CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-PDD)
Version 03 - in effect as of: 28 July 2006

CONTENTS

SECTION A. General description of project activity

A.1. Title of the project activity:

"Grid connected bundled wind power project in Maharashtra aggregated by Resurge Energy Private Limited".

Version: 01
Date of completion: 01 October 2008

A.2. Description of the project activity:

Purpose of the project activity

The project activity involves implementation of Wind Energy Generators (WEGs) as a voluntary measure to strengthen the NEWNE regional grid of India through environmentally benign energy generation source available to India. The project activity has been essentially developed as a bundled activity to bring down the investment requirement of the individual investors participating in the project. The investment has been carried out in various talukas in the state of Maharashtra. The districts covered under this project are Nandurbar, Dhule and Sangli. The generated electricity has been fed into the grid through the locally available evacuation facility provided by the state utility (MSEDCL)[1].

There are no GHG emissions (e.g. CO_2, CH_4, N_2O etc) from the project activity since wind energy (a zero emission source) has been used for electricity generation. However, in the baseline scenario (as per ACM 0002, version 7), there are CO_2 emissions as the equivalent amount of electricity would have been generated from fossil fuel.

Pre-project scenario: ***No Project Activity***

The NEWNE regional grid is dominated by conventional sources of energy with deficit generation during peak as well as normal operating hours of the day.

Project Scenario: ***Implementation of Project***

The project activity has been undertaken to produce 21.05 MW power through the installation of WEGs. The EPC (Engineering, Procurement & Construction**)** contractor for the project is Suzlon Energy Limited (hereinafter referred to as 'Suzlon'), which has the largest market share for supply of WEGs in India. The bundled CDM project activity has used 7 nos. of 1.5 MW WEG, 7 nos. of 1.25 MW WEG and 3 nos. 0.6 MW WEG.
The complete project activity has been connected to the grid through the locally available sub-stations owned and maintained either by the EPC contractor or the state electricity utility. The feeder and substation details have been provided in Annex 4. The project scenario therefore

[1] MSEDCL – Maharashtra State Electricity Distribution Company Limited

- Provides additional generation from a clean source of energy;
- Strengthens the regional grid (NEWNE grid of India); and
- Increases availability of electricity to the rural feeder lines / facilities during monsoon & moderate generating periods.

The Power Purchase Agreement (PPA) has been entered with MSEDCL at INR 3.50 per kWh with INR 0.15 per kWh as annual escalation. The duration of the PPA is 13 years from the date of commissioning of WEG. Details of WEGs (Identification number, Capacity and respective owner/investor) that comprise the project activity have been provided in the table below.

S.No.	WEG Identification No.	Owner	Capacity (MW)
1.	K387	Aditya Air Products Pvt. Ltd	1.25
2.	J66	BDK Engineering Industries Pvt. Ltd. (earlier BDK Process Control Pvt .Ltd.)	1.25
3.	J069	Echjay Forging Pvt. Ltd	1.25
4.	G43	Gwalior Chemical Industries Limited	1.25
5.	N275	Hind Aluminium Ind. Pvt.Ltd. (earlier Hind Aluminium)	1.5
6.	N50	Jivraj Tea Ltd.	1.5
7.	N282	Roha Dychem Pvt. Ltd.	1.5
8.	N276		1.5
9.	N277		1.5
10.	N278		1.5
11.	N279		1.5
12.	W59	Sagar Agencies Pvt Ltd	0.6
13.	GP38	Vishal Nirmiti Pvt. Ltd. (earlier - Permanent Prestress Pvt. Ltd.)	0.6
14.	GP39	Vishal Nirmiti Pvt. Ltd. (earlier - Prestress India Pvt. Ltd.)	0.6
15.	K238	Zawar Sales Pvt. Ltd. (earlier Zawar Sales Ltd.)	1.25
16.	K239		1.25
17.	K289		1.25
Total			**21.05 MW**

The CDM due diligence cost for the individual investor was high considering the investment required in obtaining the necessary advisory services for project development (PDD preparation) followed by validation by UNFCCC accredited Designated Operational Entity (DOE) and monitoring and verifications (Post Registration) before the Certified Emission Reductions (CERs) are issued to the project / investor which can be traded in the international market. It is believed that buyers with good credit rating would not be interested in procuring small volumes of CERs generated from individual WEG installations due to the higher due diligence cost associated with carrying out sellers credibility to supply CERs, large number of ERPAs (Emission Reduction Purchase Agreements) and requirement of buyer to obtain buyer country approval for individual purchase.

The investors have therefore decided to use a credible third party for bundling the project and complete the registration of all the investments as single large scale bundled project to meet the following requirements:

- Increase the GHG emission reduction volume so that major players (buyers) get attracted to buy emission reductions from the project.
- Bring down the due diligence cost / upfront investment towards project development and validation and other associated costs until the CERs are issued.

Carrying out all these activities has caused a delay in taking up this bundled initiative as a candidate CDM project.

Baseline Scenario

The baseline for the candidate CDM project has been developed in line with the approved methodology ACM 002 (version 07)[2] wherein it has been stated that the baseline scenario in case of installation of a new grid-connected renewable power plant/unit is the following:

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

Thus the baseline scenario for the project activity is the emissions generated when the same amount of electricity (generated from the project activity) would have been generated through the participating facilities of the grid energy mix.

Contribution to Greenhouse gas emissions reduction

The project activity harnesses wind energy (technology is described in detail in section A.4.3) to generate and supply electricity to the NEWNE regional electricity grid of India. The project displaces conventional / fossil fuel based electricity generation that would have otherwise been provided by the operation and expansion of the fossil fuel based power plants in NEWNE region electricity grid, thereby leading to reduction in emission of greenhouse gases (as explained in section B.3) associated with fossil fuel based electricity generation.

View of the project participant on the contribution of the project activity to sustainable development

The project proponent has essentially carried out investment in the project after analyzing the overall benefits to the community & environment. The approach is also in line with the sustainable development guidelines[3] of the Ministry of Environment & Forests (MoEF) of Government of India (GoI).

[2] http://cdm.unfccc.int/UserManagement/FileStorage/CDMWF_AM_323M30IDF1IH6AG3GRCJ4PKR9CKM7P - ACM 0002 Methodology

1. **Social well being:**

   The wind installations are carried out depending upon the wind potential of the site and thus may not be implemented close to load centers. This results in the scattered implementation of wind projects thereby resulting in strengthening of local feeders and rural grids which in turn increases the availability of electricity in the nearby villages / suburban areas.

   Implementation of the project activity will also contribute towards meeting the electricity deficit in the state of Maharashtra / NEWNE regional grid of India.

2. **Environmental well being:**

   The project activity essentially uses the available wind potential at the site which is converted into electricity; the operation of this facility is in tandem with environment as there are no emissions from the project activity.

3. **Economic well being:**

   Implementation of the project activity has helped in developing the local economy; create employment opportunities for the local skilled and semi skilled people, which is a priority concern for the Government of India.

4. **Technological well being:**

   Increased interest in wind energy projects will further push research efforts by technology providers to develop more efficient and better technology in future. Thus, the investment in candidate CDM project and other such projects will assist in promotion of better & new technologies.

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	Resurge Energy Private Limited (Private Entity)	No
(*) In accordance with the CDM modalities and procedures, 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.		

The project participant (Resurge Energy Private Limited) has been duly authorized by the individual investors to take up the said project activity for CDM project development. Resurge Energy Private

[3] http://envfor.nic.in/divisions/ccd/cdm_iac.html - Sustainable Development Guidelines by MoEF, GoI.

Limited will be responsible for all the communications with CDM-EB and Secretariat. The contact information of the project participant has been provided in Annex 1.

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

A.4.1.1. Host Party(ies):

India

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

Western region / Maharashtra

A.4.1.3. City/Town/Community etc.:

The project activity is spread over three districts namely Dhule, Nandurbar and Sangli in the state of Maharashtra.

A.4.1.4. Details of physical location, including information allowing the unique identification of this project activity (maximum one page):

The project activity is distributed throughout the three districts namely Dhule, Nandurbar and Sangli. The Latitude and Longitude of these districts has been provided in the table below:

District	Latitude	Longitude
Dhule	20° 58'	74° 47'
Nandurbar	21° 23'	74° 19'
Sangli	16° 52'	74° 36'

The location of these districts on the state map has been identified and is presented in Annex 5. These districts are well connected with major cities in Maharashtra and specific WEG locations are connected through motor-able un-matteled road. The information allowing the unique identification of the WEGs is as follows:

S. No.	WEG Identification No.	Owner	Village	Taluka	District
1	K387	Aditya Air Products Pvt.	Mandal	Nandurbar	Nandurbar

S. No.	WEG Identification No.	Owner	Village	Taluka	District
		Ltd			
2	J66	BDK Engineering Industries Pvt. Ltd.	Hatti-khurd (Brahamanwel)	Sakri	Dhule
3	J069	Echjay Forging Pvt. Ltd	Hatti-khurd (Brahamanwel)	Sakri	Dhule
4	G43	Gwalior Chemical Industries Limited	Ghatnandre	Kawathe Mahakal	Sangli
5	N275	Hind Aluminium Ind. Pvt.Ltd.	Narsewadi	Tasgaon	Sangli
6	N50	Jivraj Tea Ltd.	Garjewadi (Dhalgaon)	Kawathe Mahankal	Sangli
7	N282	Roha Dychem Pvt. Ltd.	Ghoti Budhrukh	Tasgaon	Sangli
8	N276		Narsewadi	Tasgaon	Sangli
9	N277				
10	N278				
11	N279				
12	W59	Sagar Agencies Pvt Ltd	Tisangi (Dhalgaon)	Kavathemahakal	Sangli
13	GP38	Vishal Nirmiti Pvt. Ltd.	Panumbre	Shirala	Sangli
14	GP39				
15	K238	Zawar Sales Pvt. Ltd	Titane	Sakri	Dhule
16	K239				
17	K289				

A.4.2. Category(ies) of project activity:

The project activity is applicable to 'Scope Number 1, Sectoral Scope – Energy industries (renewable/non-renewable sources).

As per the list of categories advised by UNFCCC, the **project activity conforms to category no. 1** since it involves generation of energy (electricity) using wind energy (renewable source) conversion systems.

A.4.3. Technology to be employed by the project activity:

Pre-project scenario: *No Project Activity*

The NEWNE regional grid of India was operating / generating through the grid energy mix of the facilities implemented and is dominated by conventional sources of energy with deficit generation during peak as well as normal operating hours of the day.

Project scenario:

The project activity involves installation of 17 no. of WEGs of varying capacities (0.6 MW, 1.25 MW and 1.5 MW). The WEGs implemented in this project has been supplied by Suzlon as complete unit without any technology transfer. The post implementation operation and maintenance is also being carried out by Suzlon, which ensures professional site management and allied services.

The project uses technology that is environmentally clean as there are no GHG emissions from the generation of electricity from WEGs. Also, there is no technology transfer involved in the project activity. The technical specifications of the WEG models (S-70, S-80 and S-52) employed in the project activity have been furnished below:

Operating Data	**S-70**	**S-82**	**S-52**
Rotor			
Rotor diameter	70 m	82 m	52 m
No. of blades	3	3	3
Swept area m^2	3750	5281	2124
Hub height	75 m	78.3 m	75 m
Regulation	Pitch regulated	Pitch regulated	Pitch regulated
Operational Data			
Cut-in wind speed	3 m/s	4 m/s	3.5 m/s
Rated wind speed	12 m/s	12.5 m/s	12 m/s
Cut-out wind speed	20 m/s	20.3m/s	25 m/s
Gear Box			
Type	3 stage gear box, 1 planetary and 2 helical	3 stage gear box, 1 planetary and 2 helical	Integrated 3 Stage 1 planetary & 2 helical
Type of cooling	Oil cooling system	Oil cooling system	Oil cooling system
Generator			
Type	Asynchronous	Asynchronous	Asynchronous
Rated Output	1250 kW	1500 kW	600 kW
Rated voltage	690 V	690 V	690 V
Frequency	50 Hz	50 Hz	50 Hz
Cooling system	Air cooled	Air cooled	Air cooled
Yaw System			
Bearing type	Polyamide slide bearing	Polyamide slide bearing	Polyamide slide bearing

The project activity essentially involves:

Components

1. 17 WEGs of varying specifications supplied by Suzlon with a generating capacity of 1.25 MW, 1.5 MW and 0.6 MW respectively;
2. Step up transformers; and
3. Transmission lines connecting the generating facility to the local sub-station.

Emissions

1. Additional GHG emissions due to project activity – Nil / Not measurable.
2. Additional Non-GHG emissions due to project activity – Nil / Not measurable

In absence of the project activity, the same amount of generation would have happened through conventional sources of energy which would have resulted in consumption of fossil fuel (since the NEWNE regional grid is dominated by conventional generating facilities).

For maintaining the same level of services / end product availability (electricity in this case), additional GHG emission would have happened in business as usual scenario.

A.4.4. Estimated amount of emission reductions over the chosen crediting period:

The estimated emission reductions over the 10 year fixed crediting period would be **3,34,196 tCO_2e** as per details on annual emission reductions provided below:

Years	Annual estimation of emission reduction in tons of CO_2e
01/05/2009 – 30/04/2010	33,420
01/05/2010 – 30/04/2011	33,420
01/05/2011 – 30/04/2012	33,420
01/05/2012 – 30/04/2013	33,420
01/05/2013 – 30/04/2014	33,420
01/05/2014 – 30/04/2015	33,420
01/05/2015 – 30/04/2016	33,420
01/05/2016 – 30/04/2017	33,420
01/05/2017 – 30/04/2018	33,420
01/05/2018 – 30/04/2019	33,420
Total estimated reductions (tons of CO_2e)	**3,34,196**
Total number of crediting years	**10**
Annual average over the crediting period of estimated reductions (tons of CO_2e)	**33,420**

A.4.5. Public funding of the project activity:

No public funding or Official Development Assistance (ODA) has been used on this 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 project activity:

Title: Consolidated baseline and monitoring methodology for "Grid-connected electricity generation from renewable sources"

Reference: Consolidated baseline methodology ACM0002 (Version 07, EB 36)

ACM0002 draws upon the following tools which have been used in the PDD:

- Tool to calculate the emission factor for an electricity system – Version 01.1, EB 35
- Tool for the demonstration and assessment of additionality – Version 05.2, EB 39
- Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion - Version 02, EB 41

B.2. Justification of the choice of the methodology and why it is applicable to the project activity:

The approved consolidated baseline and monitoring methodology ACM0002, Version 07 is the choice of the baseline and monitoring methodology and it is applicable because:

S. No.	Applicability conditions of ACM0002	Project Under Consideration
1.	Methodology is applicable to electricity capacity additions from: 1. Run-of-river hydro power plants; hydro power projects with existing reservoirs where volume of the reservoir is not increased 2. Wind Sources 3. Geothermal Sources 4. Solar Sources 5. Wave and tidal sources	The project represents electricity capacity additions from wind sources
2.	Methodology is not applicable to project activities that involve switching from fossil fuels to renewable energy at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site.	The project does not involve switching from fossil fuel to renewable energy at the site of project activity since the Project is green-field electricity generation capacities from wind sources at sites where there was no electricity generation source prior to the Project.
3.	The Methodology is applicable when the geographic and system boundaries for the relevant electricity grid	The geographical and system boundaries of the NEWNE

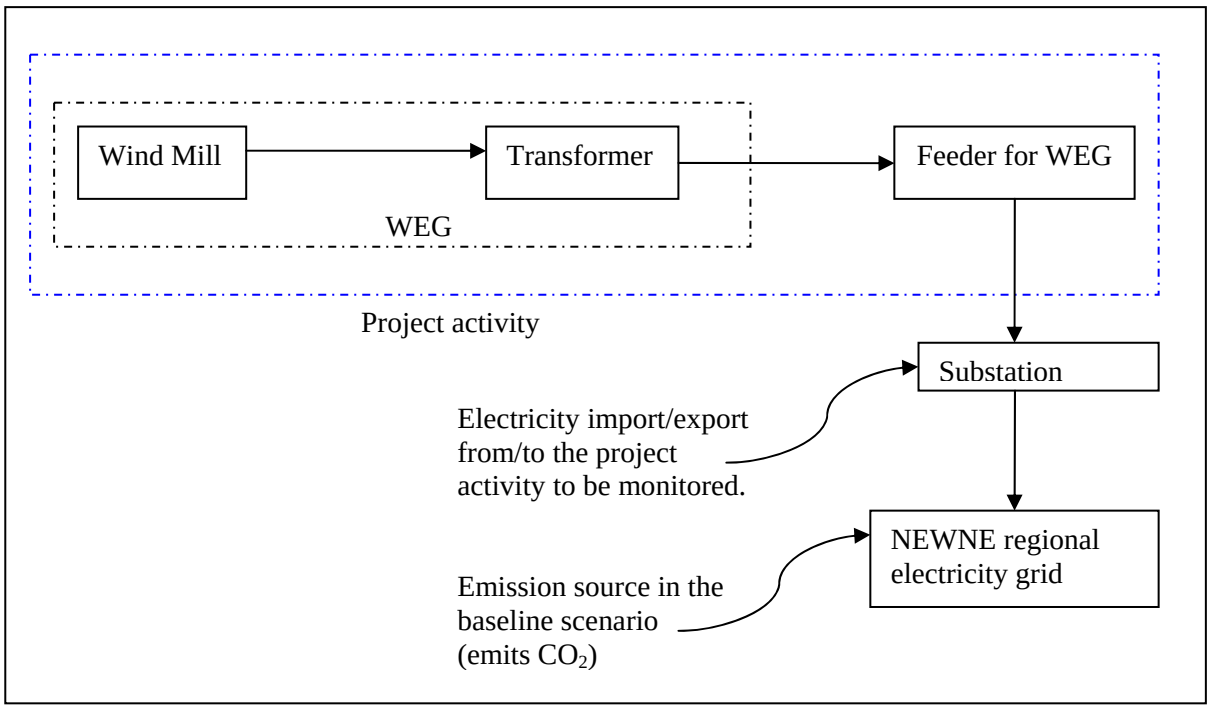
S. No.	Applicability conditions of ACM0002	Project Under Consideration
	can be clearly identified and information on the characteristics of the grid is available	electricity grid can be clearly identified and information on the characteristics of the grid is available.

The details above justify the applicability of ACM 0002 for this project.

B.3. Description of the sources and gases included in the project boundary:

	Source	Gas	Included?	Justification/Explanation
Baseline	Grid-connected electricity generation	CO_2	Yes	In the baseline scenario the electricity would have been sourced from the NEWNE grid which in turn would be connected to fossil fuel fired power plants which emit CO_2.
		CH_4	No	No methane generation is expected to be emitted.
		N_2O	No	No nitrous oxide generation is expected to be emitted.
Project Activity	Greenfield wind energy conversion system	CO_2	No	The project activity does not emit any emissions.
		CH_4	No	No methane generation is expected to be emitted.
		N_2O	No	No nitrous oxide generation is expected to be emitted.

Flow Diagram of the project boundary:



Represents project activity

Represents 1 unit of WEG

Represents project boundary

B.4. Description of how the baseline scenario is identified and description of the identified baseline scenario:

The baseline for the candidate CDM project has been developed in line with the approved methodology ACM 002 (version 07)[4] wherein it has been stated that the baseline scenario in case of installation of a new grid-connected renewable power plant/unit is the following:

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

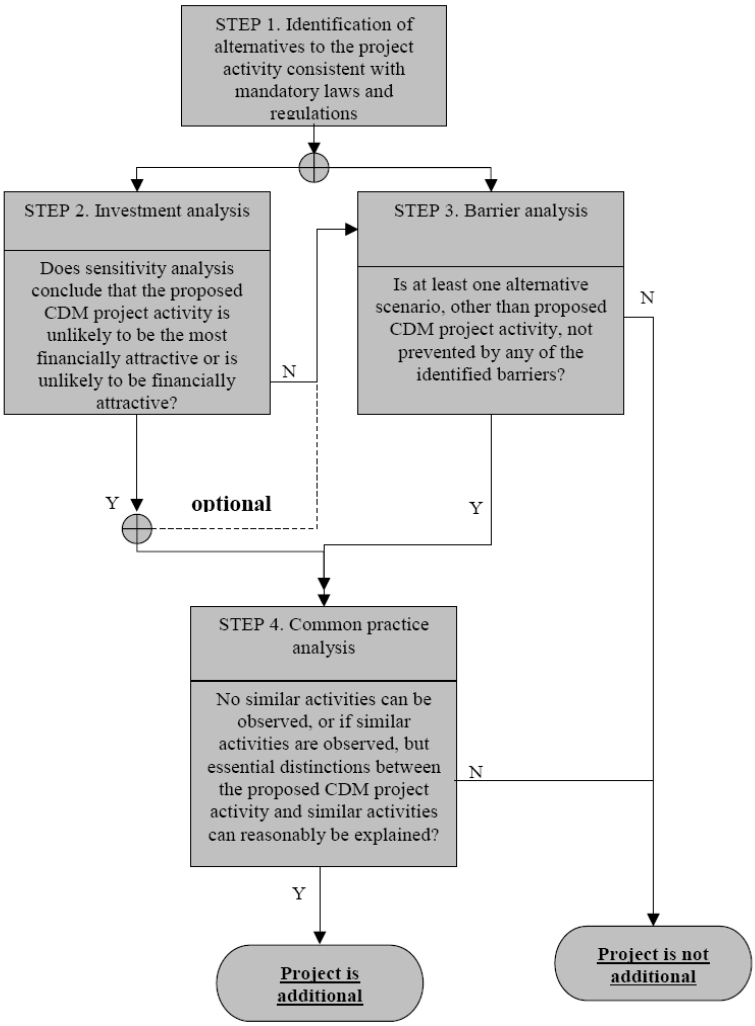
As the project activity involves installation of new grid-connected wind power plant, the baseline scenario is the emissions generated by the operation of grid connected power plants and by addition of new generation sources.

[4] http://cdm.unfccc.int/UserManagement/FileStorage/CDMWF_AM_323M30IDF1IH6AG3GRCJ4PKR9CKM7P - ACM 0002 Methodology

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 CDM project activity (assessment and demonstration of additionality):

Demonstrating additionality of the project:

According to decision 17/CP.7 paragraph 43, a project will be defined additional if the anthropogenic GHG emissions from the source are reduced below that would have occurred in the absence of the registered project activity. Within the scope of the adopted baseline methodology (ACM 0002), the additionality of the project activity has been demonstrated and assessed using the latest version of the "Tool for the demonstration and assessment of additionality" (Version 05.2 from EB 39). The tool prescribes the following steps for proving additionality of a project.



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

The different potential alternative(s) to the project activity are as follows:

Alternative 1- Implementation of WEGs undertaken without CDM revenue

The project activity is not viable enough without CDM revenues. This argument has been discussed at length in step 2 of the additionality. Although this alternative is in compliance with all the regulatory and legal norms, it is not possible for execution because of financial barriers.

Alternative 2- Implementation of conventional electricity generation project

Although there was a possibility of developing a conventional fossil fuel based project for strengthening the grid, but in this case, the investment has been carried out by individual investors. Thus an equivalent conventional unit is not feasible / practical alternative.

Alternative 3- No project activity; Continuation of current situation

The project proponent would have continued without investment in project and would have continued with usual business activities.

Since step 1 is satisfied, the tool for demonstration and assessment of additionality mandates to proceed to **step 2** or **step 3**

Step 2. Investment analysis

Determine whether the proposed project activity is economically or financially less attractive than at-least one other alternative, identified in step 1, without the revenue from the sale of certified emission reductions (CERs). To conduct the investment analysis, use the following sub-steps:

Sub Steps	Tool Guidelines	Submissions in favor of additionality
Sub-step 2a. - Determine appropriate analysis method	Determine whether to apply simple cost analysis, investment comparison analysis or benchmark analysis (sub-step 2b). If the CDM project activity generates no financial or economic benefits other than CDM related income, then apply the simple cost analysis (Option I). Otherwise, use the investment comparison analysis (Option II) or the benchmark analysis (Option III).	The project generates electricity which is supplied to the grid and a PPA has been entered with the state electricity utility for payment of the supplied electricity that is received against the Joint Meter Reading (JMR) on monthly basis. The other possible revenue stream for the project is through trading of GHG emission reductions in Annex-1 countries. Thus Option-1 is not applicable for this project and Option-II or Option-III should be used.
Sub-step 2b. – Option II. Apply investment comparison analysis	Identify the financial indicator, such as IRR, NPV, cost benefit ratio, or unit cost of service (e.g., levelized cost of electricity production in $/kWh or levelized cost of delivered heat in $/GJ)	Project proponent chooses to exercise option-III i.e. Benchmark analysis.

Sub Steps	Tool Guidelines	Submissions in favor of additionality
	most suitable for the project type and decision-making context.	
Sub-step 2b. – Option III. Apply benchmark analysis	Identify the financial indicator, such as IRR, NPV, cost benefit ratio, or unit cost of service (e.g., levelized cost of electricity production in $/kWh or levelized cost of delivered heat in $/GJ) most suitable for the project type and decision context.	Project IRR has been considered as appropriate financial indicator for comparison with the benchmark (WACC).

The guidance to investment analysis issued in EB 41 (paragraph 11) states that in cases where a benchmark approach is used the applied benchmark shall be appropriate to the type of IRR calculated. Weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR. Required/expected returns on equity are appropriate benchmarks for equity IRR.

The tool for demonstration and assessment of additionality [para-5, sub step 2(b)] states that in cases where the project has more than one potential developer, the benchmark shall be based on parameters that are standard in the market, considering the specific characteristics of the project type. Accordingly, the weighted average cost of capital applicable to the project type has been considered as the benchmark.

The benchmark WACC for the project is 11.17%.

Sub-step 2c. Calculation and comparison of financial indicators (only applicable to options II and III):

1. Calculate the suitable financial indicator for the proposed CDM project activity and, in the case of Option II above, for the other alternatives. Include all relevant costs (including, for example, the investment cost, the operations and maintenance costs), and revenues (excluding CER revenues, but including subsidies/fiscal incentives where applicable), and, as appropriate, non-market cost and benefits in the case of public investors.
2. Present the investment analysis in a transparent manner and provide all the relevant assumptions in the CDM-PDD, so that a reader can reproduce the analysis and obtain the same results. Clearly present critical techno-economic parameters and assumptions (such as capital costs, fuel prices, lifetimes, and discount rate or cost of capital). Justify and/or cite assumptions in a manner that can be validated by the DOE. In calculating the financial indicator, the project's risks can be included through the cash flow pattern, subject to project-specific expectations and assumptions (e.g. insurance premiums can be used in the calculation to reflect specific risk equivalents).
3. Assumptions and input data for the investment analysis shall not differ across the project activity and its alternatives, unless differences can be well substantiated.
4. Present in the CDM-PDD submitted for validation a clear comparison of the financial indicator for the proposed CDM activity and:
    (a) The alternatives, if Option II (investment comparison analysis) is used. If one of the other alternatives has the best indicator (e.g. highest IRR), then the CDM project activity can not be considered as the most financially attractive;
    (b) The financial benchmark, if Option III (benchmark analysis) is used. If the CDM project activity has a less favourable indicator (e.g. lower IRR) than the benchmark, then the CDM project activity cannot be considered as financially attractive.

The financial analysis for calculating post-tax project IRR has been carried out based on the data available at the time of taking investment decision of the project. The table below summarises the key assumptions used for calculating the IRR and the reason of deviation of this value from the MERC tariff order value (if applicable).

Project Operation Parameters	**MERC assumption in tariff order dated 24.11.2003**	**Values used**	**Reason for not adopting MERC value**
Capital Cost	INR 40 million / MW	Various	EPC offer was the actual project implementation cost.
Plant Load Factor / Capacity Utilization Factor	20%	MERC Value	-
Operation & Maintenance Cost as % of capital cost	For first 3 years - 1.5% of the total cost For 4th year – 2% of the total cost From 5th year – annual escalation of 5% over the previous year	Various	Agreement with EPC contractor – Suzlon and Insurance service provider was available.
Debt:Equity Ratio	70:30	Actuals and MERC Value	If start date is the Financial Closure date then actual figures are taken. However, if Financial Closure is achieved after the P.O., then MERC value has been taken.
Rate of interest on Debt	12.5%	Actual or Normative	-
Loan Tenure	10 years	MERC value	-
Tariff for 1st year	INR 3.50 per kWh	MERC value	-
Annual escalation in tariff for a period of 13 years	INR 0.15 per kWh	MERC value	-
PPA duration	13 years	MERC value	-
Income Tax Depreciation Rate (Written Down Value basis)			
On WEGs	-	80%	As per Income tax Act
On Landlease hold	-	0	As per Income tax Act
On Building and site Development	-	10%	As per Income tax Act
On other assets	-	10.00%	As per Income tax Act
Book Depreciation Rate (Straight Line Method basis)			
On WEGs	-	5.28%	As per SLM of Depreciation
On Landlease hold	-	0%	As per SLM of Depreciation
On Buildng and site development	-	3.34%	As per SLM of Depreciation

Project Operation Parameters	MERC assumption in tariff order dated 24.11.2003	Values used	Reason for not adopting MERC value
On Furniture and fixtures	-	6.33%	As per SLM of Depreciation
On other Assets	-	6.33%	As per SLM of Depreciation
Working Capital Requirements (Days)			
Receivables (Sale of electricity)	-	45 days	CERC Order
O & M Expenditure to be paid in advance	-	30	CERC Order
Working Capital Interest Rate	-	11.75%	PLR from weekly Statistical Suppliment from RBI

The other key assumptions used for calculating the IRR are summarized in the table below:

Parameter	Value Used	Source
Income Tax rate	30%	Income Tax Act
Minimum Alternate Tax	10%	Income Tax Act
Surcharge	10%	Finance Bill (Union Budget)
Cess	2%	Finance Bill(Union Budget)
Baseline Emission Factor	906.18 tCO_2/GWh of electricity generated	CEA database for grid baseline version IV (September 2008)

On the basis of above assumptions, the investments made by various investors have resulted in following returns / financial indicators.

S.No.	Owner	Post-tax Project IRR (%)
1	Aditya Air Products Pvt. Ltd	7.00
2	BDK Engineering Industries Pvt. Ltd. (earlier BDK Process Control Pvt .Ltd.)	7.36
3	Echjay Forging Pvt. Ltd	7.26
4	Gwalior Chemical Industries Limited	6.83
5	Hind Aluminium Ind. Pvt.Ltd. (earlier Hind Aluminium)	5.11
6	Jivraj Tea Ltd.	5.82
7	Roha Dychem Pvt. Ltd.	4.83
8	Sagar Agencies Pvt Ltd	6.36
9	Vishal Nirmiti Pvt. Ltd. (earlier - Permanent Prestress Pvt. Ltd.)	6.33
10	Vishal Nirmiti Pvt. Ltd. (earlier - Prestress India Pvt. Ltd.)	6.33
11	Zawar Sales Pvt. Ltd (earlier Zawar Sales Ltd.)	6.85

The table clearly indicates that the returns of various investors from the investment is much below the benchmarks established by WACC (11.17% project IRR)

Sub-step 2d. Sensitivity analysis (only applicable to options II and III):

Include a sensitivity analysis that shows whether the conclusion regarding the financial attractiveness is robust to reasonable variations in the critical assumptions. The investment analysis provides a valid argument in favor of additionality only if it consistently supports (for a realistic range of assumptions) the conclusion that the project activity is unlikely to be the most financially attractive (as per step 2c para 8a) or is unlikely to be financially attractive (as per step 2c para 8b).

It is expected that there could be a possible 10% generation difference (both on the higher as well as lower side) during the normal operational life of the project activity. Thus, sensitivity analysis has been carried out at ±10% variation in PLF. The figures given below are without consideration of CDM revenues.

Sensitivity analysis for project IRR has been done on BDK Engineering Industries Pvt. Ltd. as it has the highest project IRR among all investors.

For Sagar Agencies Pvt. Ltd.:

Plant Load Factor	**Project IRR (Post Tax)**
18% (10% reduction in PLF)	6.22%
22% (10% increase in PLF)	8.48%

It is clearly evident that the project returns are below the WACC benchmark and thus additional support through CDM registration is required for the project.

Step 4. Common practice analysis

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

1. Provide an analysis of any other activities implemented previously or currently underway that are similar to the proposed project activity. Projects are considered similar if they are in the same country/region and/or rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc. Other CDM project activities are not to be included in this analysis. Provide quantitative information where relevant.

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

2. If similar activities are widely observed and commonly carried out, it calls into question the claim that the proposed project activity is financially unattractive (as contended in Step 2) or faces barriers (as contended in Step 3). Therefore, if similar activities are identified above, then it is necessary to demonstrate why the existence of these activities does not contradict the claim that the proposed project activity is financially unattractive or subject to barriers. This can be done by comparing the proposed project activity to the other similar activities, and pointing out and explaining essential distinctions between them that explain why the similar activities enjoyed certain benefits that

rendered it financially attractive (e.g., subsidies or other financial flows) or did not face the barriers to which the proposed project activity is subject.

3. Essential distinctions may include a serious change in circumstances under which the proposed CDM project activity will be implemented when compared to circumstances under which similar projects where carried out. For example, new barriers may have arisen, or promotional policies may have ended, leading to a situation in which the proposed CDM project activity would not be implemented without the incentive provided by the CDM. The change must be fundamental and verifiable.

Investment by private sector in electricity generation is not mandatory in India. Typically wind energy projects are being implemented in 8 states of India wherein additional support is extended by the state governments (in the form of preferential tariffs as mentioned in clause 86.1(E) of the Indian Electricity Act 2003). India being the only country with a special ministry for promotion of renewable and non-conventional technologies, such efforts / promotional benefit is offered to private investors for more than 15 years now.

The candidate CDM project has been implemented in the financial year 2006-07. Thus, we present here the wind project installations in the state of Maharashtra till the end of financial year 2005-06 (Source: *http://www.windpowerindia.com/statyear.html*).

S. No.	Year	Wind project installations (MW)
1.	Up to 1992	1.10
2.	1992 – 93	0.00
3.	1993 – 94	0.00
4.	1994 – 95	1.50
5.	1995 – 96	0.00
6.	1996 – 97	2.77
7.	1997 – 98	0.23
8.	1998 – 99	23.34
9.	1999 – 00	50.35
10.	2000 – 01	110.6
11.	2001 – 02	209.4
12.	2002 – 03	2.00
13.	2003 – 04	6.30
14.	2004 – 05	48.8
15.	2005 – 06	545.1
16.	2006 – 07	483.6

The table above demonstrates that the total installations of wind power project in Maharashtra upto year 2005-06 was 1001.48 MW. Also, the total installed capacity on the same date was 16156.73 MW (Source: CEA Anuual Report 2005-06, Annexure-10-B). Further to this, if the generation contribution is estimated, the total energy available in the state as on 31.03.2005 (latest data available in public domain) was 82075.33 GWh (Source: Table No. 5.3, CEA General Review 2006) of which only 495.36 GWh (Source: Table No. 5.5, CEA General Review 2006) was contributed by renewable energy, making it 0.6% of the total energy available in the state.

Also, from the table above, a comparison of installed capacities of wind generation sources between year 2002 and 2007 indicates that during this period about 1085.8 MW of wind generating capacity was added in Maharashtra. These installations came during the time when the Government of India ratified the Kyoto Protocol and investors across the country became aware of the additional revenue benefits that could be accrued to them for investment in cleaner technology. Thus, investment in wind energy accelerated in India beginning from year 2002, and project promoters relied on the potential carbon revenue to strengthen the finances and uncertain returns from projects of this nature. Therefore wind power project development is substantially dependent on CDM and thus is not a common practice.

Sub-steps 4a and 4b are satisfied.

The financial analysis carried out for the project as well as the practical situation in the state of Maharashtra clearly justify that neither the projects are able to provide necessary returns to the investors nor the implementation of wind energy installations has become a common practice in the state of Maharashtra.

There 4a and 4b are satisfied and hence the project activity is additional.

Demonstrating the seriousness of CDM consideration:

The starting date of the project activity is before the date of validation; however CDM revenue was a serious consideration in the decision to implement the project activity. The table below demonstrates the dates when CDM revenue was first considered by the individual project investors, the corresponding dates of purchase orders placed with the EPC contractor after the impact of CDM revenue on the financial feasibility of the project activity was evaluated and the corresponding dates of commissioning.

S.No.	Name of Sponsor	CDM Consideration date	PO date	Date of Commissioning
1	Aditya Air Products Pvt. Ltd	12-Sep-05	20-Jul-06	26-Sep-06
2	BDK Engineering Industries Pvt. Ltd. (earlier) BDK Process Control Pvt .Ltd.)	9-Jun-06	23-Jun-06	30-Sep-06
3	Echjay Forging Pvt. Ltd	13-Apr-06	24-Jun-06	18-Nov-06
4	Gwalior Chemical Industries Limited	3-Oct-06	22-Feb-07	31-Mar-07
5	Hind Aluminium Ind. Pvt.Ltd. (earlier Hind Aluminium)	22-Dec-05	27-Nov-06	25-Mar-07
6	Jivraj Tea Ltd.	3-Apr-06	7-Jul-06	19-Oct-06
7	Roha Dychem Pvt. Ltd.	25-Jul-06	16-Oct-06	29-Mar-07
8	Sagar Agencies Pvt Ltd	4-Oct-06	23-Nov-05	31-May-06
9	Vishal Nirmiti Pvt. Ltd. (earlier - Permanent Prestress Pvt. Ltd.)	4-Jul-06	2-Sep-06	30-Dec-06
10	Vishal Nirmiti Pvt. Ltd. (earlier - Prestress India Pvt. Ltd.)	4-Jul-06	2-Sep-06	30-Dec-06
11	Zawar Sales Pvt. Ltd (earlier Zawar Sales Ltd.)	6-Jun-06	8-Jul-06	30-Sep-06

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

According to the approved methodology ACM0002 (version 07) Emission Reductions are calculated as

$$\mathbf{ER_y = BE_y - PE_y - L_y}$$

Where:

BE_y	Baseline Emissions in year *y* (t CO_2e/yr)
PE_y	Project Emissions in year *y* (t CO_2e/yr)
L_y	Leakage Emissions in year *y* (t CO_2e/yr)

Estimation of Baseline Emissions

Baseline emissions (BE_y in tCO_2) due to displacement of grid-electricity is calculated as the product of the Baseline Emissions Factor (EF_y in tCO_2/MWh) calculated as described below and the electricity supplied by the project activity to the grid (EG_y - $EG_{baseline}$ in MWh), over the crediting period.

$$\mathbf{BE_y = (EG_y - EG_{baseline}) \; X \; EF_y}$$

Where:

BE_y	Baseline emissions in year y (tCO2/yr)
EG_y	Electricity supplied by the project activity to the grid (MWh)
$EG_{baseline}$	Baseline electricity supplied to the grid in the case of modified or retrofit facilities (MWh). For new power plants this value is taken as zero. As this is a new power plant this is zero for the project activity.
EF_y	Combined margin CO_2 emission factor for grid connected power generation in year y calculated using "Tool to calculate the emission factor for an electricity system, Version 1, EB 35"

According to the tool the baseline emission coefficient will be determined using the following steps:

STEP 1. Identifying the relevant electric power system

The Indian electricity system is divided into two regional grids, viz. NEWNE (North, East, West, Northeast) and southern grid. Each grid covers several states.

The regional grids are interconnected, there is inter-state and inter-regional exchange. A small power exchange also takes place with neighboring countries like Bhutan and Nepal. 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 regional problems relating to the grid. Each state in a regional grid meets its demand with its own generation facilities and also with allocation from power plants owned by the Central Sector such as NTPC and NHPC etc. Specific quotas are allocated to each state from the Central Sector power plants. Depending on the demand and generation, there are electricity exports and imports between states in the regional grid. The regional grid thus represents the largest electricity grid where power plants can be dispatched without significant constraints and thus, represents the "project electricity system" for the Project.

As the Project is connected to the NEWNE electricity grid, the NEWNE grid is the "project electricity system".

STEP 2. Select an operating margin (OM) method
According to the tool the calculation of the operating margin emission factor is based on one of the following methods:

(a) Simple OM, or
(b) Simple adjusted OM, or
(c) Dispatch data analysis OM, or
(d) Average OM.

Any of the four methods can be used, however, the simple OM method (option a) can only be used if low cost/must-run resources constitute less than 50% of total grid generation in: 1) average of the five most recent years, or 2) based on long-term averages for hydroelectricity production.

The Share of Low Cost / Must-Run (% of Net Generation) in the generation profile of the different grids in India in the last five years is as follows[5]:

	2005-06	2006-07	2007-08
NEWNE	18.0%	18.5%	19.0%
South	27.0%	28.3%	27.1%
India	20.1%	20.9%	27.1%

The above data clearly shows that the percentage of total grid generation by low cost/must run plants (on the basis of average of five most recent years) for the NEWNE regional grid is less than 50% of the total generation. Hence the Simple OM method can be used to calculate the Operating Margin Emission factor.

The project proponents choose an ex ante option for calculation of the OM with a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation, without requirement to monitor and recalculate the emissions factor during the crediting period.

STEP 3. Calculate the operating margin emission factor according to the selected method
The simple OM emission factor is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO_2/MWh) of all generating power plants serving the system, not including low-cost / must-run power plants / units. It may be calculated:

- Based on data on fuel consumption and net electricity generation of each power plant / unit (Option A), or
- Based on data on net electricity generation, the average efficiency of each power unit and the fuel type(s) used in each power unit (Option B), or
- Based on data on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system (option C)

[5] http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm Baseline Carbon Dioxide Emission Database Version 4.0 - LATEST

The Central Electricity Authority, Ministry of Power, Government of India has published a database of Carbon Dioxide Emission from the power sector in India based on detailed authenticated information obtained from all operating power stations in the country. This database i.e. The CO2 Baseline Database provides information about the Combined Margin Emission Factors of all the regional electricity grids in India. The Combined Margin in the CEA database is calculated ex ante using the guidelines provided by the UNFCCC in the "Tool to calculate the emission factor for an electricity system". We have, therefore, used the Combined Margin data published in the CEA database, for calculating the Baseline Emission Factor.

The CEA database uses the option B i.e. data on net electricity generation, the average efficiency of each power unit and the fuel type(s) used in each power unit, to calculate the OM of the different regional grids.
The simple OM emission factor is calculated based on the electricity generation of each power unit and an emission factor for each power unit, as follows:

$$\mathbf{EF_{grid,OMsimple,y} = \Sigma\ (EG_{m,y}\ x\ EF_{EL,m,y}) / \Sigma EG_{m,y}}$$

where:

$EF_{grid,OMsimple,y}$	Simple operating margin CO_2 emission factor in year y (tCO_2/MWh)
$EG_{m,y}$	Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
$EF_{EL,m,y}$	CO_2 emission factor of power unit m in year y (tCO_2/MWh)
m	All power units serving the grid in year y except low-cost / must-run power units y Either the three most recent years for which data is available at the time of submission of the CDM PDD to the DOE for validation (ex ante option) or the applicable year during monitoring (ex post option), following the guidance on data vintage in step 2

The emission factor of each power unit m has been determined using Option B1

$$\mathbf{EF_{EL,m,y} = (\Sigma\ FC_{i,m,y}\ x\ NCV_{i,y}\ x\ EF_{CO2,I,y}) / EG_{m,y}}$$

where:

$EF_{EL,m,y}$	CO_2 emission factor of power unit m in year y (tCO_2/MWh)
$FC_{i,m,y}$	Amount of fossil fuel type i consumed by power unit m in year y (Mass or volume unit)
$NCV_{i,y}$	Net calorific value (energy content) of fossil fuel type i in year y (GJ / mass or volume unit)
$EF_{CO2,I,y}$	CO_2 emission factor of fossil fuel type i in year y (tCO_2/GJ)
$EG_{m,y}$	Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
m	All power units serving the grid in year y except low-cost / must-run power units
i	All fossil fuel types combusted in power unit m in year y
y	Either the three most recent years for which data is available at the time of submission of the CDM-PDD to the DOE for validation (ex ante option) or the applicable year during monitoring (ex post option), following the guidance on data vintage in step 2

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

The sample group of power units m used to calculate the build margin consists of either:

(a) The set of five power units that have been built most recently, or

(b) The set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently.

Project participants should use the set of power units that comprises the larger annual generation. Accordingly, the CEA database calculates the build margin as the average emissions intensity of the 20% most recent capacity additions in the grid based on net generation.

The build margin emission factor has been calculated ex-ante based on the most recent information available on units already built for sample group m at the time of CDM-PDD submission to the DOE for validation. This option does not require monitoring the emission factor during the crediting period.

STEP 5. Calculate the build margin emission factor

The build margin emissions factor is the generation-weighted average emission factor of all power units m during the most recent year y for which power generation data is available, calculated as follows:

$$\mathbf{EF_{grid,BM,y} = (\Sigma\ EG_{m,y}\ x\ EF_{EL,m,}\ ) / \Sigma\ EG_{m,y}}$$

Where:

$EF_{grid,BM,y}$	Build margin CO_2 emission factor in year y (tCO_2/MWh)
$EG_{m,y}$	Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
$EF_{EL,m,y}$	CO_2 emission factor of power unit m in year y (tCO_2/MWh)
m	Power units included in the build margin
y	Most recent historical year for which power generation data is available

The CO_2 emission factor of each power unit m ($EF_{EL,m,y}$) is determined as per the procedures given in step 3 (a) for the simple OM, using options B1 using for *y* the most recent historical year for which power generation data is available, and using for *m* the power units included in the build margin.

STEP 6. Calculate the combined margin emissions factor

The emission factor *EFy* of the grid is represented as a combination of the Operating Margin (OM) and the Build Margin (BM). Considering the emission factors for these two margins as $EF_{OM,y}$ and $EF_{BM,y}$, then the *EFy* is given by:

$$\mathbf{EF}y = w_{OM} * \mathbf{EF_{grid,OM,}}y + w_{BM} * \mathbf{EF_{grid,BM,}}y$$

Where:

$EF_{grid,BM,y}$	Build margin CO_2 emission factor in year y (tCO_2/MWh)
$EF_{grid,OM,y}$	Operating margin CO_2 emission factor in year y (tCO_2/MWh)
w_{OM}	Weighting of operating margin emissions factor (%)
w_{BM}	Weighting of build margin emissions factor (%) (where $w_{OM} + w_{BM} = 1$).

According to ACM0002, version 7, the weights for OM and BM are 0.75 and 0.25 respectively.

Using the values for operating and build margin emission factor provided in the CEA database and their respective weights for calculation of combined margin emission factor, the **baseline carbon emission factor** is **906.18 tCO_2e/GWh** or 0.90618 tCO_2e/MWh.

The details on calculations of baseline emission factor (OM, BM and CM) as provided by the CEA are shown in Annex 3.

Details of Baseline data:
Data of Operating and Build Margin for the three financial years from 2005-06 to 2007-08 has been obtained from - **The CO2 Baseline Database for the Indian Power Sector,** Ministry of Power: Central Electricity Authority (CEA), Version 4, dated: 25th September 2008. The detailed excel sheet is available at:
http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm

Estimation of Project Emissions
The project activity involves harnessing of wind energy and its conversion to electricity. Hence according to ACM0002 version 7, there will be no project emissions in the project activity ($PE_y = 0$).

Estimation of Leakage Emissions
As per ACM0002 version 7, no leakage has been considered for the calculation of emission factor (LEy = 0).

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

Data / Parameter:	**$EF_{OM,y}$**	
Data unit:	tCO_2/MWh	
Description:	Operating Margin Emission Factor of NEWNE Regional Electricity Grid	
Source of data used:	The CO_2 Baseline Database for the Indian Power Sector - Ministry of Power: Central Electricity Authority (CEA) Version 4. Also refer Annex 3	
Value applied:	**2005-06**	1.02
	2006-07	1.01
	2007-08	1.00
Justification of the choice of data or description of measurement methods and procedures actually applied :	Operating Margin Emission Factor has been calculated by the Central Electricity Authority using the simple OM approach in accordance with "Tool to calculate the emission factor for an electricity system"	
Any Comment:	Detailed information available at www.cea.in	

Data / Parameter:	**$EF_{BM,y}$**
Data unit:	tCO_2/MWh
Description:	Build Margin Emission Factor of NEWNE Regional Electricity Grid
Source of data used:	The CO_2 Baseline Database for the Indian Power Sector - Ministry of Power: Central Electricity Authority (CEA) Version 4. Also refer Annex 3
Value applied:	0.60 for the year 2007-08

Justification of the choice of data or description of measurement methods and procedures actually applied :	The Build Margin Emission Factor has been calculated by the Central Electricity Authority using the simple OM approach in accordance with "Tool to calculate the emission factor for an electricity system"
Any Comment:	Detailed information available at www.cea.in

Data / Parameter:	**EF_y**
Data unit:	tCO_2/GWh
Description:	Emission Factor for the NEWNE grid of India
Source of data used:	As per ACM0002, version 7, EFy is calculated as the weighted average of OM emission factor (weight given is 0.75) and BM emission factor (weight given is 0.25)
Value applied:	906.18
Justification of the choice of data or description of measurement methods and procedures actually applied :	The calculation has been done as per ACM0002, which is an approved methodology
Any Comment:	--

B.6.3. Ex-ante calculation of emission reductions:

The project activity reduces carbon dioxide through displacement of grid electricity generation with fossil fuel based power plants by renewable-wind electricity. The emission reduction ER_y due to project activity during a given year y is calculated as the difference between baseline emissions (BE_y), project emissions (PE_y) and emissions due to leakage (LE_y) as per the formula given below:

$$\mathbf{ER_y = BE_y - PE_y - LE_y}$$

Ex-ante calculation of emission reductions is equal to ex-ante calculation of baseline emissions as project emissions and leakage are nil.

Baseline emission factor (combined margin)
= 906.18 tCO_2e/GWh

Annual electricity supplied to the grid (GWh) has been calculated as below (presented in the table below):
= Capacity (MW) x PLF (%) x 8760 (hours) / 1000 (MW/GW)

Annual baseline emissions (tCO_2e) has been calculated as:
= 906.18 tCO_2e/GWh x Electricity supplied to the grid (GWh)
= 906.18 x 21.05 x 8760 x 20% / 1000
= 33419.6 t CO_2

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

Year	Estimation of project emissions (tCO_{2e})	Estimation of baseline emission reductions (tCO_{2e})	Estimation of leakage (tCO_{2e})	Estimation of total emission reduction (tCO_{2e})
01/05/2009 – 30/04/2010	0	33,420	0	33,420
01/05/2010 – 30/04/2011	0	33,420	0	33,420
01/05/2011 – 30/04/2012	0	33,420	0	33,420
01/05/2012 – 30/04/2013	0	33,420	0	33,420
01/05/2013 – 30/04/2014	0	33,420	0	33,420
01/05/2014 – 30/04/2015	0	33,420	0	33,420
01/05/2015 – 30/04/2016	0	33,420	0	33,420
01/05/2016 – 30/04/2017	0	33,420	0	33,420
01/05/2017 – 30/04/2018	0	33,420	0	33,420
01/05/2018 – 30/04/2019	0	33,420	0	33,420
Total	**0**	**3,34,196**	**0**	**3,34,196**

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

B.7.1 Data and parameters monitored:

Data / Parameter:	**EG_y**
Data unit:	kWh (will be converted to MWh by dividing with 1000)
Description:	Annual electricity supplied to the grid
Source of data to be used:	Actual measurement records (from energy meter reading at substation). The names of the substations for various WEGs have been provided in **Annex-4**
Value of data applied for the purpose of calculating expected emission reductions in section B.5	As given in table in section B.6.3
Description of measurement methods and procedures to be applied:	Net electricity supplied to grid will be measured through meter readings of the two-way export meter installed by MSEDCL. The procedures for metering and meter reading will be as per the provisions of the power purchase agreement
QA/QC procedures to be applied:	QA/QC procedures will be as implemented by MSEDCL pursuant to the provisions of power purchase agreement.
Any comment:	-

B.7.2. Description of the monitoring plan:

Approved monitoring methodology ACM0002, Version 7, Sectoral Scope 1, "Consolidated monitoring methodology for zero-emissions grid-connected electricity generation from renewable resources" is proposed to be used to monitor the emissions reductions.

This approved monitoring methodology calls upon monitoring of the following parameters:

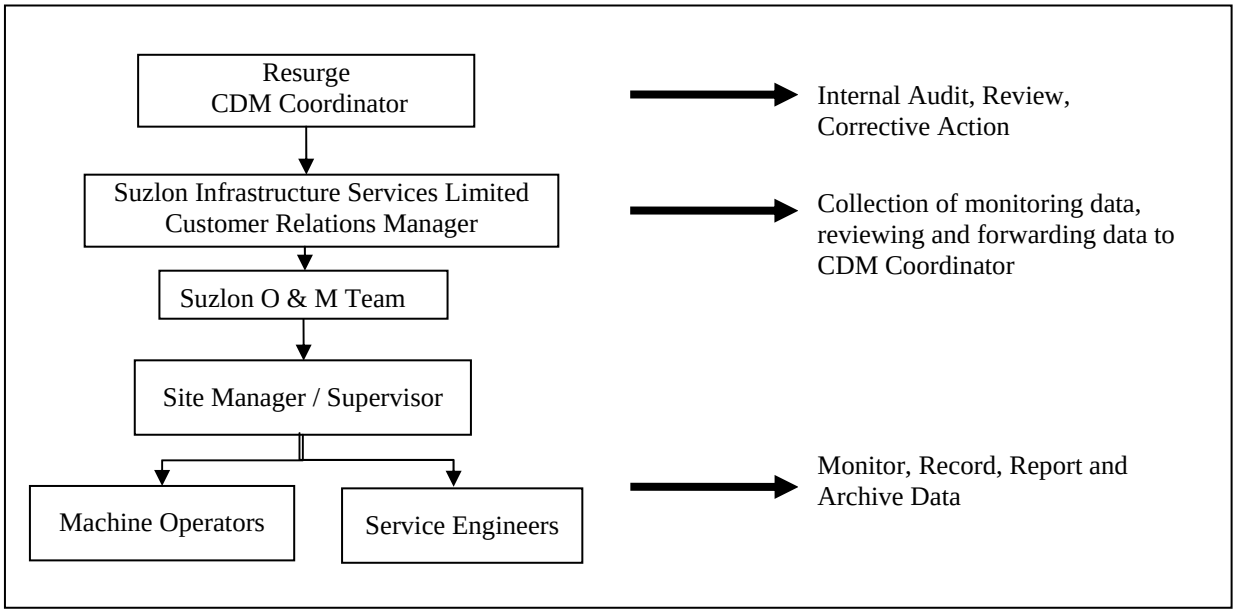
- Electricity generated from the project activity

- OM and BM emission factors of the grid, where *ex-post* determination of grid emission factor has been chosen.

Further, wind based electricity generation is not associated with any kind of leakages. Hence, the sole parameter for monitoring is the electricity supplied to the grid. The project is operated and managed by Suzlon Infrastructure Services Limited (Suzlon). Being an ISO certified organization, they follow the documentation practices to ensure the reliability and availability of the data for all the activities as required from the identification of the site, wind resource assessment, logistics, finance, construction, commissioning and operation of the wind power project.

The accuracy of monitoring parameter is ensured by adhering to the calibration and testing procedure as set in the power purchase agreement. The project will adhere to all the mandatory regulatory and statutory requirements at the state as well as national level.

The operational and management structure implemented by Resurge and Suzlon is as follows:



The authority and responsibility of project registration and overall project coordination would be with the CDM coordinator, Resurge.

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

Date of completion of baseline study and monitoring methodology: 25 August 2008.

Name of responsible person/entity: Resurge Energy Private Limited (project participant) and their advisors.

Contact Details of Resurge have been given in Annex 1.

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:

The start date of the project activity is 23 / 11 / 2005, being the date of placement of the first purchase order in the bundled project activity.

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

The project activity is expected to be operational for a period of 20 years 0 months.

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

C.2.1. Renewable crediting period:

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:

01/05/2009 or date of registration of project activity with UNFCCC.

C.2.2.2. Length:

10 years 0 months

SECTION D. Environmental impacts

D.1. Documentation on the analysis of the environmental impacts, including transboundary impacts:

As per the Schedule 1 of the EIA notification dated 14th September 2006[6], given by the Ministry of Environment and Forests (Government of India) under the Environment (Protection) Act 1986, EIA is not a regulatory requirement in India for wind energy projects.

Thus the project activity doesn't fall under the list of activities requiring EIA. The project activity will not involve any negative environmental impacts, as the WEGs are installed for generation of power using wind which is a clean source of energy.

D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

No negative environmental impacts have been envisaged with implementation of the project activity.

SECTION E. Stakeholders' comments

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

The stakeholder meeting for the project has been carried out at 3 locations essentially covering the complete set of installations in the candidate CDM project. The procedure adopted for obtaining the comments is as follows:

1. Submission of meeting notification to respective village representative, Sarpanch, through the on site supervisory team of Resurge.

2. Discussions for finalization of the date of meeting based on mutual availability of village governing council members, villagers and the representative of the project proponent.

3. On the day of meeting
- Presentation by the representative of Resurge about the technology and project in general;
- Handing over the questionnaire to the villagers and governing council members;
- Explanations of questions and collection of responses;
- Discussion of any other issues raised by the general public present at site; and
- Recording minutes of meeting.

E.2. Summary of the comments received:

The installations of WEGs in this area are being carried out since the year 2003-04 and it has been observed that the villagers were aware about the complete process of WEG installations and allied activities. Few of the villagers were also aware about the CDM procedures and the possibility of additional revenue stream to the project proponent. Minutes of the meeting carried out in all three districts will be provided during validation.

There were no specific comments made by the villagers except the following:

[6] http://envfor.nic.in/legis/eia/eia-2006.htm

- The right of way for usage of land around the site should remain as it is and people / villagers will continue to use it for general purpose and cattle grazing during monsoon season.
- Villagers expect more number of jobs / preferential job opportunities for them
- Villagers have sought confirmation that the project will not disturb the rainfall pattern in the area.

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

It was confirmed by the supervisory team from Resurge as well as the individual investors that:

- The villagers will continue to use the area around wind installations for their general purposes.
- The project proponent will provide preferential opportunities to local community based on their skills and ability.
- The wind installations do not disturb the rainfall / clouds. The project proponent agreed to provide scientific data to the village governing council.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Resurge Energy Private Limited
Street/P.O.Box:	2, Shantivan - 1/A,
Building:	Raheja Township, Malad (East)
City:	Mumbai
State/Region:	Maharashtra
Postcode/ZIP:	400 097
Country:	India
Telephone:	+91-22-2879 3686
FAX:	+91-22-2879 8636
E-Mail:	info@resurgegroup.com; gparish@resurgegroup.com
URL:	www.resurgegroup.com
Represented by:	Jayesh H. Savalia
Title:	Director
Salutation:	Mr.
Last name:	Savalia
Middle name:	H.
First name:	Jayesh
Department:	
Mobile:	+91-9833533141
Direct FAX:	
Direct tel:	
Personal e-mail:	jsavalia@resurgegroup.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding has been used in this CDM project activity.

Annex 3

BASELINE INFORMATION

The Operating Margin data for the most recent three years and the Build Margin data for the NEWNE Electricity Grid as published in the CEA database are as follows:

Simple Operating Margin

	tCO2e/MWh
Simple Operating Margin - 2005-06	1.02
Simple Operating Margin - 2006-07	1.01
Simple Operating Margin - 2007-08	1.00
Average Operating Margin of last three years	1.01

Build Margin

	tCO2e/MWh
Build Margin for the year 2007-08	0.60

Combined Margin calculations

	Weights	tCO2e/MWh
Operating Margin	0.75	1.01
Build Margin	0.25	0.60
Combined Margin		**0.90618**

Detailed information on calculation of Operating Margin Emission Factor and Build Margin Emission Factor is available at www.cea.nic.in.

Annex 4

MONITORING INFORMATION

The general conditions set out for metering, recording, meter readings, meter inspections, test & checking and communication are as per the PPA (power purchase agreement) with MSEDCL.

Metering: The delivered energy is metered by MSEDCL and Suzlon at the Low voltage side of the step up transformer installed at the sub-station.

Metering Equipment: Metering equipment is electronic meter of accuracy class 0.5% required for the Project. The metering equipment is maintained in accordance with electricity standards. The meter has the capability of recording hourly and monthly readings.

Meter Readings: The monthly meter reading will be taken jointly by the MSEDCL and Suzlon on the first day of every month for the preceding month. At the conclusion of each meter reading an appointed representative of the MSEDCL and Suzlon sign a document indicating the number of kWh indicated by the meter. The net energy sent out by each project owner shall be taken from the credit note published by MSEDCL. The credit note details the energy supplied to grid, energy intake from the grid and the net energy supplied to the grid for each project owner.

Inspection of Energy Meters: The main meters (export and import) and all associated instruments such as CT/PT installed at the project site shall be of 0.5% accuracy class. Each meter is jointly inspected and sealed on behalf of MSEDCL and Suzlon.

Meter Test Checking : The meter is tested for accuracy annually with reference to a portable standard meter. The portable standard meter is owned by the MSEDCL at its own cost and tested and certified from an accepted laboratory standard meter in accordance with electricity standards. The meters are deemed to be working satisfactorily if the errors are within specifications i.e. $\pm$ 0.5 %. The consumption registered by the meter will hold good for the purpose of billing as long as the error in the main meter is within the permissible limits.

If during the tests, the meter is found to be beyond the permissible limits of error, the meter shall be immediately calibrated and the correction applied to the reading registered by the meter to arrive at the correct reading of energy supplied for billing purposes for the period from the last month's meter reading up to the current test. Billing for the period thereafter till the next monthly reading shall be as per the calibrated meter.

The detailed location of substations and feeders to which all the WEGs under this project activity are connected to is given on the next page.

Feeder and Substation Details

S. No.	WEG Identification No.	Owner	Size (MW)	Feeder	Substation
1	K387	Aditya Air Products Ltd	1.25	Jamde 15	220 kV Jamde
2	J66	BDK Engineering Industries Pvt. Ltd. (earlier BDK Process Control Pvt .Ltd.)	1.25	Jamde 14	220 kV Jamde
3	J69	Echjay Forging Pvt. Ltd	1.25	Jamde 14	220 kV Jamde
4	G43	Gwalior Chemical Industries Limited	1.25	Ghatnandre Feeder 6	220 kV Ghatnandre
5	N275	Hind Aluminium Ind. Pvt.Ltd. (earlier Hind Aluminium)	1.5	Vita Feeder	220 kV Vita
6	N50	Jivraj Tea Ltd.	1.5	Ghatnandre Feeder 3	220 kV Ghatnandre
7	N282	Roha Dychem Pvt. Ltd.	1.5	Vita Feeder	220 kV Vita
8	N276		1.5		
9	N277		1.5		
10	N278		1.5		
11	N279		1.5		
12	W59	Sagar Agencies Pvt Ltd	0.6	Ghatnandre Feeder 4	220 kV Ghatnandre
13	GP38	Vishal Nirmiti Pvt. Ltd. (earlier - Permanent Prestress Pvt. Ltd.)	0.6	Shirsi Feeder	33 kV Shirsi
14	GP39	Vishal Nirmiti Pvt. Ltd. (earlier - Prestress India Pvt. Ltd.)	0.6		
15	K238	Zawar Sales Pvt. Ltd (earlier Zawar Sales Ltd.)	1.25	Jamde 4	220 kV Jamde
16	K239		1.25		
17	K289		1.25	Valve 2	220 kV Valve

Annex – 5


District Map of MAHARASHTRA
N
MADHYA PRADESH
GUJARAT
NANDURBAR
DHULE
JALGAON
AMRAVATI
NAGPUR
GONDIA
BHANDARA
AKOLA
BULDHANA
WARDHA
NASHIK
WASHIM
CHANDRAPUR
YAVATMAL
AURANGABAD
JALNA
HINGOLI
GADCHIROLI
CHHATTISGARH
THANE
AHMADNAGAR
PARBHANI
MUMBAI (BOMBAY) State Headquarter
BID
NANDED
RAIGARH
PUNE
LATUR
OSMANABAD
SOLAPUR
SATARA
ARABIAN SEA
RATNAGIRI
SANGLI
ANDHRA PRADESH
KOLHAPUR
KARNATAKA
SINDHUDURG
GOA
Map not to Scale
Copyright © 2006 Compare Infobase Limited
State Capital
State Boundary
District Boundary