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

CONTENTS

Annexes

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:

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Title: 7.5 MW wind energy project by Taurian Iron and Steel in the State of Gujarat.
Version: 1.0
Date of completion of PDD: 07/01/2008

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

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Objective of the Project

The objective is development, design, engineering, procurement, finance, construction, operation and maintenance of Taurian wind power project of 7.5 MW in the Indian state of Gujarat to provide reliable, renewable power to the Gujarat state electricity grid which is part of the Western regional electricity grid. The Project will lead to reduced greenhouse gas emissions because it displaces electricity from fossil fuel based electricity generation plants.

Nature of Project

The Project harnesses renewable resources in the region, and thereby displacing non-renewable natural resources thereby ultimately leading to sustainable economic and environmental development. Suzlon Energy Ltd will be the equipment supplier and the operations and maintenance contractor for the Project. The generated electricity will be supplied to Gujarat Urja Vikas Nigam Limited ("GUVNL") under a long-term power purchase agreement (PPA) for 20 years. The Project is owned by Trurian Iron and Steel and Suzlon Energy Limited is having the responsibility of operation and maintenance of the Wind farm. The details of the sub-projects comprising the Project are as under:

S.No.	Capacity (MW)	Date of Commissioning	Unique Identification Number
1	1.5	30-Mar-07	M-173
2	1.5	31-Mar-07	M-176
3	1.5	12-Apr-07	M-174
4	1.5	25-May-07	M-175
5	1.5	30-May-07	M-177

Contribution to sustainable development

The Project meets several sustainable development objectives including:

- contribution towards the policy objectives of Government of India and Government of Gujarat of incremental capacity from renewable sources;
- contribution towards meeting the electricity deficit in Gujarat;
- CO_2 abatement and reduction of greenhouse gas emissions through development of renewable technology;

- reducing the average emission intensity (SO_x, NO_x, PM, etc.), average effluent intensity and average solid waste intensity of power generation in the system;
- conserving natural resources including land, forests, minerals, water and ecosystems; and
- developing the local economy and create jobs and employment, particularly in rural areas, which is a priority concern for the Government of India;

A.3. Project participants:

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Please list project participants and Party(ies) involved and provide contact information in Annex 1. Information shall be indicated using the following tabular format.		
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)
Government of India (Host)	Private: Taurian Iron & Steel Company Private Limited	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.		
Note: When the PDD is filled in support of a proposed new methodology at least the host Party(ies) and any known project participant (e.g. those proposing a new methodology) shall be identified.		

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

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

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A.4.1.1. Host Party(ies):

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The host party to the project activity is the Government of India.

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

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The Project is located in the State of Gujarat that forms part of the Western regional electricity grid of India.

A.4.1.3. City/Town/Community etc:

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The Project is located in Suthari, Taluk Abdasa of Kutch District of Gujarat state in India.

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

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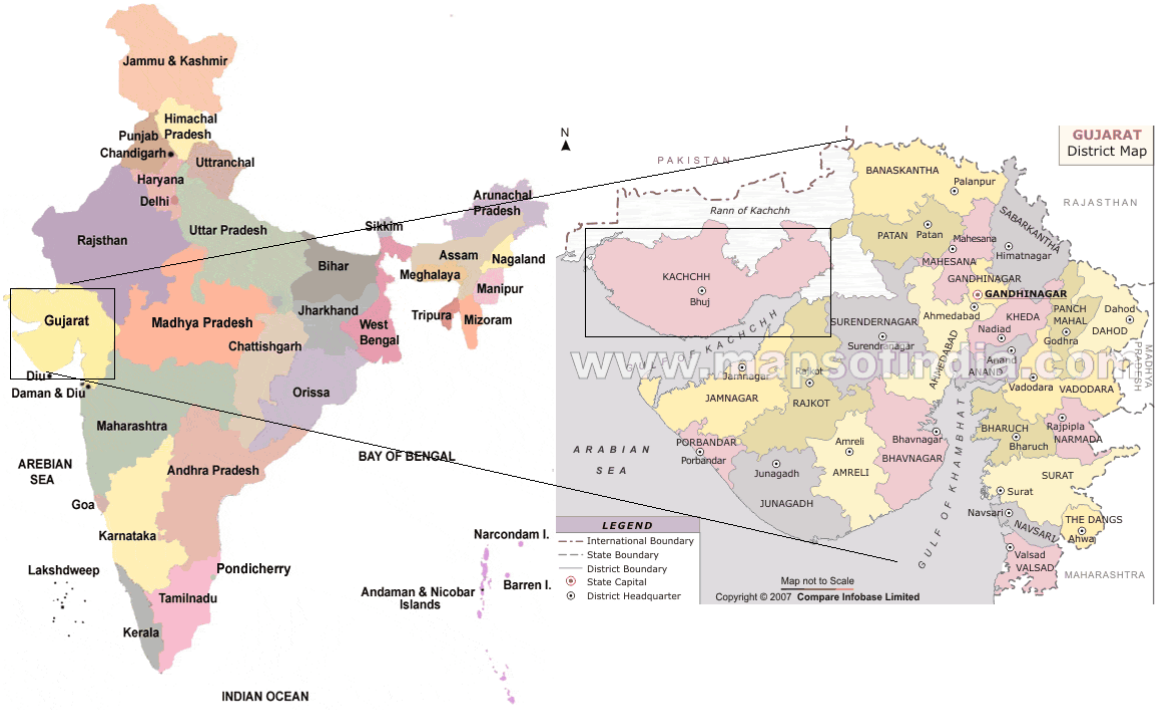
The Project is located in Suthari, Taluk Abdasa of Kutch District of Gujarat state in India. A location map is attached at Appendix – 1.

S.No.	Capacity	Date of Commissioning	Location Number	WTG Number
1	1.5	30-Mar-07	M-173	SEL/1500/06-07/0445
2	1.5	31-Mar-07	M-176	SEL/1500/06-07/0448
3	1.5	12-Apr-07	M-174	SEL/1500/06-07/0446
4	1.5	25-May-07	M-175	SEL/1500/06-07/0447
5	1.5	30-May-07	M-177	SEL/1500/06-07/0449
Total	**7.5**			



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

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Project Type and Category:

The type and category of the project activity as per Appendix B to the simplified modalities and procedures for small-scale CDM project activities is as under:

Project Type: I, Renewable energy project

Project Category: D, Electricity generation for system

The Project involves 5-wind energy converters (WECs) of Suzlon make (1500 kW S-82 with internal electrical lines connecting the Project with local evacuation facility. The WEGs generate 3-phase power at 690 V, which is stepped up to 33 KV. The Project operates at a frequency of 50.0 Hz and in the voltage range of 690 V to 731V. Other salient features of the technology are:

Technical Specification of Suzlon S 82

Wind Energy Generation Particulars	
Rotor Diameter	82 m
Hub height	78.5 m
Power Regulation	Independent electromechanical pitch system for each blade
Rated Voltage	3 Phase 690 V AC
Cut in wind speed	4 m/s
Cut out wind speed	20 m/s
Rated wind speed	14 m/s
Survival wind speed	52.5 m/s
Frequency variation	50 Hz – 2.5 Hz to + 2 Hz
Gear Box	
Type model make	Type: On planetry stage / Two helical stages Make: Winergy (Flender) / equivalent
Generation	1: 95.09
No. of steps	3 stages
Generator	
Type of Generator	Asynchronous type single speed induction generator with slip rings, variable rotor resistance
Rated Power output	1500 kW
Type	Single
Voltage	3 phase 690 V AC +/- 15%
No. of poles / RPM	4 / 1511 rpm(at rated power and short circuited rotor)
Tower	
Height	76 m
Type	Tubular tower made of welded steel plates
Yawing system	

Type	Slide dearing with gear ring and automatic greasing system along with active yaw drive having electric motor with brake, gearbox and pinion
Yaw Brake	Electromagnetic clutch brake provided with each active electric yaw drive
Brake System	
Aerodynamic	3 independent systems with blade pitching mechanism
Mechanical	Hydraulic disc brake, activated by hydraulic pressure + mechanical rotor lock, activated by hydraulic pressure
Rotor	
No of Blades	3
Rotor diameter	82 m
Swept Area	5281 m^2
Transformer Details	
Transformer Rating	1750 kVA, 50 Hz

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

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Years	**Annual estimation of emission reductions in tonnes of CO2e**
*Year 1	17,569
Year 2	17,569
Year 3	17,569
Year 4	17,569
Year 5	17,569
Year 6	17,569
Year 7	17,569
Year 8	17,569
Year 9	17,569
Year 10	17,569
Total estimated reductions (tonnes of CO2e)	**175,690**
Total number of crediting years	10
Annual average over the crediting period of estimated reductions (tonnes of CO2e)	17,569

*Year 1 commencing from the date of registration of the project with UNFCCC

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

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There is no ODA financing involved in the Project.

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

There are no other small-scale project activities belonging to project owners that have been registered within the last two years in the same project category and technology whose project boundary is within 1 km of the project boundary of this proposed small-scale project activity. Therefore in accordance with the annex-7, appendix-C of the simplified modalities and procedures for the small-scale CDM project activity, the project activity is not a debundled component of a large 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:

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The indicative baseline and monitoring methodology for selected small-scale CDM project activity categories AMS-I.D version 13 has been used. The title of the methodology is "Grid connected renewable electricity generation".

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

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The project activity utilizes wind power for electricity generation, which falls into the category of renewable energy. The installed capacity of the project is 7.50 MW, less than the threshold capacity of 15MW applicable for Type 1 small scale CDM project activities as per as per paragraph 6(c) of decision 17/CP.7., UNFCCC. Therefore the project activity can be regarded as a small-scale CDM project activity.

Electricity generated by the project is supplied to the grid which comprises of a large number of power generating units, this satisfies the necessary criteria i.e. "electricity generation for a system" for "category D" project activities as per Appendix B to the Simplified modalities and procedures for small-scale CDM project activities.

The project proponent hereby confirms that the capacity of the project activity will not exceed 15 MW during the crediting period.

In light of the above, the project is classified as type I.D. project activity.

B.3. Description of the project boundary:

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The project boundary, as stated in Appendix B of the simplified modalities and procedures for small-scale CDM project activities, encompasses the physical, geographical site of the renewable generation source. For calculation of baseline emission factor, AMS I.D. requires that procedures described in ACM0002 be followed. As per ACM0002, the spatial extent of the project boundary includes the project site and all power plants connected physically to the electricity system that the CDM project power plant is connected to.

The Indian electricity system is divided into five regional grids, viz. Northern, Eastern, Western, Southern, and North-Eastern. Each grid covers several states. As the regional grids are interconnected,

there is inter-state and inter-regional exchange. A small power exchange also takes place with neighbouring 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 Western regional electricity grid, the Western grid is the "project electricity system".

Accordingly, the project boundary encompasses the physical extent of the Western regional electricity grid which includes the project site and all power plants connected physically to the electricity system.

B.4. Description of baseline and its development:

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As per the Indicative Simplified Baseline and Monitoring Methodologies for selected small scale CDM Project activity categories (I.D Version 13 Scope 1), the baseline for wind energy generating systems is the electricity (measured in KWh) produced by the generating unit multiplied by an emission coefficient (measured in tCO2e/MWh) calculated in a transparent and conservative manner as either of the following.

(a) A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the approved methodology ACM0002. Any of the four procedures to calculate the operating margin can be chosen, but the restrictions to use the Simple OM and the Average OM calculations must be considered

OR

(b) The weighted average emissions (in tCO2e/MWh) of the current generation mix. The data of the year in which project generation occurs must be used.

We have used option (a) i.e. combined margin as per approved methodology ACM0002, as the emission co-efficient for calculating the baseline emissions.

Accordingly the baseline emissions are given as:

BEy = EGy * EFy ….……..(1)

Where:

- BEy Baseline emissions (tCO2e/year)
- EGy Electricity generation by the project activity (MWh/year)
- EFy Baseline emission coefficient determined in accordance with option (a) specified above

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:

Investment in wind energy projects in the state of Gujarat is not mandatory. There are no national or local laws or regulations that mandate this investment i.e. setting up of wind power projects, to be undertaken. Setting up of wind energy projects is a voluntary activity.

Investment Barrier

The post tax return on equity and equity IRR is used as the appropriate financial indicator because in the Indian power sector, a 14% post tax return on equity is an established benchmark for projects in public or private sector based on cost-plus regulations (Source: Central Electricity Regulatory Commission, Terms and Conditions of Tariff, Regulations 2004 dated 26 March 2004) for power projects. Incentives, foreign exchange variations and efficiency in operations are in addition to this benchmark of 14%.

For determining the tariffs for wind power projects, the electricity regulatory commissions of the state of Rajasthan and Gujarat have considered the return on equity at 14% while the electricity regulatory commissions of the state of Madhya Pradesh, Maharashtra and Karnataka have considered the return on equity at 16%[1].

There are some essential differences between the Project (whether implemented with or without CDM revenues) and utility scale fossil fuel and hydro projects. These should be taken into account while setting the appropriate level of equity IRR.

- The project activity tariff structure is a single-part tariff structure as compared to fossil fuel and hydro projects, which have two-part tariff structure. This implies that project activity carries a higher investment risk than fossil fuel and hydro projects where the investment recovery is decoupled from the level of actual generation achieved by the project due to variations in offtake.

  Thus, in case of the project activity, issues such as transmission unavailability, back-down of generation or part-load operations, which are beyond the control of the investors, are likely to affect the project activity more severely and therefore the project activity investors would require higher rate of return to compensate them for these additional risks.

- In case of fossil fuel and hydro projects, these are by reference to cost-plus approach whereby the projects recover their full investment cost each year if they are able to reach specified level of plant availability. In case of the Project, it does not recover its full investment cost in the initial years as the tariffs are back-loaded. This increases the investment risks in the project activity compared to conventional power generation activities like fossil fired and hydro power projects.

Based on the above considerations, 14% post-tax equity IRR is considered to be the appropriate post-tax equity return.

The financial analysis for calculating the benchmark (post-tax equity IRR) is carried out and Key assumptions used for calculating the benchmark (post-tax equity IRR) are set out below.

Owner:	Taurian Iron and Steel
Project:	7.5 MW
Location :	Gujarat

Assumptions for Financial Model

[1]Source: RERC Order dated 29 September 2006

Capacity of Machines in kW	1500
Number of Machines	5
Project Capacity in MW	7.50
Project Commissioning Date	1-May-07
Project Cost per MW (Rs. In Millions)	57.7

Operations	
Plant Load Factor - 1st to 5th year	29.68%
Plant Load Factor - 6th to 9th year	29.68%
Plant Load Factor - 10th to 13th year	29.68%
Plant Load Factor - 14th to 17th year	29.68%
Plant Load Factor - 18th to 20th year	29.68%
Insurance Charges @ % of capital cost	0.07%
Operation & Maintanance Cost base year @ % of capital cost	1.93%
% of escalation per annum on O & M Charges	5.0%

Tariff	
Base year Tariff Rs./Kwh	3.37
Annual Escalation (Rs./kWh per Year)	0.00
Tariff applicable (Rs/kWh)	3.37

Project Cost	Rs Million
Land and Infrastructure, Generator & Electrical Equipments, Mechanical Equipments, Civil Works, Instrumentation & Control, Other Project Cost, Pre operative Expenses, etc.	
Total Project Cost	433

Means of Finance for M173		Rs Million
Own Source	25%	21.60
Term Loan	75%	65.00
Total Source		86.60
Terms of Loan		
Interest Rate	13.50%	
Tenure	5	Years
Moratorium	3	Months

Means of Finance for M174		Rs Million

Own Source	25%	21.60
Term Loan	75%	65.00
Total Source		86.60
Terms of Loan		
Interest Rate	13.50%	
Tenure	5	Years
Moratorium	3	Months

Means of Finance for M175/M176/M177		Rs Million
Own Source	34%	87.50
Term Loan	66%	172.30
Total Source		259.80
Terms of Loan		
Interest Rate	7.50%	
Tenure	5	Years
Moratorium	3	Months

Income Tax Depreciation Rate (Written Down Value basis)	
on Wind Energy Generators	80%
On other Assets	10%
Book Depreciation Rate (Straight Line Method basis)	
On all assets	7.86%
Book Depreciation up to (% of asset value)	90%

Income Tax	
Income Tax rate	30%
Minimum Alternate Tax	10%
Surcharge	10%
Cess	2%

Working capital	
Receivables (no of days)	45
O & m expenses (no of days)	30
Working capital interest rate	12%

CER Revenues	
CER Price in US$	-

Exchange rate Rs./US$*	43.59

* RBI reference rate as of 15 November 2006

Crediting period starts	1-Apr-08
Length of Crediting period	10

Baseline Emission Factor for Northern Region (tCO2/GWh)	901.00

The equity IRR for the Project without CDM revenues is 9.7 %, which is less than the benchmark IRR.

Barriers due to Prevailing Practice

We analyze the extent to which wind energy projects have diffused in the electricity sector in Gujarat. In 2004 – 05, wind electricity generation was 350 GWh[2] and the total electricity availability from all the sources at bus-bar in the state of Gujarat was 53410 GWh[3]. This works out to 0.65%, showing that wind energy power generation is insignificant as compared to other power project generation sources in Gujarat.

Installed capacity of wind energy generation sources stood at 219.9 MW[4] as of 31 March 2005.

Clearly, wind power project development in Gujarat is insignificant when compared to the power sector of Gujarat. Further, wind power project development is substantially dependent on CDM mechanism and thus is not common practice.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

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According to the approved small scale methodology ASM I.D. version 12, the emission reductions ***ERy*** by the project activity during a given year "*y*[1]" is

ERy = BEy – PEy – Ly……..(1)

where *BEy* is the baseline emissions
PEy is project activity emissions and;

[2] Source: Table No. 3.4, CEA General Review 2006

[3] Source: Table No. 5.2, CEA General Review 2006

[4] Source: Table No. 2.4, CEA General Review 2006

[1] Throughout the document, the suffix *y* denotes that such parameter is a function of the year y, thus to be monitored at least annually.

Ly is the amount of emissions leakage resulting from the project activity.

Baseline Emissions for the amount of electricity supplied by project activity, *BEy* is calculated as

BEy = EGy * EFy ……..(2)

Where, *EGy* is the electricity supplied to the grid, *EFy* is the CO_2 emission factor of the grid as calculated below.

As per AMS I.D. the baseline emission coefficient for wind power projects could be either of the following:

(a) A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the approved methodology ACM0002. Any of the four procedures to calculate the operating margin can be chosen, but the restrictions to use the Simple OM and the Average OM calculations must be considered.

(b) The weighted average emissions (in kg CO2equ/kWh) of the current generation mix. The data of the year in which project generation occurs must be used.

We have used option (a) Combined Margin consisting of operating margin (OM) and build margin (BM) according to the procedures prescribed in the approved methodology ACM0002, as the applicable emission coefficient for determining baseline emissions.

As per approved baseline methodology ACM0002, the combined margin emission factor (denoted as "*EFy")* is represented as a combination of the Operating Margin (OM) and the Build Margin (BM) of the project electricity system i.e. the Western region electricity grid. Considering the emission factors for these two margins as $EF_{OM,y}$ and $EF_{BM,y}$, the *EFy* is given by:

$$EFy = w_{OM} * EF_{OM,y} + w_{BM} * EF_{BM,y} \quad \text{……...(3)}$$

with respective weight factors w_{OM} and w_{BM} (where $w_{OM} + w_{BM} = 1$).

Operating Margin Emission Factor Calculation

As per ACM0002, dispatch data analysis should be the first methodological choice. However, this option is not selected because the information required to calculate OM based on dispatch data is not available in the public domain for the Western region electricity grid.

The Simple Operating Margin approach is appropriate for calculating the Operating Margin emission factor applicable in this case. As per ACM0002 the Simple OM method can only be used where low cost must run resources constitute less than 50% of grid generation based on average of the five most recent years. The generation profile of the Western grid in the last five years is as follows:

Generation in GWh	**2004-05**	**2003-04**	**2002-03**	**2001-02**	**2000-01**
Low cost/must run sources					
Hydro	10,610	9,282	8,172	7,928	7,174
Wind & Renewables	884	1,522	879	610	314

Nuclear	5,100	5,700	6,200	6,073	5,903
Other sources					
Coal	141,964	136,063	137,392	133,628	128,561
Diesel	-	-	-	-	-
Gas	25,526	21,508	18,713	16,072	21,280
Total Generation	**184,084**	**174,075**	**171,356**	**164,311**	**163,232**
Low cost/must run sources	16,594	16,504	15,251	14,611	13,391
Low cost/must run sources	9%	9%	9%	9%	8%

Source: Table 3.4 of CEA General Review 2004-05, 2003-04, 2002-03, 2001-02, 2000-01

From the available information it is clear that low cost/must run sources account for less than 50% of the total generation in the Western grid in the last five years. Hence the Simple OM method is appropriate to calculate the Operating Margin Emission factor applicable.

Build Margin Emission Factor

The Build Margin emission factor *EF_BMy* (tCO_2/MWh) is given as the generation-weighted average emission factor of the selected representative set of recent power plants represented by the 5 most recent plants or the most recent 20% of the generating units built (summation is over such plants specified by k):

$$EF_{BM,y} = [\sum_i F_{i,m,y} * COEFi] / [\sum_k GEN_{k,m,y}] \quad \text{.....(4)}$$

The summation over *i* and *k* is for the fuels and electricity generation of the plants in sample *m* mentioned above.

The choice of method for the sample plant is the most recent 20% of the generating units built as this represents a significantly larger set of plants, for a large regional electricity grid have a large number of power plants connected to it, and is therefore appropriate.

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 Operating Margin and Build Margin Emission Factors of all the regional electricity grids in India. The Operating Margin in the CEA database is calculated ex ante using the Simple OM approach and the Build Margin is calculated ex ante based on 20% most recent capacity additions in the grid based on net generation as described in ACM0002. We have, therefore, used the Operating Margin and Build Margin data published in the CEA database, for calculating the Baseline Emission Factor.

Combined Margin Emission Factor

As already mentioned, baseline emission factor (EFy) is calculated as a combined margin (CM), calculated as the weighted average of the operating margin (OM) and build margin (BM) factor. In case of wind power projects default weights of 0.75 for EF_{OM} and 0.25 for EF_{BM} are applicable as per ACM0002. No alternate weights are proposed.

Using the values for operating margin and build margin emission factors for Western regional electricity grid provided in the CEA database and their respective weights for calculation of combined margin emission factor, the baseline carbon emission factor (CM) is 0.9015 tCO2e/MWh.

Project Emissions:

The project activity uses wind power to generate electricity and hence the emissions from the project activity are taken as nil.

PEy = 0

Leakage:

As per the applicable approved methodology AMS I.D., version 12, leakage is to be considered if the energy generating equipment is transferred from another activity. The project activity is a green field power wind power generation facility and the energy generating equipment used in the project activity has not been transferred from any other activity. Hence, leakage is not considered.

Ly = 0

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

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Data / Parameter:	$EF_{OM,y}$
Data unit:	tCO2e/MWh
Description:	Operating Margin Emission Factor of Western Regional Electricity Grid
Source of data used:	"CO2 Baseline Database for Indian Power Sector" published by the Central Electricity Authority, Ministry of Power, Government of India. The "CO2 Baseline Database for Indian Power Sector" is available at www.cea.nic.in
Value applied:	2004 – 05: 0.9801 2005 – 06: 0.9992 2006 – 07: 0.9985
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 ACM0002.

Data / Parameter:	$EF_{BM,y}$
Data unit:	tCO2e/MWh
Description:	Build Margin Emission Factor of Western Regional Electricity Grid
Source of data used:	"CO2 Baseline Database for Indian Power Sector" published by the Central Electricity Authority, Ministry of Power, Government of India. The "CO2 Baseline Database for Indian Power Sector" is available at www.cea.nic.in

Value applied:	0.6283
Justification of the choice of data or description of measurement methods and procedures actually applied :	Build Margin Emission Factor has been calculated by the Central Electricity Authority in accordance with ACM0002.

B.6.3 Ex-ante calculation of emission reductions:

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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)
= 0.9015 tCO2e/MWh

Annual electricity supplied to the grid by the Project
= 7.50 MW (Capacity) x 29.68% (PLF) x 8760 (hours) / 1000 GWh
= 19.5 GWh

Annual baseline emissions
= 0.9010 tCO2e/MWh x 19.5 GWh
= 17,769 tCO2e

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

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Years	Estimation of project activity emissions (tCO2e)	Estimation of baseline Emissions (tCO2e)	Estimation of Leakage (tCO2e)	Estimation of overall emission reductions (tCO2e)
*Year 1	0	17,569	0	17,569
Year 2	0	17,569	0	17,569
Year 3	0	17,569	0	17,569
Year 4	0	17,569	0	17,569
Year 5	0	17,569	0	17,569
Year 6	0	17,569	0	17,569
Year 7	0	17,569	0	17,569
Year 8	0	17,569	0	17,569
Year 9	0	17,569	0	17,569
Year 10	0	17,569	0	17,569
Total (tonnes of CO2e)	**0**	**175,690**	**0**	**175,690**

*Year 1 commencing from the date of registration of the project with UNFCCC

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

B.7.1 Data and parameters monitored:

Data / Parameter:	**EGy**
Data unit:	MWh (Mega-watt hour)
Description:	Net electricity supplied to the grid by the Projects

Source of data to be used:	Certification of metering records/tariff invoices raised on GUVNL.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Annual electricity supplied to the grid by the Project based on the Joint Meter Reading taken in the presence of personal of GETCO, Gujarat Urja Vikas Nigam Limited and Suzlon.
Description of measurement methods and procedures to be applied:	Net electricity supplied to grid is measured by main meters (export and import) at the Metering Point. This is further described in Annexure – 4.
QA/QC procedures to be applied:	QA/QC procedures are elaborated in Annexure – 4 (Monitoring Plan).
Any comment:	The meter testing and checking procedures that are solely within the purview of GUVNL and GETCO, i.e., frequency of testing of main/check meters, quality and standards of portable meter testing equipment, testing and calibration of portable meter testing equipment using a meter testing bench, testing and calibration of meter testing bench, etc. are outside the purview of the monitoring plan for the Projects.

B.7.2 Description of the monitoring plan:

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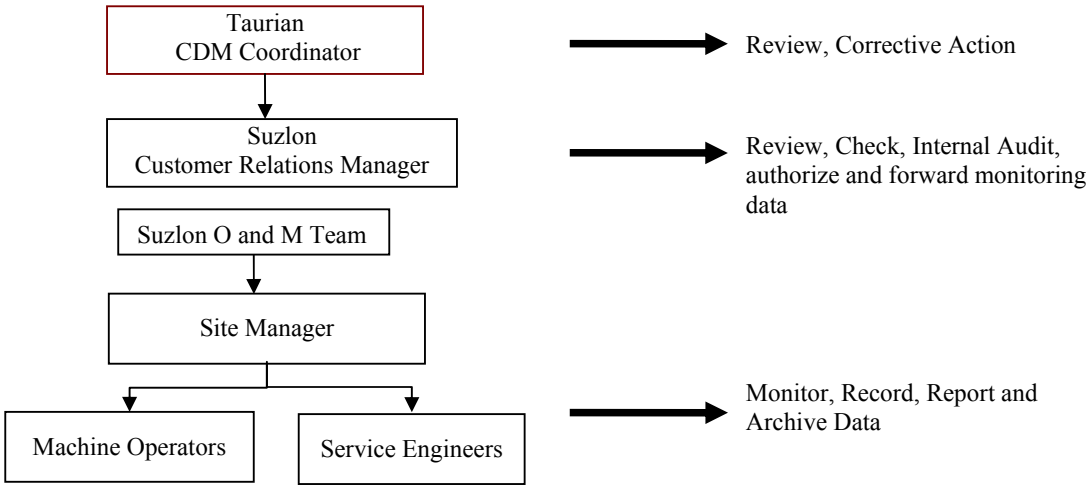
The project activity falls in the technology measure as described in the paragraph 1 of the Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories. The applicable simplified baseline and monitoring methodology for selected small scale CDM project activities AMS I.D. version 13 requires monitoring of the following.

- Metering the electricity generated by the renewable technology
- In the case of co-fired plants, the amount of biomass and fossil fuel input consumed.

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 Energy Limited. Suzlon Energy Limited is 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 Taurian and Suzlon is as follows:



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: 02/01/2008

Name of responsible person/entity: Taurian Iron and Steel Company Private Limited and PricewaterhouseCoopers India Pvt. Limited (CDM advisors of Taurian Iron and Steel)

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:

>>

19/02/2007, being date of placement of Purchase Order for the first installation.

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

>>

20 years

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

The project activity will use fixed crediting period.

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:

>>

01/09/2008 or the date of registration of the project activity which ever is later.

C.2.2.2. Length:

>>

10 years and 0 months

SECTION D. Environmental impacts

>>

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

>>

As per the Schedule 1 of Ministry of Environment and Forests (Government of India) notification dated January 27, 1994 and EIA Notification (S.O 1533) dated 14th September 2006, a list of activities that require to undertake environmental impact assessment studies has been provided. EIA is not a regulatory requirement in India for wind energy projects and HPCL does not expect any adverse impacts of the proposed CDM project activity on the environment.

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:

>>

The environmental impacts from the proposed CDM project activity are not considered significant.

There are no trans-boundary impacts of the proposed CDM project activity.

SECTION E. Stakeholders' comments

>>

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

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The comments from local stakeholders were invited through a local stakeholder meeting conducted at Suthari Village, Abdasa, Bhuj, Gujarat on 19 Feb-2008. A letter for the meeting to be conducted was provided to the gram sarpanch on 11-Feb-2008 inviting the local stakeholders for the meeting.

The local stakeholder consultation meeting had representatives from the nearby villages and representatives of Suzlon. The minutes of the meeting are set out in Appendix 2.

The players included in the stakeholders for the proposed project are as follows:

1. Local Villagers
2. Official of Suzlon

The owners of the land area where the wind farm is located were contacted and transfer of land was transacted under the proper legal system.

The stakeholders of each village of the project were contacted before the starting of the project and were briefed about the activity, its associated positive impacts to the environment and the direct benefits to their livelihood. Discussions were held on the many aspects of the lives of the villagers that may have been negatively or positively impacted by the project. They were interviewed and encouraged to provide comments and suggestions regarding the activity.

E.2. Summary of the comments received:

>>

The meeting was held in Suthari on 19-Feb-2008. Villagers indicated that the project activity have led to development of the local villagers and have provided the local persons with the employment opportunities.

The project proponent has secured statutory clearance to the project for its establishment and operation. This is a reflection of the environmentally benign activity that adheres to the prescribed standards of compliance. The minutes of meeting is provided in Annexuer-2.

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

>>

No negative comments received from the local stakeholders.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Taurian Iron & Steel Co. Pvt. Ltd.
Street/P.O.Box:	302 A
Building:	Poonam Chambers , Dr. Annie Besant Road, Worli
City:	Mumbai
State/Region:	Maharashtra
Postfix/ZIP:	400018
Country:	India
Telephone:	+91 22 66698000
FAX:	+91 22 66698010 / 66698020
E-Mail:	taurian@vsnl.com
URL:	www.taurisnsteel.com
Represented by:	
Title:	
Salutation:	
Last Name:	Bhadresa
Middle Name:	Sharad
First Name:	Sandeep
Department:	Finance
Mobile:	+91 9322331877
Direct FAX:	
Direct tel:	
Personal E-Mail:	Sandeep.bhadesha@tauriansteel.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

There is no ODA financing involved in the project activity.

Annex 3

BASELINE INFORMATION

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

Simple Operating Margin

	tCO2e/MWh
Simple Operating Margin - 2004-05	0.9801
Simple Operating Margin - 2005-06	0.9992
Simple Operating Margin - 2006-07	0.9985
Average Operating Margin of last three years	0.9926

Build Margin

	tCO2e/MWh
Build Margin	0.6283

Combined Margin calculations

	Weights	**tCO2e/MWh**
Operating Margin	0.75	0.7444
Build Margin	0.25	0.1570
Combined Margin		**0.9010**

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 electricity supplied to the grid will be metered at the 33/66/220 kV level at the GETCO substation at Suthari, Abdasa. Representatives of GETCO/GUVNL and power producer will jointly take the main reading and sign the meter reading on the first day of every month. Simultaneously, the joint meter reading at the Check metering will also be taken by representatives of GETCO/GUVNL and power producer.

- The meters will jointly inspected/tested once in a year as per the terms of the PPA. Joint inspection and testing will also be carried out as and when difference in monthly meter readings exceeds the sum of maximum error as per accuracy class of main and Check meters.

- In case the meters are found to operate outside the permissible limits, the meters will be either replaced immediately or calibrated. Error correction will be applied to the meter reading. Whenever a main meter goes defective, the consumption recorded by the Check meter will be referred. The details of the malfunctioning along with date and time and snaps shot parameters along with load survey will be retrieved from the main meter. The exact nature of the malfunctioning will be determined after analysing the data so retrieved and the consumption recorded by the main meter will be assessed accordingly.

- In case both main and the check meters are found beyond the permissible limit of error both the meters shall be calibrated immediately and correction applicable to the main meter shall be applied to the energy registered by the main meter at the correct energy for the purpose of energy account/ billing for the actual period during which inaccurate measurements were made, if such period can be determined or, if not readily determinable, shall be the shorter of:

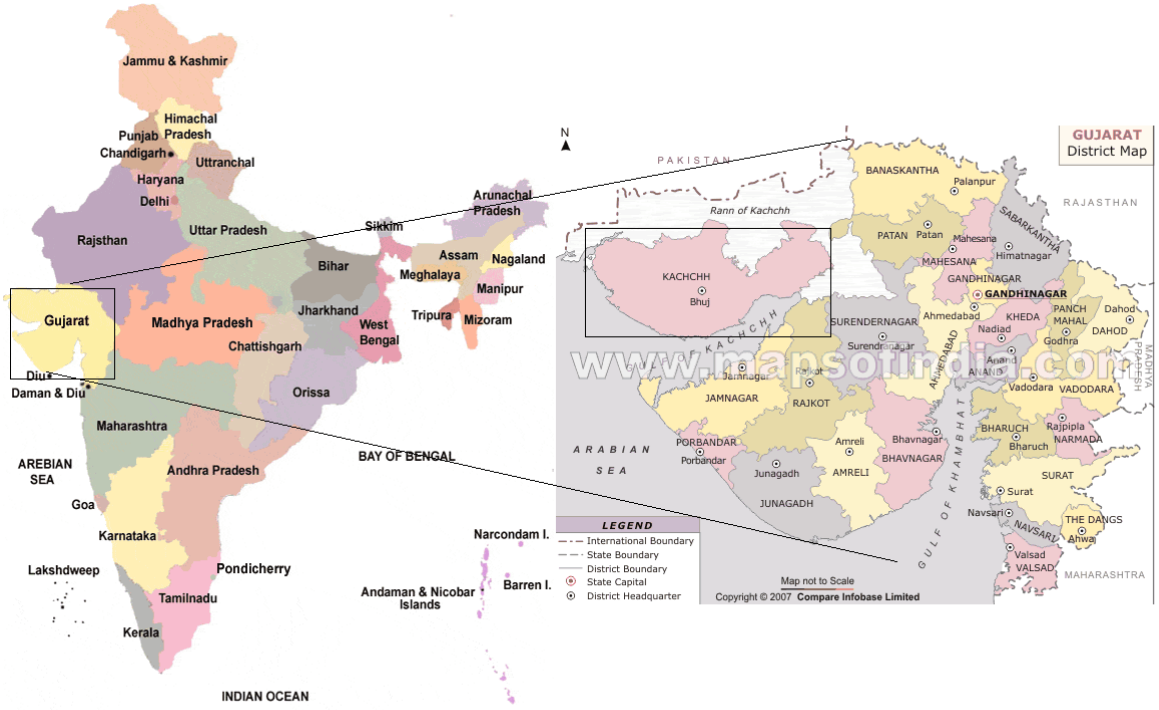
    - The period since the immediately preceding test of the relevant main meter, or

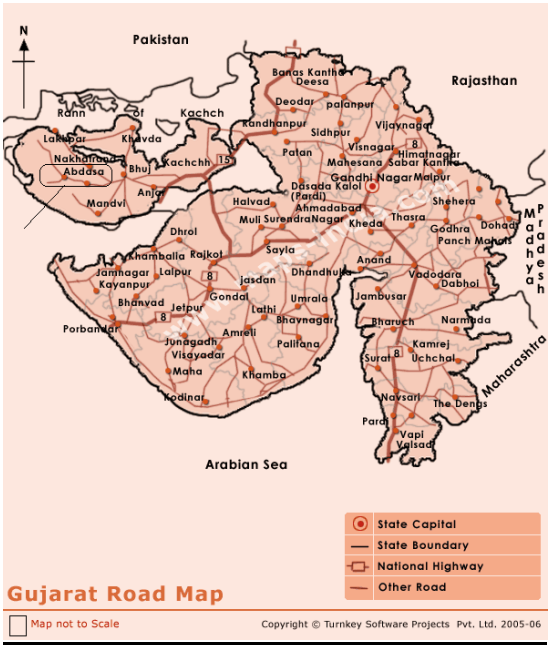
    - One hundred and eighty days immediately preceding the test at which the relavant main meter was determined to be defective or inaccurate

- The main and the Check metering systems will be sealed in presence of representatives of Power producer and GETCO/GUVNL.

- Both main and Check meters are of accuracy class of 0.2 and are inspected once every year for its accuracy by GETCO/GUVNL.

Appendix 1 – Location Map





Appendix-2
Minutes of Stakeholder Consultation meeting

Minutes of Clean Development Mechanism meeting held at Village : Suthari , Tal : Abdasa, , Bhuj, Gujarat on 19.02.2008.

MEETING PRESIDED BY:

1. Mr. Jusab Jafar , Mr. Damji Bhimji Jafar, Mr. Sodha Juber, Mr. Jafer Bhutha and others – Representative Of Village Suthari
2. Mr. Dwijal Mamtora , Mr. Jignesh, - Representative of Suzlon
3. Mr.Sandeep Bhadresa , Mr.Nimesh Shroff, Mr. K L Rathi, Mr. B J Rajpara, Mr. V.K. Duggal.

AGENDA OF THE MEETING IS FIXED AS FOLLOWS:

1. Welcome speech by the organizers.
2. Introduction to 'Clean Development Mechanism' by the Organizers.
3. Description of the project
4. Speech of Invitees.
5. Interactive session with the stake holders.
6. Vote of thanks.

Welcome Speech:

Mr. Dwijal Mamtora, CRM of Suzlon Energy Limited
Mr. Dwijal Mamtora started with Brief Introduction of Villagers, Suzlon Representative and Investors. Mr. Dwijal welcomed all the stakeholders and explined that Meeting is conveyed for discussing Opinions and Concerns and benefits received from the Wind Power project established in this region by Taurian Iron and Steel Company.

Introduction to 'Clean Development Mechanism' by the Organizers

Mr. Dwijal Mamtora , CRM, Suzlon Energy Ltd, explained about the CDM to all the stakeholders and in his speech he explained how carbon levels in the atmosphere is increasing and to reduce the Green House gas Emission various Non Polluting acts are to be initiated. He further explained how Windfarm Projects generates pollution free Energy and helps in creating employment opportunities to the villagers.

Speech of Invitees

Mr. Sandeep Bhadresa, Representative of Taurian Iron & Steel Co. Pvt. Ltd. begun his speech with brief background of the company and explained that Taurian is committed to protect the Environment and to be part of the process, company has developed the Wind farm which generates Pollution free power and it adds to National resources and above all it generates employment to the Local Villager and helps in increasing the standard of living of the society. Wind farm Projects apart from providing employment opportunities is also providing the Education, Medical and Infrastructure facilities to the Society.

Mr. Nimesh Shroff Representative of Avichal Weaves P Ltd. in his speech explained how Wind Power Plants generates the Green Energy and meets the demand of electricity of the region and which helps in the development of the nation and Society.

Mr. B J Rajpara Ex. J.T.O.GEDA and a Consultant for Energy related Services explained about the Wind Power Plants and its importance. He also said that Wind farms helps in Economic Well being of the Society through Various Job Opportunities i.e. Civil Construction, Drivers, Security Personnel, Technicians, Casual Labours etc.

Mr. K L Rathi, Representative K L Rathi Steels Ltd. in his speech explained that Wind farms have been developed on the Land which is Uncultivable Lands and the same is purchased by Government of Gujarat and being leased to the Wind farm Developers or Investors and hence has not resulted in to any manipulation by any of the party. Wind Power Projects also helps in catering the power shortages faced by the Nation.

Queries and responses from the proponent and the stakeholders

1. ***Can the Wind farm Project Lead to Variation in Rainfall?***
   Wind Power Project does not result in to any variation in the rain fall.

2. ***What are the benefits to the stakeholders?***
   Wind Power Projects helps in creating employment opportunities, reducing the shortage of electricity Supply and also helps in earning good amount by selling the Uncultivable Land.

3. ***Does the project affect the grazing of cattle?***
   It does not affect the cattle Grazing as, wind farms are located which is far away from Village.

4. ***Has the project affected the Ground water level?***
   No, wind project does not affect either Ground water Level or Drinking water quality of nearby area of the project.

5. ***Has Electricity Supply Improved, since Installation of the project?***
   Power supply has resulted in to well being of the villagers.

Vote of thanks

Mr. Dwijal Mamotra, CRM, Suzlon thanked all the stakeholders, Village Public Representatives, Government Officials, Gujarat Electricity Board Officials for sharing their opinions and Concerns.