developer realized CDM funds would be needed to make the project an attractive investment as outlined below:

An investment analysis of the project activity was conducted by all the project proponents with the **Project Internal Rate of Return** (Project IRR) as the financial indicator. 'Project Internal Rate of Return' is one of the known financial indicators used by banks, financial institutions and project developers for making investment decisions. The relevant Benchmark value has been determined according to Tool for the demonstration and assessment of additionality (Version 05.2)[7], Clause (a) of Sub-step 2b: Option III – Apply Benchmark Analysis, which states that - benchmarks shall be derived from Government bond rates, increased by a suitable risk premium to reflect private investment and/or the project type, as substantiated by an independent (financial) expert or documented by official publicly available financial data;

[7] Tool for the demonstration and assessment of additionality (Version 05.2), page 06
http://cdm.unfccc.int/Reference/tools/ls/meth_tool01.pdf

Following figures have been considered for arriving at the relevant benchmark
Government Bond Rate = Average of rate for previous three years 2005-06[8], 2004-05[9] and 2003-04[10] for 20 year maturity period

December **Reserve Bank of India Bulletin** **2006**

No. 27 C: MONTH-END YIELD TO MATURITY OF SGL TRANSACTION IN CENTRAL GOVERNMENT DATED SECURITIES FOR VARIOUS RESIDUAL MATURITIES

(Per cent)

Term to Maturity (In years)	2005		2006									
	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.
1	2	3	4	5	6	7	8	9	10	11	12	13
20	7.4440	7.4058	-	7.5694	7.7261	7.7902	8.0768	-	8.6829	8.2499	8.0578	7.9912

December **Reserve Bank of India Bulletin** **2005**

No. 27 C: MONTH-END YIELD TO MATURITY OF SGL TRANSACTION IN CENTRAL GOVERNMENT DATED SECURITIES FOR VARIOUS RESIDUAL MATURITIES

(Per cent)

Term to Maturity (In years)	2004			2005								
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.
1	2	3	4	5	6	7	8	9	10	11	12	13
20	-	7.6159	6.9602	6.9679	7.0577	7.1404	7.6059	7.4963	7.3517	7.4378	7.4994	7.4381

December **Reserve Bank of India Bulletin** **2004**

No. 27 C: MONTH-END YIELD TO MATURITY OF SGL TRANSACTION IN CENTRAL GOVERNMENT DATED SECURITIES FOR VARIOUS RESIDUAL MATURITIES

(Per cent)

Term to Maturity (In years)	2003		2004									
	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.
1	2	3	4	5	6	7	8	9	10	11	12	13
20	5.9268	5.9432	6.0602	6.0189	5.8909	5.7694	5.9456	6.5005	-	6.8951	-	-

= 7.2%

Market Risk Premium[11]

= 8.75%

Benchmark = 7.2% + 8.75% = 15.95%

[8] http://rbidocs.rbi.org.in/rdocs/Bulletin/PDFs/74675.pdf
[9] http://rbidocs.rbi.org.in/rdocs/Bulletin/PDFs/67219.pdf
[10] http://rbidocs.rbi.org.in/rdocs/Bulletin/PDFs/59442.pdf
[11] http://www.iimahd.ernet.in/~jrvarma/papers/WP2006-06-04.pdf. (page 09, first para, first line, risk premium on geometric basis)

Investment Analysis				
Project Details:	**Shree Jai Ambe Associates**	**Automotive Valves Pvt. Ltd.**	**M.G. Patel & Brothers**	**Gayson & Company Pvt. Ltd.**
Size of the Project(MW)	**0.75**	**0.75**	**0.75**	**0.75**
Location of the Project	**Dhule, Maharashtra**	**Dhule, Maharashtra**	**Dhule, Maharashtra**	**Dhule, Maharashtra**
No of WEGs	**1**	**1**	**1**	**1**
Project Cost:				
Cost of WEGs	**352.78**	**352.78**	**352.78**	**360.78**
Erection & Installation	**11.22**	**11.22**	**11.22**	**11.22**
MEDA Charges	**3.77**	**3.77**	**3.77**	**3.77**
Interest Capitalized	**5.51**	**3.67**	**5.51**	**4.26**
Land Cost	**16.00**	**16.00**	**16.00**	**16.00**
Loan Processing Charge	**3.22**	**2.41**	**3.22**	**0.70**
Total Cost(Rs. in Lakhs[12])	**392.50**	**389.85**	**392.50**	**396.73**
Recuring Cost:				
O&M Cost (Rs. Lakhs)	**5.40**	**5.40**	**5.40**	**5.40**
O&M Escalation (%)	**7.50%**	**7.50%**	**7.50%**	**7.50%**
Insurance (Rs. Lakhs)	**2.17**	**2.17**	**2.17**	**2.17**
Annual Depreciation as per companies act	**5.28%**	**5.28%**	**5.28%**	**5.28%**
Pre/Post September Installation(1/2)	**2**	**2**	**2**	**2**
Project Financials:				
Equity (Rs. Lakhs)	**122.50**	**189.85**	**122.50**	**116.73**
Debt (Rs.Lakhs)	**270.00**	**200.00**	**270.00**	**280.00**
Loan Repayment Years	**10**	**5**	**10**	**5**
Moratorium in months	**12**	**6**	**12**	**6**
Interest (%)	**12.25%**	**11.00%**	**12.25%**	**9.12%**
Tariff Details:				
Tariff (Rs./KWh)	**3.50**	**3.50**	**3.50**	**3.50**
Escalation (Rs./KWh)	**0.15**	**0.15**	**0.15**	**0.15**

[12] Conversion: 10 Lakhs = 1 Million

Investment Analysis				
Project Details:	**Shree Jai Ambe Associates**	**Automotive Valves Pvt. Ltd.**	**M.G. Patel & Brothers**	**Gayson & Company Pvt. Ltd.**
Tax Components:				
MAT (%)	**8.415%**	**8.415%**	**8.415%**	**8.415%**
Corporate Tax (%)	**33.66%**	**33.66%**	**33.66%**	**33.66%**
CDM Components:				
CER Price (in Euros)	**10.00**	**10.00**	**10.00**	**10.00**
Emission Factor(tCO_2/MWh)	**0.8975**	**0.8975**	**0.8975**	**0.8975**
Euro - Rupee Conversion Factor	**60.00**	**60.00**	**60.00**	**60.00**
Deration after 10th year	**5.00%**	**5.00%**	**5.00%**	**5.00%**
Generation Details:				
Project Size (MW)	**0.75**	**0.75**	**0.75**	**0.75**
CUF (%)	**22.83%**	**22.83%**	**22.83%**	**21.61%**
Working Days	**365**	**365**	**365**	**365**
Working Hours	**24**	**24**	**24**	**24**
Generation(Million KWh/annum)	**1.50**	**1.50**	**1.50**	**1.42**

The Project IRR for the project activity has been calculated by considering all above techno economical parameters & has been compared with the calculated benchmark by referring to Government Bond Rate and Market Risk Premium for all the project proponents.

Name of Project Proponent	Project IRR Without CDM Benefits	Project IRR With CDM Benefits	Minimum expected rate of return
Shree Jai Ambe Associates	13.72%	14.95%	15.95%
Automotive Valves	13.23%	14.31%	
M.G. Patel & Brothers	13.72%	14.95%	
Gayson & Company	12.18%	13.25%	

It shows that Investment option (Project Activity) for the project proponents is not at all financially attractive option for them as IRR is less than minimum expected rate of returns. CDM revenue for the project activity improves the IRR of project activity by 1% to 2% (Depending on Volatile Prices of CERs) which compensate the returns but with huge risk associate to the project activity. The huge risk associated with the project activity is the generation risk as availability of wind is season dependent.

In such conditions CDM revenue for the project activity is very much essential to compensate the huge loss in the investment option that project proponents have done & to promote renewable energy technologies (Particularly Wind) in such a region (India) where most of the people is still facing problem of electricity availability (In India Power Deficiency in the range 8 % to 12 %).

Sensitivity Analysis:

It can be perceived that financial return of the project activity is highly sensitive to generation, tariff rate, O&M Cost and Project Cost. The sensitivity analysis was carried out considering a 10% variation in the generation, in the tariff rates (after termination of 13 year contract with MSEDCL), in O&M cost (after the termination of 5 year contract) and project cost and the results are tabulated below.

		Decrease in Generation				Increase in Generation			
Generation in %		-10	-7.5	-5	-2.5	+2.5	+5	+7.5	+10
Project IRR Without CDM Benefits in %	Shree Jai Ambe Associates	11.88	12.35	12.82	13.27	14.16	14.59	15.02	15.44
	Automotive Valves	11.50	11.94	12.38	12.81	13.65	14.06	14.46	14.86
	M.G. Patel & Brother	11.88	12.35	12.82	13.27	14.16	14.59	15.02	15.44
	Gayson & Company	10.49	10.93	11.35	11.77	12.59	12.98	13.38	13.76
Benchmark		15.95%							

It can be observed that even with 10% increase in generation, IRR without CDM revenue is still not crossing benchmark.

		Decrease in Tariff Rate				Increase in Tariff Rate			
Tariff Rate in %		-10	-7.5	-5	-2.5	+2.5	+5	+7.5	+10
Constant Rates 14th Year Onwards in Rs.		3.15	3.24	3.33	3.41	3.59	3.68	3.76	3.85
Project IRR Without CDM Benefits in %	Shree Jai Ambe Associates	13.59	13.62	13.66	13.68	13.75	13.78	13.81	13.84
	Automotive Valves	13.10	13.13	13.17	13.20	13.27	13.30	13.33	13.36
	M.G. Patel & Brother	13.59	13.62	13.66	13.68	13.75	13.78	13.81	13.84
	Gayson & Company	12.04	12.08	12.11	12.15	12.22	12.25	12.28	12.32
Benchmark		15.95%							

It can be observed that even with 10% increase in tariff rate; IRR without CDM revenue is in range of 13.45% for all project proponents, which is far less than the decided benchmark.

The tariff rate after 13th year is considered constant as 3.50 Rs./kWh till the completion of WEGs lifetime (20 years). This value is considered by the PPs at the time of investment decision as after investigating

they found such reference at MERC Order[13] dated 24th November 2003. In this order MERC has given tariff proposal for Group III (New Projects commissioned after 01.04.2003) and made it available for public comments. The starting tariff rate of Group II WEGs (Projects commissioned before 01.04.2003) was very low. Hence, MERC had proposed the tariff which says – "Tariff for Sale to MSEB, other utilities and Licensees: Rs.3.50/unit for the first year with escalation @30 paise per unit every year for the first 10 years from the date of commissioning of the project and rate to be reduced and frozen at Rs. 3.25 per unit from 11th year onwards". This raised high rates are to overcome the burden of initial investment cost, long term loan repayment period, to encourage the investor for new installation and others (factors which had contributed to MERC decision, from page 96 to page 110) by the investors; but after the end of contract period the tariff will be low and constant for rest of the lifetime of WEGs. From this tariff proposal it was made clear by MERC that the tariff rates after completion of contracting period is low and constant for rest of the WEGs lifetime.

Apart from this order, PPs have considered the constant tariff rate as 3.50 Rs./KWh with reference to the proposal from Vestas (Annexure of Projected Cash Flows) available with them at the time of conceptualization.

		Decrease in O&M Cost				Increase in O&M Cost			
O&M Cost in %		-10	-7.5	-5	-2.5	+2.5	+5	+7.5	+10
O&M Cost for 6th Year with 7.5% Escalation in Lacs Rs.		6.48	6.66	6.84	7.02	7.38	7.57	7.75	7.93
Project IRR Without CDM Benefits in %	Shree Jai Ambe Associates	13.85	13.82	13.79	13.75	13.68	13.65	13.61	13.58
	Automotive Valves	13.37	13.33	13.30	13.27	13.20	13.16	13.13	13.10
	M.G. Patel & Brother	13.85	13.82	13.79	13.75	13.68	13.65	13.61	13.58
	Gayson & Company	12.33	12.29	12.25	12.22	12.15	12.11	12.07	12.03
Benchmark		15.95%							

It can be observed that even with 10% increase in O&M cost, IRR without CDM revenue is still not crossing benchmark.

		Decrease in Project Cost				Increase in Project Cost			
Project Cost in %		-10	-7.5	-5	-2.5	+2.5	+5	+7.5	+10
Project IRR Without CDM Benefits in %	Shree Jai Ambe Associates	15.34	14.91	14.50	14.1	13.35	12.99	12.65	12.32
	Automotive Valves	14.78	14.37	13.98	13.6	12.88	12.54	12.21	11.90
	~~M.G. Patel~~	~~15.34~~	~~14.91~~	~~14.50~~	~~14.1~~	~~13.35~~	~~12.99~~	~~12.65~~	~~12.32~~

[13] MERC Order dated 24th November 2003 for Case No. 17(3), 3, 4 &5 of 2002
www.mercindia.org.in/pdf/Detail_Wind_Energy_Order.pdf

	& Brother								
	Gayson & Company	13.69	13.29	12.90	12.54	11.84	11.51	11.19	10.89
Benchmark		15.95%							

Sensitivity analysis on Project Cost again show that even with the decrease of 10% in project cost the IRR without CDM revenue is not crossing the benchmark.

Therefore it can be seen that the implemented project activity is not feasible without CDM revenue. The project proponents have analysis all these risks and implemented the project after considering the CDM benefits.

Early Consideration of CDM

The project proponent was aware of the various barriers associated with project implementation. However it was felt that the additional revenue against the sale consideration of carbon credits generated due to the project activity would help in augmenting these barriers to certain extent.

Shree Jai Ambe Associates (Power Division) has seriously considered the CDM revenues for the project activity before starting the construction activity of the project itself. Proof of consideration of CDM is Resolution passed by the Director of Firm of Shree Jai Ambe Associates (Power Division). The seriousness of CDM consideration can also be seen from 'Chronology of Events' for Project Participants mentioned in tabular format in Annex 5 of this PDD.

In view of the above analysis, the proposed project activity is additional and not the same as the baseline scenario.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

The project activity involves generation of electricity by the renewable energy, which is wind energy in this project. In the absence of the project activity equivalent amount of electricity would have been taken from the grid, which is predominately connected by the thermal power stations. Therefore current grid is taken as baseline scenario.

Baseline Emissions:

Baseline emission reductions have been estimated using combined margin (CM), which is calculated as ex-ante and fixed throughout the crediting period, 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"* (Version 01.1, EB 35) by using the following six steps:

Step 1: Identification of the relevant electric power system

Central Electricity Authority of India, Ministry of Power, Government of India (Host Country) has given the delineations of the project electricity system and the connected electricity system in India. As per CEA latest guideline, the Indian power system is divided into five independent regional grids, namely Northern, Eastern, Western, Southern, and North-Eastern. Each grid covers several States. Power generation and supply within the regional grid is managed by Regional Load Dispatch Centre (RLDC). The Regional Power Committees (RPCs) provide a common platform for discussion and solution to the problems relating to the regional grid. Each State in a regional grid meets its demand with its own generation facilities and with allocation of power plants owned by the central agencies such as NTPC and NHPC etc. Depending on the demand and generation, there are electricity imports and exports between the States of a regional grid. There are also electricity transfers between regional grids.

Geographical scope of the two electricity grids:

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	Dadra & Nagar Haveli	Meghalaya	Tamil Nadu
Jammu &Kashmir	Sikkim	Madhya Pradesh	Mizoram	Pondicherry
Punjab	Andaman-Nicobar	**Maharashtra**	Nagaland	Lakshadweep
Rajasthan		Goa	Tripura	
Uttar Pradesh				
Uttarakhand				

For the purpose of calculating the emission reductions achieved by any CDM project, the *"Tool to calculate the emission factor for an electricity system"* (Version 01.1, EB 35) requires that the "project electricity system is defined by the spatial extent of the power plants that can be dispatched without significant transmission constraints". This implies that the grid emission factors could be most appropriately calculated at the level of the five electricity grids. As per the delineation given by CEA, Maharashtra State falls into the Western regional grid.

Step 2: Selection of an Operating Margin (OM) method

For calculation of operating margin four options are available:

(a) Simple operating margin;
(b) Simple adjusted operating margin;
(c) Dispatch data analysis operating margin;
(d) Average operating margin

CO_2 Baseline Database Version 03, Date – December 2007, published by Central Electricity Authority (hereafter CEA Database) has been referred for the values of OM. As per the *"Tool to calculate the emission factor for an electricity system"*, any of the four methods can be used, however, the simple OM method can be used only if the low-cost/must run resources constitute less than 50% of the total grid generation in: 1) average of the five most recent years, or 2) based on long term averages for hydroelectricity production.

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

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

	2002-03	2003-04	2004-05	2005-06	2006-07
North	26.1%	28.1%	26.8%	28.1%	27.1%
East	7.5%	10.3%	10.5%	7.2%	9.0%
South	18.3%	16.2%	21.6%	27.0%	28.3%
West	8.2%	9.1%	8.8%	12.0%	13.9%
North-East	45.8%	41.9%	55.5%	52.7%	44.1%
India	**16.3%**	**17.1%**	**18.0%**	**20.1%**	**20.9%**
Average of five years for Western region grid					**10.40%**

Table reference - CEA Baseline Database, Version 03

In Western region, the low-cost/must run resources constitute only 10.40% (as demonstrated above) of the total grid generation in average of the five most recent years, hence simple OM has been opted for.

Step 3: Ex-ante Calculation of operating margin emission factor ($EF_{OM,y}$) for the region based on simple OM

OM (Simple OM) values have been taken from CEA Database as discussed above. The *"Tool to calculate the emission factor for an electricity system"* has been used in the CEA Baseline Database for the calculation of operating margin.

As per the *"Tool to calculate the emission factor for an electricity system"* (Version 01.1, EB 35), the calculation of OM has been done *ex-ante* based on the full generation average for most recent 3 years for which data is available at the time of submission of monitoring report.

Average Simple Operating Margin (tCO_2/MWh):

Years	2004-05	2005-06	2006-07
Simple Operating Margin	1.01	1.00	0.99
Average of three years for Western Grid			**1.00**

Table reference – CEA Baseline Database, Version 03

Step 4: Identification of the cohort of power units to be included in Build Margin (BM)

BM calculation is based on 20% most recent capacity additions in the grid based on net generation. 20% of the most recent capacity additions have been shown in following table. Power plant registered as CDM project activities have been excluded from the sample group *m*. Capacity additions from retrofits of power plants have not been included in the calculation of the build margin emission factor.

20% of Net Generation (GWh):

	2003-04	2004-05	2005-06	2006-07
North		31,458	33,641	35,845
East		15,594	17,203	18,764
South		26,935	27,666	30,441
West		34,145	35,201	37,099
North-East		1,552	1,531	1,366
India		109,685	115,241	123,513

Table reference – CEA Baseline Database, Version 03

Net Generation in Built Margin (GWh):

	2003-04	2004-05	2005-06	2006-07
North		32,064	34,340	36,511
East		15,818	17,567	18,907
South		28,513	28,228	30,442
West		35,257	35,425	38,242
North-East		2,055	1,793	1,437
India		113,707	117,353	125,538

Table reference – CEA Baseline Database, Version 03

Vintage of data is based on Option 1 of step 4. (Refer *"Tool to calculate the emission factor for an electricity system"* – Version 01.1, EB 35). BM calculation has been done *ex-ante* and hence BM value will remain fixed and need not be monitored during the crediting period.

Step 5: Calculation of build margin ($EF_{BM,y}$) emission factor for the region (ex-ante)

BM values have been taken from CO_2 Baseline Database for the Indian Power Sector, Version 03, December 2007. CO_2 Baseline Database for the Indian Power Sector is published by Central Electricity Authority, Ministry of Power, Govt. of India.

Build Margin (tCO_2/MWh):

	2003-04	2004-05	2005-06	2006-07
North		0.53	0.60	0.63
East		0.90	0.97	0.93
South		0.70	0.71	0.71
West		0.77	0.63	0.59
North-East		0.15	0.15	0.23
India		0.69	0.68	0.68

Table reference – CEA Baseline Database, Version 03

Step 6: Calculation of combined margin (CM) emissions factor – Emission factor for the grid electricity ($EF_{CM,y}$)

The emission factor for grid electricity or grid emission factor (also referred as CO_2 Emission factor) is calculated as the weighted average of the operating margin emission factor ($EF_{OM,y}$) and the build margin emission factor ($EF_{BM,y}$), where the weights w_{OM} and w_{BM} for wind projects, by default, are 0.75 and 0.25 respectively. CM calculation has been done *ex-ante* and hence CM value will remain fixed and need not be monitored during the crediting period.

$EF_{CM,y}$ = Combined margin emission factor for Western regional grid (tCO_2/MWh)

$$\mathbf{EF_{CM,y} = [(EF_{BM,y} \times w_{BM}) + (EF_{OM,y} \times w_{OM})]}$$

Where:
EF_{Bmy} = Build Margin Emission Factor for year y (tCO_2/MWh) = 0.59
$EF_{OM,y}$ = Operating Margin Emission Factor for year y (tCO_2/MWh) = 1.00
w_{BM} = Weighting of Build margin emission factor (%) = 0.25
w_{OM} = Weighting of operating margin emission factor (%) = 0.75

$EF_{CM,y}$ = [(0.59 x 0.25) + (1.00 x 0.75)]
= 0.8975 tCO_2/MWh
= 0.0008975 tCO_2/KWh

Emission Reductions (ER_y):

The emission reductions from the project activity are equal to the baseline emissions (BE_y) minus sum of project emissions (PE_y) and leakage (L_y). Since the project activity generates electricity from wind, which is a zero emission source, there are no associated project emissions. As per AMS I.D, leakage need not be considered since there is no transfer of energy generating equipment from another activity or transfer of existing equipment to another activity. Therefore, project emissions and leakage from the project activity are zero and thus emission reductions from the project activity are directly equal to the baseline emissions.

$$\mathbf{ER_y = BE_y - (PE_y + L_y)}$$

where
BE_y = Baseline Emissions in year y.
PE_y = Project Emissions in year y (nil in this case)
L_y = Leakage in y (nil in this case)

B.6.2. Data and parameters that are available at validation:

Central Electricity Authority (CEA) have worked out baseline emission factor for various grids in India and made them publicly available i.e **"Baseline CO_2 Emission Database for Indian Power Sector"**, Version 03, December 2007, Government of India, Ministry of Power, Central Electricity Authority (CEA).
http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm

All the data for operating margin and built margin have been taken from "**CO_2 Baseline Database".** The CEA calculations are based on power generation, fuel consumption and fuel quality data obtained from the power stations.

(a) EF_y

Data / Parameter:	$EF_{CM, y}$
Data unit:	tCO_2/MWh
Description:	Combined Margin Grid Emission factor
Source of data used:	Calculated as per "Tool to calculate the emission factor for an electricity system (Version 01.1)"
Value applied:	0.8975
Justification of the choice of data or description of measurement methods and procedures actually applied:	The value applied is taken from the plant from CEA reviews. The weights used for calculating combined margin emission factor are 0.75 and 0.25 for operating margin and built margin respectively.
Any comment:	Data will be kept for crediting period + 2 years.

(b) $EF_{OM, y}$

Data / Parameter:	$EF_{OM, y}$
Data unit:	tCO_2/MWh
Description:	CO_2 Operating margin emission factor of the grid
Source of data used:	Calculated as per "Tool to calculate the emission factor for an electricity system (Version 01.1)" by taking previous three year average of OM (ex-ante).
Value applied:	1.00
Justification of the choice of data or description of measurement methods and procedures actually applied:	The value applied is taken from the plant from CEA reviews.
Any comment:	Data will be kept for crediting period + 2 years.

(c) $EF_{BM, y}$

Data / Parameter:	$EF_{BM, y}$
Data unit:	tCO_2/MWh
Description:	[14] CO_2 Build margin emission factor of the grid
Source of data used:	CEA website: Baseline Carbon Dioxide Emission Database Version 03

[14] http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm

	(Valid from December 2007)
Value applied:	0.59
Justification of the choice of data or description of measurement methods and procedures actually applied :	The value applied is taken from the plant from CEA reviews.
Any comment:	Data will be kept for crediting period + 2 years.

B.6.3 Ex-ante calculation of emission reductions:

The baseline methodology has followed the type one specified under project category I D. in Appendix B of simplified modalities & procedure for small-scale project activity. The project activity involves generation of electricity by the renewable energy, which is wind energy in this project. In the absence of the project activity equivalent amount of electricity would have been taken from the grid, which is predominately connected by the thermal power stations. Therefore current grid that is Western regional grid is taken as baseline scenario.

Baseline Emission: BE_y
The net baseline emission factor as per combined margin

$$EF_y = EF_{CM,\,y} = 0.8975\ tCO_2/MWh \quad \text{(As per section B.6.1 step 6)}$$

Baseline Emissions are the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kg CO_2e/kWh) calculated

The baseline emission is calculated as: $\mathbf{BE_y = EG_y \times EF_{CM,\,y}}$

= Net kWh produced by the windmills feed to grid x Baseline emission factor EF_y
= 4 x 1,500,000[15] x 0.8975 x 0.001
= 5313 tCO_2/ year

Where

0.001 = Conversion factor for tCO_2/MWh to tCO_2/KWh

Emission Reductions (ER_y):

$ER_y = BE_y – (PE_y + L_y)$
$ER_y = 5313 – (0 + 0)$
ER_y = 5313 tCO_2/ year

Where

BE_y=Baseline Emissions in year y
PE_y = Project Emissions in year y (nil in this case)
L_y = Leakage in y (nil in this case)

[15] Estimated Annual Average Generation for each windmill as described in 'Supply Agreement'.

B.6.4 Summary of the ex-ante estimation of emission reductions:

Summary of the ex-ante estimation of emission reductions are furnished below.

Year	Estimation of project activity emissions (tonnes of CO2e))	Estimation of Baseline activity emission (tonnes of CO2e)	Estimation of Leakage (tonnes of CO2e)	Estimation of emission reductions (tonnes of CO2e)
2009	0	5313	0	5313
2010	0	5313	0	5313
2011	0	5313	0	5313
2012	0	5313	0	5313
2013	0	5313	0	5313
2014	0	5313	0	5313
2015	0	5313	0	5313
2016	0	5313	0	5313
2017	0	5313	0	5313
2018	0	5313	0	5313
Total (tonnes of CO2e)	**0**	**53130**	**0**	**53130**

In the above table the year 2009 corresponds to the period starting from 01.08.2009 to 31.07.2010. Similar interpretation shall apply for remaining years.

B.7 Application of a monitoring methodology and description of the monitoring plan:

B.7.1 Data and parameters monitored:

The proposed bundled projects are of Type I Renewable Energy Project – I. D Renewable Electricity Generation for a grid. As per clause 13 of AMS I.D.Version 13 (Valid from 14 Dec 07 onward) Appendix B of simplified modalities and Procedures for small-scale CDM project activities, monitoring methodology involves metering the electricity generated by renewable technology.

Data / Parameter:	**EG_y**
Data unit:	MWh
Description:	Net electricity (Export – Import) supplied to the grid by the project activity.
Source of data to be used:	Calculated as per apportion method describe in section B.7.2.
Value of data	5920.00 MWh (as per Proposals from Vestas - WEGs supplier)
Description of measurement methods and procedures to be applied:	Net Electricity supply to grid by project activity, will be calculated by subtraction of total export ($EG_{PP, export, app}$) and total import ($EG_{PP, import, app}$), which is used in calculation of emission reductions. - The total electricity exported by the WEGs are measured by electronic meter at the common metering point at Sakri substation (owned by MSEDCL) and recorded monthly, which can be cross verifier from the check meter at Sakri substation and Local Control System (LCS) reading installed at each WEG. - The total electricity imported by the WEGs are measured at the common metering point at Sakri substation (owned by MSEDCL) and recorded monthly, which can be cross verifier from the check meter at Sakri substation.
QA/QC procedures to be applied:	Refer section B.7.2 or Annex 4
Any comment:	Electricity is supplied by the project activity to the Western regional grid via Sakri substation. Data archived: Data will be archived for two years after the end of crediting period or of the last issuance of CERs for this project activity, whichever occurs later.

Data / Parameter:	**$EG_{PP, export}$**
Data unit:	MWh
Description:	Electricity generated and supplied to the common feeder of Sakri substation by the Project Proponent (PP) windmills.
Source of data to be used:	From Vestas Wind Technology India Pvt. Ltd.
Value of data	This value will not be directly used for estimation of emission reduction.
Description of measurement methods and procedures to be applied:	The electricity exported by the project proponent WEGs is measured at their individual WEGs' LCS. This parameter is used for apportioning of net electricity supplied to the grid.
QA/QC procedures to be	Refer section B.7.2 or Annex 4

applied:	
Any comment:	Electricity is supplied by the project activity WEGs to the Western regional grid via Sakri substation. Data will be archived for crediting period + 2 years.

Data / Parameter:	**$EG_{windfarm, export}$**
Data unit:	MWh
Description:	Electricity generated and supplied to the same feeder meter by all other windmills in the same windmill farm. (Excluding PPs WEGs)
Source of data to be used:	From Vestas Wind Technology India Pvt. Ltd.
Value of data:	This value will not be directly used for estimation of emission reduction.
Description of measurement methods and procedures to be applied:	The electricity exported by the WEGs of the farm other than PPs windmills is measured at their individual LCS. This parameter is used for apportioning of net electricity supplied to the grid.
QA/QC procedures to be applied:	Refer section B.7.2 or Annex 4
Any comment:	Electricity is supplied by the windmills of the farm to the Western regional grid via Sakri substation.

Data / Parameter:	**$EG_{feeder, export}$**
Data unit:	MWh
Description:	Total Electricity generated and supplied to the common feeder meter by all windmills of the farm. (Including PPs WEGs)
Source of data to be used:	Joint Meter Reading (JMR) from MSEDCL
Value of data:	This value will not be directly used for estimation of emission reduction.
Description of measurement methods and procedures to be applied:	The electricity exported by all the WEGs of the farm (Including PPs WEGs) is measured by electronic meter at common feeder of Sakri substation. This parameter is used for apportioning of net electricity supplied to the grid.
QA/QC procedures to be applied:	Refer section B.7.2 or Annex 4
Any comment:	Electricity is supplied by the windmills of the farm to the Western regional grid via Sakri substation.

Data / Parameter:	**$EG_{PP, export, app}$**
Data unit:	MWh
Description:	Electricity generated and supplied to the common feeder of Sakri substation by the project proponent windmills after apportion.
Source of data to be used:	Calculated based on the apportion method described in section B.7.2
Value of data	This value will not be directly used for estimation of emission reduction.
Description of measurement methods and procedures to be applied:	Calculated
QA/QC procedures to be applied:	Refer section B.7.2 or Annex 4
Any comment:	Electricity is supplied by the project activity WEGs to the Western

	regional grid via Sakri substation. Data will be archived for crediting period + 2 years.

Data / Parameter:	**$EG_{feeder, import}$**
Data unit:	MWh
Description:	Electricity imported from the grid by all windmills of the farm. (Including PPs WEGs)
Source of data to be used:	JMR from MSEDCL
Value of data:	This value will not be directly used for estimation of emission reduction.
Description of measurement methods and procedures to be applied:	The electricity imported by all the WEGs of the farm (Including PPs WEGs) is measured by electronic meter at common feeder at Sakri substation.
QA/QC procedures to be applied:	Refer section B.7.2 or Annex 4
Any comment:	Electricity is imported by all the WEGs of the farm by the Western regional grid via Sakri substation.

Data / Parameter:	**$EG_{PP, import, app}$**
Data unit:	MWh
Description:	Electricity demanded and imported from the grid by the project proponent windmills after apportion.
Source of data to be used:	Calculated based the apportion method described in section B.7.2
Value of data	This value will not be directly used for estimation of emission reduction.
Description of measurement methods and procedures to be applied:	Calculated
QA/QC procedures to be applied:	Refer section B.7.2 or Annex 4
Any comment:	Electricity is imported by the project activity WEGs by the Western regional grid via Sakri substation. Data will be archived for crediting period + 2 years.

B.7.2 Description of the monitoring plan:

This monitoring plan is developed in accordance with the modalities and procedures for small-scale CDM project activities and is proposed for grid-connected small-scale wind power project being implemented in Maharashtra state in India.

The project proponents have undertaken an operation and maintenance agreement with the supplier of the wind turbines i.e. Vestas (formally – NEG Micon) for a period of 5 years. The performance of the mills, safety in operation and scheduled /breakdown maintenances are organized and monitored by the contractor. So the authority and responsibility of project management lies with the contractor.

The monitoring personnel receive intensive training at the Vestas Manufacturing facility in Pondicherry before being appointed at the site to look after the operations.

As the operation of WEGs is emission free and no emissions are produced during the lifetime of the WEGs, no specific procedures have been laid down for emergency preparedness for cases where emergencies can cause unintended emissions.

Various activities carried out by the Operations and Maintenance team is as follows:

1 Routine Maintenance Services

Routine Maintenance Labour Work involves making available suitable manpower for operation and maintenance of the Equipment and covers periodic preventive maintenance, cleaning and upkeep of the Equipment including -

a) Tower Torquing
b) Blade Cleaning
c) Nacelle Torquing and Cleaning
d) Transformer Oil Filtration
e) Control Panel & LT Panel Maintenance
f) Site and Transformer Yard Maintenance

2 Security Services

This service includes watch and ward and Security of the Wind Farm and the Equipment.

3 Management Services

a) Data logging in for power generation, grid availability, machine availability.
b) Preparation and submission of monthly performance report in agreed format.
c) Taking monthly meter reading jointly with MSEDCL, of power generated at the Wind Farm and supplied to MSEDCL to the meter/s maintained by MSEDCL for the purpose and co-ordinate to obtain necessary power credit report / certificate.

4 Technical Services

a) Visual inspection of the WEGs and all parts thereof.
b) Technical Assistance including checking of various technical, safety and operational parameters of the Equipment, trouble shooting and relevant technical services.

The bundled project activity essentially involves generation of electricity from wind, the employed WEGs can only convert wind energy into electrical energy and cannot use any other input fuel for electricity generation. Thus no special ways and means are required to monitor leakage from the project activity. So monitoring only involves **metering the electricity generated by renewable technology**.

1. The Wind Energy generated from the WEGs has been evacuated to the Maharashtra State Grid System through the Maharashtra State Grid's sub-station (Sakri substation) and the evacuation facility is maintained by the Maharashtra State Electricity Board (MSEB).
2. The electricity generation measurements are required by the Maharashtra State Electricity Distribution Company Limited (MSEDCL) and the Project Participants (PPs) to assess electricity sales revenue and / or wheeling charges.
3. The bundled project activity therefore involves independent measurements of generated electricity for each of the four project proponents wind turbines.
4. The primary recording of the electricity fed to the MSEDCL will be carried out jointly at the incoming feeder main meter of the State Grid sub-station.

5. The joint measurement will be carried out on first working day of the month in presence of both parties (the developer's representative and officials of MSEDCL). Both parties will sign the recorded reading.
6. **Metering equipment:** Metering is carried out through electronic LCS (Local Control System) at each WEG and electronic meters at Sakri Substation. The LCS at WEG are installed and owned by project proponents. Power output is measured continuously for all three phases by LCS. The values calculated are stored and averaged using different averaging times. Based on the active power outputs measured in all three phases, a total three-phase power output is displayed in the meter. The power output displayed is summed up to give a total turbine power production. The main meter at Sakri substation has been installed and owned by MSEDCL along with check meter. The metering equipments are maintained in accordance with electricity standards. The readings shown by main meter alone will hold well for the purpose of billing.
7. **Meter Readings:** The monthly meter readings at the project site and the receiving station are taken simultaneously and jointly by the parties on the first working day of the following month. At the conclusion of each meter reading an appointed representative of the MSEDCL and the company signs a document indicating the number of KWh exported to the grid, which is obtained by subtraction of total electricity generated by WEGs and number of KWh imported from the grid.
8. The secondary recording, which will provide a backup in case of primary recording face some malfunctioning, would be done at the incoming feeder check meter. The main meter and check meter at the incoming feeder are calibrated annually.
9. **Calibration Procedure:** The energy meters that are main & check meters at Sakri sub-station will be tested and calibrated once in a year by MSEDCL. The testing of the meter will be jointly conducted by authorised representatives of Vestas and MSEDCL and the results and corrections so arrived at mutually will be applicable and binding on both the parties. If any of the meters is found to be registered inaccurately, the affected meter will be immediately repaired or replaced. If during the test, main meter and check meter are found beyond permissible limits of error, both the meters will be immediately repaired or replaced and the correction applied to the consumption registered by the main meter to arrive at the correct energy exported for billing purposes. Corrections in consumption registered by the main meter will be applicable to the period between the two previous monthly readings. Computation of exported energy for the period thereafter till next monthly reading will be as per the repaired or replaced meter.
10. MSEDCL allocates the reading recorded at substation to individual customer based on the site meter (LCS) reading & substation meter; as explained under heading "Description of billing calculation from main meter to individual meters."
11. This report is forwarded to MSEDCL upper authority for auditing the Joint Meter Reading (JMR) report and units recorded in that report.
12. Once the report is audited the credit note is issued by MSEDCL. Based on the credit notes, project participant's site Incharge, if authorized, will raise the invoice to MSEDCL.
13. Based on this invoice and credit note MSEDCL pays to the project proponents.

Description of billing calculation from main meter to individual meters:

The total generation reading of all windmills on the farm is collectively displayed by the substation common feeder meter. The net generation of each of the wind turbines is then calculated (as per the method notified in MERC Order dated 12/09/2006 for Group III installation machines[16]; also specified in PPA, section 11.05 – Joint Meter Reading, point [c], page 24) in the following manner:

Electricity exported by project activity to the grid is calculated as follows:

$$EG_{PP,\,export,\,app} = EG_{feeder,\,export} \times \frac{EG_{PP,\,export}}{EG_{PP,\,export} + EG_{windfarm,\,export}}$$

Electricity imported by project activity from the grid is calculated as follows:

$$EG_{PP,\,import,\,app} = EG_{feeder,\,import} \times \frac{EG_{PP,\,export}}{EG_{PP,\,export} + EG_{windfarm,\,export}}$$

Therefore, net electricity supplied to the Western regional grid i.e. EG_y is calculated as follows:

$$EG_y = EG_{PP,\,export,\,app} - EG_{PP,\,import,\,app}$$

This calculated parameter is the net electricity supplied from project activity to Western regional grid, which is used to calculate emission reduction by the project activity.

The operational and management structure basically consists of three levels:

A. Project Owner
B. Project Manager
C. Project Operator

A. Project Owner:
The project owner represents the project activity, which is Shree Jai Ambe Associates (Power Division) Management.
Their specific responsibilities:

1. Handling of the project performances
2. Keeping all the financial records of selling of electricity

B. Project Manager: Sr. Manager (Vestas Wind Technology Pvt. Ltd.).
His specific responsibilities:

1. Appointment of Project Operators
2. Ensure that Project Operators have undergone initial training to raise awareness about all processes
3. Assure that the Project Operators have received proper training regarding all the processes

C. Project Operators, (Site Engineer)
Their specific responsibilities:

[16] MERC Order dated 12/09/2006; point 07 under heading of Group Metering on page 03 http://mercindia.org.in/pdf/58_Order_dt_12_09_06_CN_10_of_2006.pdf

1. Collect/Monitor the necessary data as required by the monitoring methodology
2. Store the collected/monitored data in credit note (paper) and spread sheet (electronic)
3. Keep the record of collected/monitored data in credit note and spread sheet for two year after the end of crediting period
4. Ensure that the data is entered properly and take proper care to avoid any loss of information
5. Prepare the annual monitoring report

Training Plan:

Training of staff operating and maintaining the WEGs are carried out by the WEG manufacturer and supplier i.e. Vestas (formally NEG Micon). Special emphasis is given to the training of the employees to enable them to develop their skills to meet changing WEG technology and to provide efficient and effective O&M services.

The training programme focuses mainly on the management, monitoring and maintenance, and safety and reliability aspects of wind power. The objectives include:

1. Understanding the various stages and aspects in the management of Wind Power systems
2. Understanding the importance of monitoring and maintenance of Wind Power systems and hence the various tasks involved in this
3. Understanding the importance of safety and reliability aspects involved with Wind Power and the measures taken
4. Managing generation and other data for future reference

All the monitored data will be kept for 2 years after the end of crediting period or the last issuance of CERs for this project activity whichever occurs later. The monitored data will be presented to the DOE to whom verification of emission reductions is assigned.

B.8 Date of completion of the application of the baseline and monitoring methodology and the name of the responsible person(s)/entity(ies)

Date of completion of the baseline: 2nd November 2008

Name of the Person/Entity determining the baseline:

Mr. Milind Chittawar, Chief Consultant
Mr. Bunny Azmi, Consulting Engineer

SEE-Tech Solutions Pvt. Limited
11/5, Lets Conserve, MIDC Infotech Park,
Near VRCE Telephone Exchange, South Ambazari Road,
NAGPUR – 440 022, M.S. (INDIA),
Telephone: +91-712-2222177,
Fax: +91-712-2225293.
E-mail: seemil_ngp@sancharnet.in; chittawar@satyam.net.in
Website: www.letsconserve.org

The above entity is not a project participant.

SECTION C. Duration of the project activity / crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

30/08/2006 ('Supply Agreement' signed to buy first wind mill)

C.1.2. Expected operational lifetime of the project activity:

20 years 0 month

C.2 Choice of the crediting period and related information:

C.2.1. Renewable crediting period

Not Chosen

C.2.1.1. Starting date of the first crediting period:

Not Applicable

C.2.1.2. Length of the first crediting period:

Not Applicable

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

01/08/2009 or from the date of registration of the project activity, whichever is latter.

C.2.2.2.Length:

10 years & 0 month

SECTION D. Environmental impacts

D.1. If required by the host Party, documentation on the analysis of the environmental impacts of the project activity:

According to Indian regulation, the implementation of the wind park does not require an Environmental Impact Assessment (EIA) study. As per the prevailing regulations of the Host Party i.e. India represented by the Ministry of Environment and Forests (MoEF), Govt. of India and also the line ministry for environmental issues in India, Environmental Impact Assessment (EIA) studies need not to be conducted for the projects which comes under the list whose investment is less than Rs. 1000 millions[17, 18] Since the Wind projects are not included in this list and also the total cost of the project is only INR 153.12 Million, the project activity doesn't call for EIA study.

Also, in the redefined EIA notification i.e. S.O. 1533[19], dated 14th September 2006, Ministry of Environment & Forests (MoEF), Govt. of India, the wind projects are not included in the list of projects that has to get Prior Environmental Clearance (EC) either from State or Central Govt. authorities and hence no EIA study was conducted.

[17] S.O. 60 (E), Environment Impact Assessment Notification, Ministry of Environment and Forests, Govt. of India dated 27th January 1994.
[18] Amendments made on 13th June 2002 vide S.O. 632 (E), Ministry of Environment and Forests, Govt. of India.
[19] Page No: 10, S. O. 1533, Ministry of Environment & Forests (MoEF), Govt. of India, http://envfor.nic.in/legis/eia/so1533.pdf

SECTION E. Stakeholders' comments

E.1. Brief description how comments by local stakeholders have been invited and compiled:

Stake holder's identification:

The project proponent has identified following stakeholders while the development of the project activity.

- Local Communities
- Local governmental representatives
- Maharashtra Energy Development Agency (MEDA)
- Maharashtra State Electricity Distribution Company Limited (MSEDCL)

Stakeholder Involvement:

The project has been executed after receiving the necessary consent of the involved state government agencies, MEDA is responsible for executing the state electricity policy as per MERC (Maharashtra Electricity Regulatory Commission) for implementation of wind electric generators, whereas the MSEDCL is responsible for entering into power purchase, wheeling & banking agreements with the individual project proponents for evacuation of electricity.

As both of these agencies are under the domain of the state government, the standard application procedure followed by meeting the stipulated requirements of the state government was carried out. The final outcome of the procedure resulted in the following licenses & permissions:

- Permission to commission / implement the project
- Power Purchase Agreements between the electricity utility & project proponents and No Objection Certificate
- Commissioning & Grid Synchronization Certificates

For withdrawing comments from local stakeholders a 'survey' had been done in the month of March 2008 between 11/03/2008 to 12/03/2008 by the representative of project participants in which near by villagers had been consulted for their comments (if any) on the project activity.

E.2. Summary of the comments received:

No adverse comments were received from the government agencies / stakeholders, whereas the villagers have made following observations:

- They will continue to have the right of way in the wind farm except at places where security is required.
- The village was lacking basic amenities, and thus EPC contractor was request to consider some development of the villages.
- Employment, if possible should be given to the local villagers.

E.3. Report on how due account was taken of any comments received:

All the submissions from the villagers were considered by the management and

- The right of way was given to the villagers even after selling land to the EPC contractor.
- Employment of O&M staff up to the level of technicians (line man) and machine supervisors has been done from the local villages. Moreover, employment for security and office boy is also done from local villages.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Shree Jai Ambe Associates (Power Division)
Street/P.O.Box:	Pal Chowk, Rail Toly
Building:	Near Bank of Baroda,
City:	Gondia
State/Region:	Maharashtra.
Postfix/ZIP:	441 614
Country:	India
Telephone:	+91-7182-252510
FAX:	+91-7182-252587
E-Mail:	shreejaiambe@gmail.com
URL:	
Represented by:	
Title:	Managing Partner
Salutation:	Mr.
Last Name:	Patel
Middle Name:	Rajendrabhai
First Name:	Dharmesh
Department:	
Mobile:	09372397039
Direct FAX:	+91-7182-252587
Direct Tel:	+91-7182-252510
Personal E-Mail:	dharmesh_80@yahoo.com shreejaiambe@gmail.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

There is no public funding involved in the project activity and the project participants hereby confirm that there is no diversion of overseas development assistance.

Annex 3

BASELINE INFORMATION

CENTRAL ELECTRICITY AUTHORITY: CO2 BASELINE DATABASE

VERSION	**3.0**
DATE	**December 2007**
BASELINE METHODOLOGY	**ACM0002 / Ver 07 and "Tool to calculate the Emission Factor for an Electricity System", Version 1.1**

Weighted Average Emission Rate (tCO_2/MWh) (incl. Imports)

	2003-04	2004-05	2005-06	2006-07
North	0.71	0.72	0.73	0.74
East	1.08	1.05	1.05	1.00
South	0.84	0.79	0.74	0.72
West	0.90	0.92	0.89	0.86
North-East	0.43	0.52	0.33	0.40
India	0.85	0.84	0.81	0.80

Simple Operating Margin (tCO_2/MWh) (incl. Imports)

	2003-04	2004-05	2005-06	2006-07
North	0.99	0.98	1.00	1.00
East	1.20	1.17	1.13	1.09
South	1.00	1.00	1.01	1.00
West	0.99	1.01	1.00	0.99
North-East	0.74	0.90	0.70	0.70
India	1.02	1.02	1.02	1.01

Build Margin (tCO_2/MWh) (incl. Imports)

	2003-04	2004-05	2005-06	2006-07
North		0.53	0.60	0.63
East		0.90	0.97	0.93
South		0.70	0.71	0.71
West		0.77	0.63	0.59
North-East		0.15	0.15	0.23
India		0.69	0.68	0.68

Annex 4

MONITORING INFORMATION

The bundled project activity essentially involves generation of electricity from wind, the employed WEGs can only convert wind energy into electrical energy and cannot use any other input fuel for electricity generation. Thus no special ways and means are required to monitor leakage from the project activity. So monitoring only involves **metering the electricity generated by renewable technology**.

1. The Wind Energy generated from the WEGs has been evacuated to the Maharashtra State Grid System through the Maharashtra State Grid's sub-station (Sakri substation) and the evacuation facility is maintained by the Maharashtra State Electricity Board (MSEB).
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Description of billing calculation from main meter to individual meters:

The total generation reading of all windmills on the farm is collectively displayed by the substation common feeder meter. The net generation of each of the wind turbines is then calculated (as per the method notified in MERC Order dated 12/09/2006 for Group III installation machines; also specified in PPA, section 11.05 – Joint Meter Reading, point [c], page 24) in the following manner:

Electricity exported by project activity to the grid is calculated as follows:

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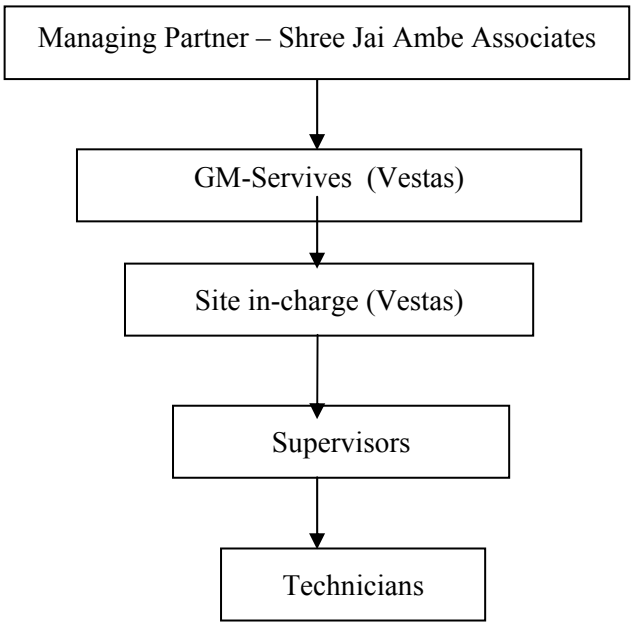
Therefore, net electricity supplied to the Western regional grid i.e. EG_y is calculated as follows:

$$EG_y = EG_{PP,\,export,\,app} - EG_{PP,\,import,\,app}$$

This calculated parameter is the net electricity supplied from project activity to Western regional grid, which is used to calculate emission reduction by the project activity.

Operation and Maintenance Structure for the 3.00 MW Wind power project by Shree Jai Ambe Associates (Power Division):-



Annex 5

CHRONOLOGY OF EVENTS

Sr	Month & Year	Activity Performed	Source
1	May 2006	Project owner / Project Participant (PP) that is Shree Jai Ambe Associates (SJAA) represented by Mr. Dharmesh had started enquiring about benefits of windmills, its dealer, its performance, etc.	Mail to Mr. Tilve (Enercon Personnel) and Mr. Dinesh (Vestas Personnel)
2	June 2006	Mr. Dharmesh had visited Mumbai office of Vestas for the detail specification of windmills of different capacity, type of agreements to be signed, site at which windmills would be installed, money that would be earned after sales of wind generated power, maintenance procedure that is to be followed, etc. On the other end PPs like Automotive Valves and M.G. Patel & Brothers had started enquiring about windmills through telephones and websites.	
3	July 2006	Mr. Dharmesh had visited Vestas windmill site at Dhule for better knowledge of the site. During this Mr. Dharmesh had also come to know about Carbon benefits from windmills and had enquired about the same with Vestas.	Mail from Mr. Ravi Chavan (Vestas Personnel)
4	August 2006	On 1st August Mr. Santonu Kashyap, Analyst – Carbon Advisory Services, Vestas has mailed Mr. Dharmesh the complete detail about CDM and carbon credits that would be created after installation of windmills. Keeping CDM in mind Shree Jai Ambe Associates had passed a Firm Resolution on 8th August 2006 for installation of 0.75 MW windmill even after knowing its high cost, low PLF for generation and low percentage of returns on investments. SJAA, M.G. Patel and Automotive Valves had received Proposal from Vestas in hard format. After receiving proposal M.G. Patel & Automotive Valves had also sought for Carbon Trade benefits from windmill as mentioned in proposal and finalized their decision by passing Firm/Board Resolution on 29th & 28th August respectively. On 30th August 2006 SJAA and M.G. Patel &	Mail received from Mr. Kashyap (Analyst – Carbon Advisory Services, Vestas). Firm Resolution. Proposals from Vestas. Firm/Board Resolution

Sr	Month & Year	Activity Performed	Source
		Brothers had signed Supply Agreement with Vestas Wind Technology Pvt. Ltd. During this period Gaysons & Company (G&C) had started their investigation on windmills and their benefits.	Supply Agreement between PPs and Vestas.
5	September 2006 to October 2006	On 2nd September Automotive Valves had signed Supply Agreement with Vestas. Finally Gayson & Company got proposal from Vestas which states a little about Carbon Trade which forced the PP to search about it and after getting comfortable feel about Carbon Trade G&C has passed Resolution to install windmill. On 19th September G&C had signed Supply Agreement with Vestas. During this time PPs had contacted bank for term loan as Vestas would be installing windmill in the month of December 2006. During all the above process PPs had also sought for the CDM Consultant so that PPs could know the actual revenue that would be generated from the project and approximate fees required to proceed. There after PPs got the idea that they alone could not go for the CDM project activity. So PPs sought for the other windmill owners with whom PPs can form bundle, that time Vestas had given idea to Mr. Dharmesh that three more machines are going to be installed at the same site and time & gave name of those companies. Mr. Dharmesh had contacted those three parties namely Automotive Valves Pvt. Ltd., M.G. Patel & Brothers and Gayson & Company Pvt. Ltd. with whom one bundle had been formed for performing bundled CDM project activity by signing "Back-to-Back" agreement on 3rd October 2006. On 25th October 2006 PPs had stopped their search for CDM Consultant by signing a Work Order with Energetic Consultancy Pvt. Ltd. for proceeding with their project as CDM Windmill Project with specified terms and conditions.	Supply Agreement between PP and Vestas. Proposal from Vestas for G&C. Board Resolution of G&C. Supply Agreement between PP and Vestas. Loan Sanction documents. Back-to-Back Agreements Proposal from Energetic. Work Order for consultancy services.
6	November 2006 to January 2007	On December 2006 PPs windmills got installed at the Dhule site.	Commissioning Report

Sr	Month & Year	Activity Performed	Source
		On 23rd January 2007 PPs windmills got commission by MSEDCL.	from MSEDCL.
		During this time PPs were in continuous contact with their hired CDM Consultant (Energetic Consultancy Pvt. Ltd.), but they came to know that there was not any progress in the project even after windmills got commissioned.	Official letter from PPs and telephonic discussion.
7	February 2007	After passing of such a long time PPs found that their hired CDM consultant had not worked according to their agreed terms & conditions. So, on 7th February 2007 PPs had cancelled their work order with Energetic Consultancy Pvt. Ltd.	Cancellation letter.
		There after PPs had tried to get proposal from different consultants for CDM activity and on 14th February they got proposal from Vestas CDM Team.	Proposal from Vestas for CDM Consultancy.
		Against this proposal PPs had raised certain queries to the consultant, which got cleared up till 21st February.	Mail from Mr. Balaji (Vestas personnel).
		PPs had realized that even with their bundle of 4 machines, the cost for CDM project activity was high and thus decided to go for larger bundle.	
		Furthermore, Vestas has informed telephonically to the PPs that Vestas CDM team had planned to form large bundle of 15 MW. Thus, PPs decided to meet other parties having their windmills on the same site to form a 15 MW bundle group for CDM activity.	Telephonic discussion with Mr. Balaji (Vestas personnel).
8	March 2007	PPs had contacted other windmill owners having their windmills on the same site of Dhule. At that time PPs had come to know that there was a dispute going on between Vestas and before 2007 commissioned windmill owners because of earliest functioning of halt and unwarranted stoppage of their WEGs by Vestas. These windmill owners had formed a "Wind Power Association" to resolve their matters with Vestas and get compensated.	Mail to Secretary Mr. Lakhanpal.
		PPs had thought that it could be the case with their windmills in future and so decided to join this association to safeguard their interests.	
9	April 2007	On 5th April 2007 PPs had joined the association.	Mail to Secretary Mr. Lakhanpal.

Sr	Month & Year	Activity Performed	Source
		In an association meeting held at Mumbai PPs came to know that all other members of the Association were not aware of Carbon Credit at that time and they had not started their CDM activity. So, PPs told them to start CDM activity by forming a larger group. On 20th April Mr. S. Balaji of Vestas had sent a draft CDM agreement to PPs for proceeding with (Vestas) their 15 MW bundle.	Mail from Mr. Balaji (Vestas Personnel).
10	May 2007	On 3rd May the management of the association had sent a CDM Negotiation Standard for forming a single decision to go with Vestas as CDM consultant or to hire some other. On 5th May the head of the Association had requested all the members for their confirmation to go as one bundle of 15 MW or not. On 17th May this association got registered with a name as – Green Power Entrepreneurs Association (GPEA) so that CDM activity can be done by one name and their matter with Vestas can be resolved. On 18th May GPEA had decided to have a meeting with Vestas CDM consultant at Delhi for negotiating on their terms & conditions. On 31st May GPEA had invited Mr. V. Badri of Vestas CDM team for a formal meet and negotiated on the price of their bundle CDM project. The price which was decided in the meeting was much less for individual parties and PPs got the benefit of bundling.	Mail to all members. Mail to all members. Mail to all members of GPEA. Mail to all members of GPEA. Mail to all members along with minutes of meeting with Mr. Badri (Vestas Personnel).
11	June 2007	On 6th June Vestas CDM team has refused to go ahead with GPEA CDM project as on one side GPEA was fighting on their matter of dispute with Vestas and another side GPEA was going with Vestas for their CDM project. So, Vestas had proposed to first resolve the matter and then they go with CDM project. After this decision from Vestas, PPs had tried to convince & request Vestas CDM team to take further PPs CDM project as PPs was not having any matter to resolve with Vestas.	Mail from Vestas CDM team to GPEA.
12	July 2007	On 17th July Vestas had accepted PPs request and asked PPs to appoint them as an independent investors apart from GPEA.	Mail from Mr. Badri (Vestas Personnel) to PP.

Sr	Month & Year	Activity Performed	Source
		So, PPs had signed an undertaking that they were appointing Vestas CDM team as independent investors on 18th July. On 30th July Vestas CDM team had sent PPs a draft copy of CDM agreement for their machines.	Mail from PPs to Mr. Badri (Vestas Personnel). Mail from Mr. Badri (Vestas Personnel) to PP.
13	September 2007	After the period of one month PPs had realized that even after signing the undertaking Vestas CDM team had not started to work on their CDM project as they are unable to form large group, thus they had not even sent final copy of CDM agreement. In the meanwhile, GPEA management had decided to force Vestas CDM team to take their bundled project as it was their right. (During this time PPs had not got apart from GPEA, they had only signed an undertaking so that their project can go ahead faster but this had not happened.)	Mail to all members of GPEA.
14	October 2007	In first week of October GPEA management had asked its member to participate in a meeting at Mumbai to some reputed CDM consultant and to give confirmation that how many parties were still ready to proceed as a single group. By that time many of the parties had left GPEA, so a new group had been formed of around 10 MW bundle capacity including PPs. On 25th October GPEA had received a proposal from FICCI – a CDM consultant team from Delhi for their 10 MW bundle windmill project.	Mail to all members of GPEA. Mail from Secretary of GPEA Mr. Lakhanpal to all members along with FICCI proposal.
15	November 2007	On 8th November GPEA had received another proposal from Price Waterhouse Coopers (PwC) CDM consultant. On 12th the Secretary of GPEA had requested its member to make him the representative of the bundle at cost of some fee by signing an agreement.	Mail from Mr. Inderjeet (PwC Personnel) along with PwC proposal. Mail to all members of GPEA.
16	December 2007	No one had agreed to sign a plain authority letter with Mr. Amit Lakhapal (Secretary of GPEA and employee of Sunstar Overseas Ltd.) as an individual person; rather everyone was willing to go for a legal agreement with the MD of Sunstar	Mail to all members of GPEA.

Sr	Month & Year	Activity Performed	Source
		Overseas Ltd, as this was a matter of long period. There were some uncomfortable & unrealistic terms raised within the group members on legal matters and moreover one of the parties of the bundle had left the group of 10 MW & started their work separately.	
17	January 2008	On 7th January one of the members of GPEA had come up with proposal from ITCOT. On 12th January PPs had come up with the name of SEE-Tech Solutions Pvt. Ltd. as CDM consultant for their bundled project. On 16th January GPEA had decided to again go with Vestas as their CDM consultant. At this point PPs had completely broken out from GPEA and search for consultant for their 4 machines only.	Mail from Mr. Rajkumar (ITCOT Personnel) to one of the member of GPEA. Mail from Mr. Milind (SEE-Tech CEO) to PPs. Mail to all members of GPEA.
18	February 2008	PPs decided to have a formal meeting with SEE-Tech Solution Pvt. Ltd. at its office. The meeting held on 14th February. After doing all the negotiation PPs had offered Work Order to SEE-Tech Solution Pvt. Ltd.	Work Order to SEE-Tech Solutions Pvt. Ltd.
19	May 2008	After working of two months, consultant had submitted Draft Report to PPs.	Mail to PP
20	June 2008	On 16th June the project had been submitted to MoEF for Host Country Approval.	
21	July 2008	On 29th July PPs had signed contract for validation of the project with SGS.	Contract copy with SGS.
22	August 2008	On 13th August MoEF had given meeting date. In the meeting MoEF had demanded some more documents so that were submitted on September.	Copy of MoEF letter for meeting.
23	September 2008	PDD for the project got web-hosted.	Copy of webpage from UNFCCC.
24	November 2008	Validation site visit had been done by DOE.	

NOTATIONS

Notation	Representing	Unit
%	Percentage	
BM	Build Margin	tCO_2/MWh
CDM	Clean Development Mechanism	
CEA	Central Electricity Authority	
CER	Certified Emissions Reduction	
CM	Combined Margin	tCO_2/MWh
CO_2	Carbon-di-oxide	
CO_2-e	CO2 equivalent	tCO_2-e
DNA	Designated National Authority	
DOE	Designated Operational Entity	
$EF_{BM, y}$	Build Margin emission factor	tCO_2/MWh
$EF_{OM, y}$	Operating Margin emission factor	tCO_2/MWh
EF_y	Emission Factor for the year	tCO_2/MWh
EIA	Environmental Impact Assessment	
EPC	Engineering, Procurement and Construction	
G&C	Gayson & Company Pvt. Ltd.	
GHG	Green House Gas	
GHG Emissions	Green House Gas Emissions	tCO_2-/year
IPCC	Intergovernmental Panel on Climate Change	
IRR	Internal rate of return	
ISO	Indian Standard Organization	
JMR	Joint Meter Reading	
Kg CO_2equ/kWh	Kilogram of CO2 equivalent per Kilo Watt Hour	
KW	Kilo Watt	
KWh	Kilo Watt hour	
LCS	Local Control System	
M & P	Modalities and Procedures	
MERC	Maharashtra Electricity Regulatory Commission	
MNRE	Ministry of New & Renewable Energy	
MSEB	Maharashtra State Electricity Board	
MSEDCL	Maharashtra State Electricity Distribution Company Limited	
MSETCL	Maharashtra State Electricity Transmission Company Limited	
MW	Mega Watt	
No.	Number	
Nos	Numbers	
NO_x	Oxides of Nitrogen	

Notation	Representing	Unit
OM	Operating Margin	tCO_2/MWh
PDD	Project Design Document	
PP	Project Proponent	
RBI	Reserve Bank of India	
SEB	State Electricity Board	
SJAA	Shree Jai Ambe Associates	
SO_x	Oxides of Sulphur	
tCO_2-e	Tonnes of CO_2 equivalent	
tCO_2-e/MWh	Tonnes of CO_2 equivalent Per Mega Watt Hour	
UNFCCC	United Nations Framework Convention on Climate Change	
w_{BM}	Default weight of Build Margin	
WEGs	Wind Electric Generators	
w_{OM}	Default weight of Operating Margin	
Yr.	Year	

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