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

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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:

>>
Suzlon 8.40 MW Wind Power Project
Version: 4.1
Date : 12/10/2012

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

>>
Kishangarh Hi-tech Textile Park Ltd. (KHTPL) has awarded a contract for 8.4 MW wind power project to world's third leading and India's largest wind turbines manufacturer, Suzlon Energy Limited (SEL).

Kishangarh Hi-tech Textile Park Ltd.(KHTPL) will sign-up an Energy Wheeling Agreement (EWA) with Rajasthan Rajya Vidyut Prasaran Nigam Limited and the power generated will be wheeled for utilization at KHTPL's state-of-the-art hi-tech integrated textile park being developed at Kishangarh (Dist. Ajmer) in Rajasthan.

Purpose of the project activity:

The project activity is promoted by Kishangarh Hi-tech Textile Park Ltd. The project activity involves supply, erection, commissioning and operation of 4 Wind Turbine Generators (WTGs) of 2100 kW each at District Jaisalmer in Rajasthan; all WTGs are supplied and manufactured by Suzlon Energy Limited. The main purpose of the project activity is to generate electrical energy through sustainable means using wind power resources, to utilize the generated output for selling it to the third party and to contribute to climate change mitigation efforts.

Therefore, NEWNE grid emissions are considered as the baseline for the power generated through the WTGs connected with NEWNE grid. The main emission source in the baseline scenario is the fossil fuels based power plants connected to the NEWNE grid and main greenhouse gas involved is CO_2.
The WTGs convert wind energy into electrical energy and do not use any other fuel for generating the electricity, therefore, the project emissions are taken as zero.

The owners of the WTGs are:-

Project Proponents' Name	Capacity in MW
Kishangarh Hi-tech Textile Park Ltd.	2.1 X 4

Pre-project Scenario:

The project participant was not involved in generation of wind based power and supplying the electricity to the grid under the pre-project scenario, therefore, in the absence of the project activity the equivalent amount of electricity would have been generated from the connected / new power plants in the NEWNE grid, which are / will be predominantly based on fossil fuels. The project proponent was using grid electricity for the operations of its textile park at Kishangarh under pre-project scenario; therefore, in the absence of the project activity the equivalent amount of electricity would have been used from the NEWNE grid.

The main emission source in the pre-project scenario is the fossil fuels based power plants connected to the NEWNE and Southern grid and main greenhouse gas involved is CO_2. The baseline of the project is same as the pre project scenario.

Post Project Scenario: Implementation of Project
The wind power generated from the project site will be displacing the electricity generated from thermal power stations feeding into regional grid and will be replacing the usage of diesel generators for meeting the power demand during shortage periods. Since wind power is Green House Gas (GHG) emissions free, the power generated will replace electricity generated by the fossil fuel based thermal power stations comprising coal, diesel, furnace oil and gas. Thus the proposed project activity results in emission reductions.
The post project scenario therefore:
- Provides additional generation from a clean source of energy
- Strengthens the regional grid (NEWNE)
- Increases availability of electricity to the NEWNE grid
- Reduces the anthropogenic GHG emissions

Contribution of project activity to sustainable development:

The project proponent believes that the project activity has contributed to the sustainable development as discussed below according to the indicators stipulated by Ministry of Environment and Forests, Govt. of India for sustainable development in its interim approval guidelines for host country approval eligibility criteria for Clean Development Mechanism (CDM) projects:[1]

I. Social well being:

- The project activity provided job opportunities to some of the local people during erection and operation of the wind farms contributing up to some extent in poverty alleviation of the local community. The company has developed both the sites and approach roads.
- The project activity will also contribute in infrastructure development by improving the availability of the electricity to the NEWNE grid, hence contributing towards meeting the electricity deficit in Rajasthan**.**

II. Economic well being:

- The project activity leads to investment to a developing region which otherwise would not have happened in the absence of project activity. The generated electricity is fed into the regional grid through local grid, thereby improving the grid frequency and availability of electricity to the local consumers (villagers & sub-urban habitants) which will provide new opportunities for industries and economic activities to be setup in the area thereby resulting in greater local employment, ultimately leading to overall development.
- The proposed CDM project activity requires temporary and permanent, skilled and semi-skilled manpower at the wind park; this will create additional employment opportunities.

III. Environmental well being:

- The project utilizes wind energy for generating electricity which otherwise would have been generated through the operation of power plants in the NEWNE grid mix, contributing to

[1] http://www.cdmindia.in/approval_process.php

reduction in specific emissions (tons of emissions /MWh of energy generated) including GHG emissions.

- As wind power projects produce no end products in the form of waste (eg. Particulate Matter, Fly ash, Water effluent etc.).
- Being a renewable resource, using wind energy to generate electricity contributes to natural scare resource (eg. Fossil fuel used for electricity generation) conservation.
- Thus, the project causes no negative impact on the surrounding environment contributing to environmental well being.

IV. Technological well being:

- The project activity leads to the promotion of 2.1 MW of SEL WTGs into the region, demonstrating the success of this type of wind turbines, which fed the generated power into sub-station in Rajasthan, thus strengthening the grid supply and improving quality of power under the service area of the substation. Hence the project leads to technological well being.
- The project technology manufactured, operated & maintained indigenously and doesn't involve any technology transfer from foreign countries.

A.3. Project participants:

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Name of Party involved(*) ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
India (host)	Kishangarh Hi-tech Textile Park Ltd. (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.		

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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India

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

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Rajasthan (State)

A.4.1.3. City/Town/Community etc:

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Village: Habur, District: Jaisalmer, State: Rajasthan, Country: 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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Project WTG Titled	UID	Latitude				Longitude			
Kishangarh Hi-tech Textile Park Ltd.	MK 5	N	27°	10’	46.9”	E	70°	38’	12.0”
	MK 6	N	27°	10’	40.3”	E	70°	38’	29.7”
	MK 7	N	27°	10’	33.7”	E	70°	38’	47.4”
	MK 8	N	27°	10’	18.2”	E	70°	39’	00.9”
Total Capacity	**8.4 MW**								

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

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Since the capacity of the project activity is only 8.4 MW, which is less than the maximum qualifying capacity of 15 MW for small scale, the project activity has been considered as a small scale CDM project activity and UNFCCC indicative simplified modalities and procedures are applied.

According to APPENDIX B of “Simplified modalities and procedures for small-scale clean development mechanism project activities” the type and category of project activity are tabulated below:

Project Type : I – Renewable Energy Projects

Project Category : I.D. – Grid connected renewable electricity generation (Version 17, EB 61)

Wind power technology details – The technology employed, converts wind energy to electrical energy. In wind power generation, energy of wind is converted into mechanical energy and subsequently into electrical energy. The project activity is the installation of an environmentally safe and sound technology since there are no GHG emissions associated with the electricity generation.
The technical specifications of the WTGs have been provided as below. There is no transfer of technology involved in the project activity.

The project activity consists of WTGs of Following Machines:-

Capacity of machine Installed	Machine Manufacturer
2100 KW	Suzlon Energy Limited

- Technical details for 2100 KW Machine manufactured by Suzlon Energy Limited

SR. NO.	PARTICULARS	DETAILS
1	Rated power	2.1 MW
2	Cut-in wind speed	4 m/s
3	Rated wind Speed	14 m/s
4	Cut-out wind speed	25 m/s
5	Hub height	79 m (Foundation top equal to ground level)
6	Rotational Speed	15 to 17.6 rpm
7	Swept area	6082 m square

8	Type	Tubular Tower (4 sections)
10	Gear box Ratio	1:98.8
11	Rated power	2100 kW

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

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Years	Estimation of annual emission reductions in tonnes of CO2 e
Year 1[2]	13,081
Year 2	13,081
Year 3	13,081
Year 4	13,081
Year 5	13,081
Year 6	13,081
Year 7	13,081
Total estimated reductions (tonnes of CO2 e)	91,567
Total number of crediting years	7
Annual average of the estimated reductions over the crediting period (t CO2 e)	13,081

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

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No funding from Annex I countries is involved in the identified project activity.

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

According to Appendix C to the Simplified Modalities and Procedures for Small-Scale CDM project activities, "De-bundling" is defined as fragmentation of large scale project activity in to smaller parts. A small scale project activity that is a part of large scale project activity is not eligible to use the simplified modalities and procedure for small scale project activity. A small project activity shall be deemed to be a de-bundled component of large scale project activity, if there is a registered small scale CDM project activity or an application to register another small scale CDM project activity.

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

The proposed CDM Project activity is not a debundled component of a large scale activity as there is no another small scale project activity belonging to any of Project participant with the same project category

[2] Calendar year. Crediting period will start from the date mentioned under section C.2.1.1

and technology which is registered within the previous two years and whose project boundary is within 1 km of the project boundary of the proposed small scale project activity. There is also no application submitted by any of the Project participant to register another small-scale project activity with the same project category and technology and whose project boundary is within 1 km of the project boundary of the proposed small scale project activity.

This means that the project activity does not fall under the de-bundled category and qualifies for small scale CDM Project.

SECTION B. Application of a baseline and monitoring methodology

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

>>
The methodology applicable to this project activity is "Grid connected Renewable Electricity Generation – AMS-I.D.", Version 17, Sectoral Scope: 01.
Title: Grid connected renewable electricity generation

Reference : AMS I. D (Version 17, EB 61)
Type I : Renewable Energy Projects
Category : "I.D", Grid connected Renewable Electricity Generation
AMS ID draws upon the following tool which has been used in the PDD:

1. Tool to calculate the Emission Factor for an Electricity System, Version 02.2.0, Annex 12, EB 61 report.[3]

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

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The total output of project activity is 8.4 MW which is less than 15 MW (electrical) threshold capacities, thus it qualify to apply the SSC methodology.

As per Meth. AMS I D, Version 17

Applicability Criterion (with para number reference)	Project Status
1. This category comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass: (a) Supplying electricity to a national or a regional grid. (b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.	The project activity is the Renewable Energy Project i.e. Wind Power Project that supply electrical power to the known consumer.
2. Illustration of respective situations under which each of the methodology (i.e. AMS-I.D, AMS-I.F and AMS-I.A) applies is included in Table 2[4]	The 1st & 3rd option of Table 2 of AMS ID Version 17, EB 61 is applicable (please refer footnote).

[3] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.2.0.pdf

Applicability Criterion (with para number reference)	Project Status
3. This methodology is applicable to project activities that (a) install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).	The project activity is the Renewable Energy Project i.e. Wind Power Project that supply electrical power to the electricity grids i.e., NEWNE. It's an Greenfield project thus Option A is applicable i.e. (a) install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant).
4. Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: • The project activity is implemented in an existing reservoir with no change in the volume of reservoir; • The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m2; • The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m2.	Not applicable, the project activity is the Renewable Energy Project i.e. Wind Power Project.

	Project type	AMS-I.A	AMS-I.D	AMS-I.F
1	Project supplies electricity to a national/regional grid		√	
2	Project displaces grid electricity consumption (e.g. grid import) and/or captive fossil fuel electricity generation at the user end (excess electricity may be supplied to a grid)			√
3	Project supplies electricity to an identified consumer facility via national/regional grid (through a contractual arrangement such as wheeling)		√	
4	Project supplies electricity to a mini grid[4] system where in the baseline all generators use exclusively fuel oil and/or diesel fuel			√
5	Project supplies electricity to household users (included in the project boundary) located in off grid areas	√		

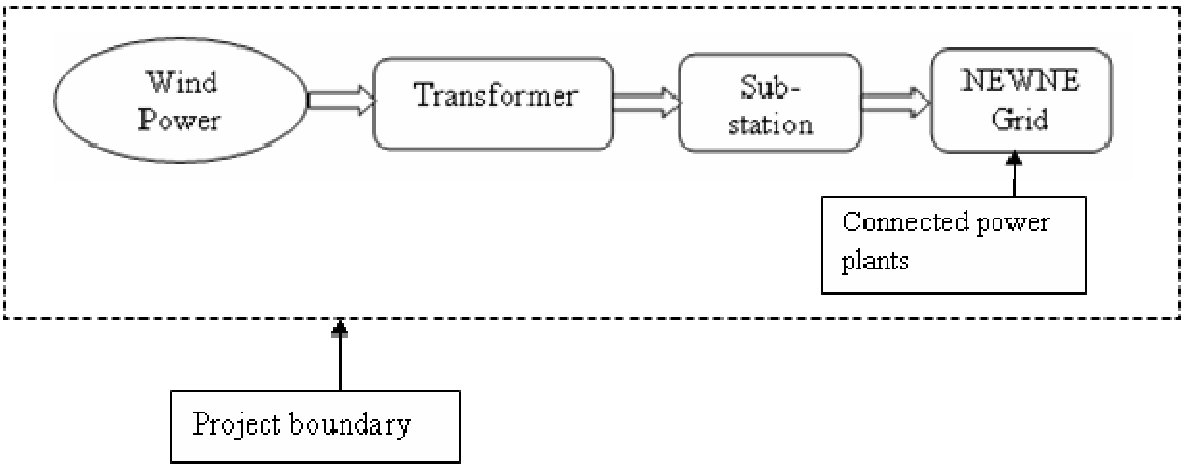
Applicability Criterion (with para number reference)	Project Status
5. If the new unit has both renewable and non-renewable components (e.g., a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	Not applicable, the project activity is the Renewable Energy Project i.e. Wind Power Project
6. Combined heat and power (co-generation) systems are not eligible under this category.	Not applicable, the project activity is the Renewable Energy Project i.e. Wind Power Project
7. In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	Not applicable.
8. In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.	Not applicable, the project activity is the Renewable Energy Project i.e. Wind Power Project

B.3. Description of the project boundary:

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As per AMS I. D Version 17, EB 61 –"The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to".
The project boundary includes the wind turbine generator, sub-stations and all equipments in between.

Fig. 2 Project Boundary



B.4. Description of baseline and its development:

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As per para 10 of the methodology AMS I D Version 17,
"The baseline scenario is that the 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 into the grid."
The proposed project activity will evacuate power to the NEWNE Grid & completely comply with the para 10 of AMS I D Ver17.
As per para 12 of the methodology AMS I D Version 17,

The Emission Factor can be calculated in a transparent and conservative manner as follows:

(a) A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the 'Tool to calculate the Emission Factor for an electricity system'.

OR

(b) The weighted average emissions (in t CO_2/MWh) of the current generation mix. The data of the year in which project generation occurs must be used.

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

Thus the Option (A) mentioned above is selected for baseline calculation. For this purpose the combined margin emission factor consisting of combination of Operating Margin (OM) and Build Margin (BM) has been taken from the published **database Version 06** of Central Electricity Authority (http://www.cea.nic.in/reports/planning/cdm_co2/user_guide_ver6.pdf).
The data base is consistent with the "Tool to calculate the emission factor for an electricity system" Version- 02.2.1 published by CDM Executive board.

The combined margin emissions factor is calculated as follows:

$EF_{CO2,\ grid,y} = EF_{OM} * W_{OM} + EF_{BM} * W_{BM}$

Where:

EF_{BM}: Build margin CO2 emission factor in year y (tCO2/MWh)
EF_{OM}: Operating margin CO2 emission factor in year y (tCO2/MWh)
W_{OM}: Weighting of operating margin emissions factor (%)
W_{BM}: Weighting of build margin emissions factor (%)

In case of wind power generation project $W_{OM} = 0.75$ and $W_{BM} = 0.25$

The baseline emissions are the product of electrical energy baseline $EG_{BL,y}$ expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission factor.

$BE_y = EG_{BL,y} * EF_{CO2,grid,y}$

Where:

BE_y	Baseline Emissions in year *y* (t CO_2)
$EG_{BL,y}$	Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year *y* (MWh)
$EF_{CO2,grid,y}$	CO_2 emission factor of the grid in year y (t CO_2/MWh)

Thus, $ER_y = BE_y - PE_y - LE_y$

$ER_y = BE_y - 0 - 0$ (as, $PE_y = 0$ and $LE_y = 0$)

$ER_y = BE_y$

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:

As per the Guidelines on the demonstration of additionality of small-scale project activities, to establish the project additionality, it has to be shown that the project activity would not have occurred anyway due to at least one of the following barriers:

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

The additionality of this wind power project is demonstrated by using the Investment barrier (option a) in accordance with *Guidelines on the demonstration of additionality of small-scale project activities (Version 09, EB 68, Annex 27) & Guidelines on the Assessment of Investment Analysis (Version- 5, EB-62, Annex- 5).*

(a) Investment barrier: a financially more viable alternative to the project activity would have led to higher emissions;

The project proponent is required to determine that the project activity is not:

- The most economically or financially attractive; or
- Economically or financially feasible, without the revenue from the sale of certified emission reductions (CERs).

- As per paragraph 19 of "Guidelines on the Assessment of Investment Analysis" (Version: 5, EB: 62, Annex: 5) - If the alternative to the project activity is the supply of electricity from a grid this is not to be considered an investment and a benchmark approach is considered appropriate. Hence, project promoter has considered Benchmark analysis to prove the additionality of the project.

The identified baseline (supply of electricity by grid) as well as project activity is in compliance with all applicable legal and regulatory requirements as

- The implementation of the project activity is a voluntary initiative as taken by the project proponent and is not mandatory or a legal requirement;
- The Electricity Act, 2003, does not restrict or allow any authority to restrict the fuel choice for power generation; and
- The applicable Environmental Regulations do not restrict the use of wind energy and there is no legal requirement on the selection of a particular technology.

For project specific evaluation in terms of the financial feasibility, the following has been explained:

Appropriateness of using benchmark analysis for additionality demonstration and its conformity to guidance 19 of Annex 13, EB 61

Considering the fact that the alternative to the project is the supply of electricity from the grid & the choice of the developer is to invest or not to invest , benchmark analysis has been considered appropriate for demonstration of additionality, which is in conformity with guidance 19 Annex 13 EB 61.

Benchmark - Internal Rate of Return (Equity IRR)

The benchmark value has been determined according to the "Tool for demonstration and assessment of additionality" (Version 5.2, Clause- 6(a), Sub-step- 2b, Option- III), which states that - Government bond rates, increased by a suitable risk premium to reflect private investment and/or the project type, as substantiated by an independent (financial) expert or documented by official publicly available financial data.

In the context of above project proponent has used Capital Asset Pricing Model (CAPM) for deciding benchmark for this project activity. CAPM is a model of linear general equilibrium return. In the CAPM theory, investors are assumed to have homogeneous expectations during the decision-making period. Investors make their decision only on the basis of the expected returns, standard deviations, and covariance of all pairs of security. According to CAPM, all investors hold only the market portfolio and riskless securities. The market portfolio is a portfolio comprised of all stocks in the market. The required rate of return is given by the following formula -

Required rate of return = $R_F + \beta \times (R_M - R_F)$
Where-
R_F = Risk free rate
β = Beta which shows risk
R_M = Market return

Risk free rate:
The risk free rate is the return on a security (or a portfolio of securities) that is free from default risk. Typically, the rate of long term government bonds is used to determine the risk free rate. In the context of the present project activity, YTM (Yield to Maturity) at primary issues over a period of 20 years has been considered to represent the risk free rate.

Market Risk Premium
The market risk premium is the difference between the expected market rate of return and the average risk free rate and is usually measured by looking at the average of the historical returns on a market portfolio. In the context of the present project activity, the period selected to calculate the expected market return is one year before the Offer Letter date.

Expected market rate of return
BSE-500 has been used for determining the market return (R_M).

Thus the market risk premium estimated is

Market risk premium = $R_M - R_F$

However, the market risk premium should not be viewed on a standalone basis. The overall risk premium depends on market risk premium as well as on a parameter called Beta, which has been explained below:

Beta

Equity Beta is the measure of the expected volatility of a particular stock relative to a well-diversified market portfolio. It measures the systematic risk of a stock, i.e. the risk that cannot be eliminated in a well-balanced, diversified portfolio. The beta of equity is calculated as the covariance between its return and the return on a well-diversified market portfolio, divided by the variance of the return on a well-diversified market portfolio.

Equity Beta = Covariance (R, R_M) / Variance (R_M)

In this case, BSE power index (since there is no any Index related to renewable energy in India) and BSE 500 (which represents a diversified index in the Indian Equity Markets) index has been taken for calculating value of Beta and Market return factor. The values of Risk free rate are referred from Reserve Bank of India.

Benchmark determination input values is based on publicly available data sources which can be clearly validated by the DOE, thus it complies with paragraph 13 of EB 61, Annex 13 -

The input values to calculate Benchmark are tabulated below:

Parameter	Value	Source
R_F	8.2628%	Month-end Yield to Maturity of SGL Transaction in Central Government Dated Securities for 10year Maturity http://www.rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=10986
β	0.97	Slope of Power Index w.r.t. BSE-500 (Market Index)
R_M	18.44%	Market Return of BSE-500 http://www.bseindia.com/histdata/hindices.asp http://bseindia.com/about/abindices/bse500.asp
Benchmark	18.15%	Calculated as per above formula

The input values to calculate IRR are tabulated below:

Details of the project (For 2.1 MW X 4 WTG)			
State where the project is situated		Rajasthan	As Per Offer Letter dated 15/01/2010
No. of machine		4	As Per Offer Letter dated 15/01/2010
Capacity /machine	MW	2.10	As Per Offer Letter dated 15/01/2010
Total Capacity	MW	8.40	Calculated
Expected Date of Commissioning		30/10/2010	As Per Offer Letter dated 15/01/2010

Generation and sale of electricity			
Net Plant load factor	Percent	18.74%	As per Third Party Report in accordance to para 3 (b) of Annex 11, EB 48.
Net Generation	kWh	13,789,642	Calculated
Transmission Charges	Percent	8.00%	As per RERC Order dated 02/02/2010
Annual generation considered for revenues	KWh	12,686,470	Calculated
Tariff rate	INR/KWh	5.00	Considered by PP at investment decision making on 15/03/2010
Wheeling Charges	INR/KWh	0.055	As per RERC Order dated 02/02/2010
Effective tariff rate	INR/KWh	4.945	Calculated
Fixed Charges	INR/KW/month	57.58	As per RERC Order dated 02/02/2010
Operation and maintenance cost and Insurance			
O&M charges	INR Million	10.15	As per offer letter dated 15/01/2010
Escalation in the O&M Expenses	Percent	5%	As per offer letter dated 15/01/2010
O&M free for	Year	1	As per offer letter dated 15/01/2010
Insurance Charges	INR Million	0.69	As per TAC order 2001[5]
Term loan			
Loan Amount	INR Million	227.92	As per CERC order[6] dated 03/12/2009, Pg 10
Interest rate	Percent	14.29%	As per CERC order dated 03/12/2009, Pg 13
Moratorium	Months	-	As per CERC order dated 03/12/2009, Pg 13
Repayment	Months	40	As per CERC order dated 03/12/2009, Pg 13
Repayment Instalment Value	INR Million	5.698	
1st instalment from		31/12/2010	
Financial parameters			
TOTAL COST	INR Million	460.00	As per offer letter dated 15/01/2010
Loan Amount	INR Million	322.00	Calculated considering 70% debt

[5] https://iib.gov.in/IRDA/tac/circulars/ecir2001.htm#cir8

[6] http://www.cercind.gov.in/2009/November09/284-2009_final_3rdDecember09.pdf

Equity	INR Million	138.00	Calculated considering 30% equity
Cost of land	INR Million	6.90	Assumed by PP as 1.5% of project cost at investment decision making on 15/03/2010
Salvage value (plant and machinery)	INR Million	45.31	As per CERC order dt. 09/11/2010
Net Depreciable Value	INR Million	407.79	Calculated: Total project cost – salvage value – land cost
Residual Value	INR Million	52.21	Calculated: Salvage value + land cost
IT Depreciation rate	Percentage	80% (40% in first year as commissioning was expected in October 2010)	As per Income Tax Act
Tax Rates			
Income tax rate	Percentage	30.00%	As Per Income tax rule
MAT	Percentage	15.00%	As Per Income tax rule
Surcharge	Percentage	10.00%	As Per Income tax rule
Education cess	Percentage	3.00%	As Per Income tax rule
Service Tax	Percentage	10.00%	As Per Income tax rule
Final Tax Rates			
Income tax rate	Percentage	33.99%	As per host country tax regulations
MAT	Percentage	17.00%	As per host country tax regulations
Service Tax	Percentage	10.30%	As per host country tax regulations
Life of the plant	Years	20	As per WTG Manufacturers Specification

The result of the analysis is as follows –

Investor	Kishangarh Hi-tech Textile Park Ltd
Equity IRR without CDM	9.21%
Benchmark (equity IRR)	18.15%

This substantiates that the investment is not financially attractive (equity IRR for the project activity is less than the Benchmark equity IRR) for any of the investor. Thus it can be easily concluded that project activity is additional & is not business as usual scenario.

Sensitivity Analysis

As per Guidance 20 of Annex 13 of EB 61, only variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation and the results of this variation should be presented in the PDD and be reproducible in the associated spreadsheets. Guidance also states, "All parameters varied need not necessarily be subjected to both negative and positive variations of the same magnitude". The guideline also states, as a general point of departure, variations in the sensitivity analysis should at least cover a range of +10% and –10%, unless this is not deemed appropriate in the context of the specific project circumstances.

The identified parameters as per the guidelines are as -

1. PLF
2. O&M Cost
3. Project Cost
4. Tariff

The results of sensitivity analysis are as follows:

Equity IRR	Kishangarh Hi-tech Textile Park Ltd		
Variation %	-10%	Normal	10%
PLF	**5.71%**	**9.21%**	**12.79%**
O&M	**9.89%**	**9.21%**	**8.49%**
Project Cost	**11.97%**	**9.21%**	**7.05%**
Tariff rate	**5.67%**	**9.21%**	**12.84%**

The Tariff for HT-5 category was the same for 10 years since 2001, i.e., INR 4.01 per kWh. It was increased only in September 2011 to INR 5.00 per kWh. That amounts to a CAGR of 2.23%. The probability of the tariff increasing by this amount every year is negligible. Even if the tariff were to increase by this amount, the IRR would only reach 14.75%, much below the benchmark.

As evident from the results given above, the project remains additional even under the most favorable sensitive conditions variation.

Serious CDM Consideration Demonstration:-
Again, As per "GUIDANCE ON THE DEMONSTRATION AND ASSESSMENT OF PRIOR CONSIDERATION OF THE CDM" in Annex 13 in EB 62 Report,

Date	**Event**
15/03/2010	Board resolution for investing in the project activity and release of letter of intent to the supplier
16/03/2010	Purchase orders issued to supplier
19/08/2010	Email correspondence sent by PP to UNFCCC and Host country DNA on prior consideration of CDM
31/12/2010	Commissioning of project activity

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

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Baseline Estimation:

Baseline methodology for project category *I.D* has been detailed in paragraphs 10-19 of the approved small scale methodology *AMS I.D*. (Version 17, EB 61) Paragraph 12 of the approved methodology applies to this project activity, which states that:

The Emission Factor can be calculated in a transparent and conservative manner as follows:

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

OR

b.) The weighted average emissions (in t CO2/MWh) of the current generation mix. The data of the year in which project generation occurs must be used.

The emission factor has been calculated using option '*a*' above i.e. *combined margin* (as the data required to determined *weighted average emissions (in t CO_2/MWh) of the current generation mix* was not available at the time of submission of PDD for validation) by using "*Tool to calculate the emission factor for an electricity system" (Version- 02.2.1, EB- 63, Annex- 19).*

Step 1: Identify the relevant electricity systems

Central Electricity Authority, Ministry of Power, Government of India (Host Country) has given the delineations of the project electricity system and the connected electricity system in India. As per CEA, the Indian power system is divided into two regional grids, viz. NEWNE Grid & Southern Grid. Each grid covers several states as given in the following table. As the project activity is located in the State of Rajasthan, NEWNE Grid is the relevant electricity system.

Geographical Scope of Electricity Grid System:

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

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

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

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

The PP has chosen "*Option I: Only grid power plants are included in the calculation"* as the grid system in India is stable enough and off-grid generation is not significant.

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

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

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

Out of the above options, the simple OM method (option a) is used in India. The Dispatch data analysis OM is not used as off-grid generation is not significant in India as per step 2 above. Other methods cannot be currently applied in India due to lack of necessary data.

As per "*Tool to calculate the emission factor for an electricity system" (Version- 02.2.1, EB- 63, Annex-19)*, 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.

As per option (1), in India as per available data (most recent five years) with CEA, the low-cost/must-run resources constitute 17.76% which is less than 50% of total grid generation.

NEWNE Grid: Share of low cost / Must- run (% of net generation)					
Year	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**
Share of low cost / Must-run (% of net generation)	17.95%	18.46%	19.04%	17.41%	15.94%
Average of most recent 5 years	17.76%				
Table reference- CEA CO_2 Baseline Database (Version- 6.0, Date- March 2011)					

For the simple OM, the emissions factor is calculated using the *ex ante* option. As per this option, the emission factor has been determined once at the validation stage, thus no monitoring and recalculation of the emission factor during the crediting period is required.

As the project is a grid connected power plant, 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 has been used.

CEA has considered the CDM registered projects in the calculation of the operating margin (OM).

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

The simple OM may be calculated by one of the following two options:

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

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

Option B can only be used if:

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

The simple OM is calculated as per Option B below.

Option B: Calculation based on total fuel consumption and electricity generation of the system

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

$$\mathbf{EF}_{\mathbf{grid,\,OMsimple,y}} = \frac{\sum_{i}(\mathbf{FC}_{\mathbf{i,y}} \times \mathbf{NCV}_{\mathbf{i,y}} \times \mathbf{EF}_{\mathbf{CO2,i,y}})}{\mathbf{EG}_{\mathbf{y}}}$$

Where:

$EF_{grid,OMsimple,y}$	=	Simple operating margin CO_2 emission factor in year *y* (tCO_2/MWh)
$FC_{i,y}$	=	Amount of fossil fuel type *i* consumed in the project electricity system in year *y* (mass or volume unit)
$NCV_{i,y}$	=	Net calorific value (energy content) of 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_y	=	Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must-run power plants/units, in year *y* (MWh)
i	=	All fossil fuel types combusted in power sources in the project electricity system in year *y*
y	=	The relevant year as per the data vintage chosen in Step 3

For this approach (simple OM) to calculate the operating margin, the subscript *m* refers to the power plants/units delivering electricity to the grid, not including low-cost/must-run power plants/units, and including electricity imports to the grid. Electricity imports should be treated as one power plant *m*.

OM values have been referred from CEA Database which has referred the "*Tool to calculate the emission factor for an electricity system" (Version- 02.2.1, EB- 63, Annex- 19).* The value of operating margin emission factor is 0.9942 tCO_2/MWh.

OM calculation has been done *ex-ante* and hence OM value will remain fixed and need not be monitored during the crediting period.

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

As per the "*Tool to calculate the emission factor for an electricity system" (Version- 02.2.1, EB- 63, Annex- 19)*, project participants can choose between one of the following two options:

Option 1: *For the first crediting period, calculate the build margin emission factor 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. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period.*

Option 2: *For the first crediting period, the build margin emission factor shall be updated annually, ex post, including those units built up to the year of registration of the project activity or, if information up to the year of registration is not yet available, including those units built up to the latest year for which information is available. For the second crediting period, the build margin emissions factor shall be calculated ex ante, as described in Option 1 above. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used.*

The PP has opted for Option 1.

Capacity additions from retrofits of power plants are not included in the calculation of the build margin emission factor.
The value of BM has been referred from CEA CO_2 Baseline Database (Version- 6.0, Date- March 2011) which has been calculated by "*Tool to calculate the emission factor for an electricity system" (Version- 02.2.1, EB- 63, Annex- 19).*

As per the "*Tool to calculate the emission factor for an electricity system" (Version- 02.2.1, EB- 63, Annex- 19)*, the build margin emissions factor is the generation-weighted average emission factor (tCO_2/MWh) of all power units m during the most recent year y for which electricity generation data is available, calculated as follows:

$$\mathbf{EF}_{\mathbf{grid,BM,y}} = \frac{\sum_{m} \mathbf{EG}_{\mathbf{m,y}} \times \mathbf{EF}_{\mathbf{EL,m,y}}}{\sum_{m} \mathbf{EG}_{\mathbf{m,y}}}$$

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 electricity generation data is available

The value of the BM has been calculated by CEA as 0.8123 tCO_2/MWh. BM calculation has been done *ex-ante* and hence BM value will remain fixed and need not be monitored during the crediting period.

Step 6: Calculate the combined margin (CM) emissions factor

The calculation of the combined margin (CM) emission factor (*EFgrid,CM,y*) is based on one of the following methods:

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

The weighted average CM method (option A) should be used as the preferred option. The simplified CM method (option b) can only be used if:

- The project activity is located in a Least Developed Country (LDC) or in a country with less than 10 registered CDM projects at the starting date of validation; and

- The data requirements for the application of step 5 above cannot be met.

(a) Weighted average CM

The combined margin emissions factor is calculated as follows:

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

Where

$EF_{grid,OM,y}$	=	Operating Margin CO_2 Emission Factor (tCO_2/MWh)
$EF_{grid,BM,y}$	=	Build Margin CO_2 Emission Factor (tCO_2/MWh)
W_{OM}	=	Weighting of operating margin emission factor (%)
W_{BM}	=	Weighting of build margin emission factor (%)

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

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

- All other projects: W_{OM} = 0.5 and W_{BM} = 0.5 for the first crediting period , and W_{OM} = 0.25 and W_{BM} = 0.75 for the second and third crediting period,6 unless otherwise specified in the approved methodology which refers to this tool.

Alternative weights can be proposed, as long as $W_{OM} + W_{BM} = 1$, for consideration by the Executive Board, taking into account the guidance as described below. The values for $W_{OM} + W_{BM}$ applied by project participants should be fixed for a crediting period and may be revised at the renewal of the crediting period.

The PP has opted for weighted average CM. Thus, the combined margin emissions factor is calculated as follows:

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

Where

$EF_{grid,OM,y}$ = Operating Margin CO_2 Emission Factor (tCO_2/MWh)
$EF_{grid,BM,y}$ = Build Margin CO_2 Emission Factor (tCO_2/MWh)
W_{OM} = Weighting of operating margin emission factor (%)
W_{BM} = Weighting of build margin emission factor (%)

Thus, the grid emission factor for NEWNE Grid is calculated *ex ante* as below:

$$EF_{grid,CM,y} = 0.75 \times EF_{grid,OM,y} + 0.25 \times EF_{grid,BM,y}$$
$$= 0.75 \times 0.9942 + 0.25 \times 0.8123$$
$$= 0.9487\ tCO_2/MWh$$

Baseline Emissions (BE_y):

The product of *Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y* in MWh with *CO_2 Emission Factor of the grid in year y* in tCO_2/MWh will give the estimated value of Baseline Emissions tCO_2 (BE_y).

$$BE_y = EG_{BL,y} \times EF_{CO2,grid,y}$$

Project Emissions (PE_y):

As per paragraph 20 of approved methodology AMS- I.D. (Version- 17, EB- 61), *For most renewable energy project activities, PE_y = 0. However, for the following categories of project activities, project emissions have to be considered following the procedure described in the most recent version of ACM0002.*

- *Emissions related to the operation of geothermal power plants (e.g. non-condensable gases, electricity/fossil fuel consumption)*
- *Emissions from water reservoirs of hydro power plants*

As the project activity is a wind power generation, the project emissions are considered zero.

Leakage Emissions (LE_y):

As per paragraph 22 of the approved methodology AMS- I.D. (Version- 17, EB- 61), *If the energy generating equipment is transferred from another activity, leakage is to be considered.* The leakage emissions may be considered as zero tCO_2 as no such equipment shall be transferred from another project activity.

Emission Reductions (ER_y):

The emission reductions (ER_y) are calculated as per paragraph 23 of AMS- I.D. (Version- 17, EB- 61).

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

Where

ER_y = Emission reductions in year y (tCO_2/y)
BE_y = Baseline Emission in year y (tCO_2/y)
PE_y = Project Emission in year y (tCO_2/y)

LE_y = Leakage Emission in year y (tCO_2/y)

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

Data / Parameter:	$EF_{CO2,grid,y}$
Data unit:	tCO_2 / MWh
Description:	Combined margin CO_2 emission factor for the project electricity system.
Source of data used:	CEA CO_2 Baseline Database (Version- 6.0, Date- March 2011)
Value applied:	0.9487
Justification of the choice of data or description of measurement methods and procedures actually applied :	The *CO_2 Baseline Database* is the most authentic data available in India since it has been prepared & published by Central Electricity Authority, Government of India. The $EF_{grid, CM, y}$ calculation is based on equation 13 of the '*Tool to calculate the emission factor for an electricity system*' *(Version- 02.2.1, EB- 63, Annex- 19)* which is given below as: $EF_{grid,CM,y} = 0.75 \times EF_{grid,OM,y} + 0.25 \times EF_{grid, BM,y}$
Any comment:	The calculation is done as *ex ante.*

Data / Parameter:	$EF_{grid, OM, y}$
Data unit:	tCO_2/MWh
Description:	Operating margin CO_2 emission factor for the project electricity system.
Source of data used:	CEA CO_2 Baseline Database (Version- 6.0, Date- March 2011)
Value applied:	0.9942
Justification of the	The *CO_2 Baseline Database* is the most authentic data available in India since it

choice of data or description of measurement methods and procedures actually applied :	has been prepared & published by Central Electricity Authority, Government of India. The $EF_{grid, CM, y}$ calculation is based on the guidelines in '*Tool to calculate the emission factor for an electricity system*' *(Version- 02.2.1, EB- 63, Annex- 19)*
Any comment:	The calculation is done as *ex ante.*

Data / Parameter:	$EF_{grid, BM, y}$
Data unit:	tCO_2/MWh
Description:	Build margin CO_2 emission factor for the project electricity system.
Source of data used:	CEA CO_2 Baseline Database (Version- 6.0, Date- March 2011)
Value applied:	0.8123
Justification of the choice of data or description of measurement methods and procedures actually applied :	The *CO_2 Baseline Database* is the most authentic data available in India since it has been prepared & published by Central Electricity Authority, Government of India. The $EF_{grid, CM, y}$ calculation is based on the guidelines in '*Tool to calculate the emission factor for an electricity system*' *(Version- 02.2.1, EB- 63, Annex- 19)*
Any comment:	The calculation is done as *ex ante.*

B.6.3 Ex-ante calculation of emission reductions:

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The relevant equation & calculations had been mentioned at Section B.6.1 of this PDD, thus kindly refer the same.

Emission reductions are calculated as follows:

$$ER_y = BE_y – PE_y – LE_y \quad (1)$$

Where:

ER_y Emission reductions in year *y* (t CO_2/y)

BE_y Baseline Emissions in year *y* (t CO_2/y)

PE_y Project emissions in year *y* (t CO_2/y)

LE_y Leakage emissions in year *y* (t CO_2/y)

As per para 20 of AMS I D Version 17

For most renewable energy project activities, $PE_y = 0$

As per para 22 of AMS ID Version 17

If the energy generating equipment is transferred from another activity, leakage is to be considered.

It is not applicable for the project activity, thus leakage emissions are considered to be zero.

$LE_y = 0$

Thus, $ER_y = BE_y$

Thus, $ER_y = BE_y - PE_y - LE_y$

$ER_y = BE_y - 0 - 0$ (as, $PE_y = LE_y = 0$)

The summary of the same is as:-
$ER_y = BE_y$

Emission reductions in year *y* (t CO_2/y) = Baseline Emissions in year *y* (t CO_2/y)

Parameter	**Unit**	**Value**
WTG Capacity	MW	2.1
Number of WTG	Quantity	4
Installed capacity of project activity	MW	8.4
Net PLF	%	18.74%
Net Power Generation	MWh/annum	13789.0 (rounded down for conservative estimate)
Connection of grid	NEWNE or Southern	NEWNE Grid
Grid Emission Factor	tCO2/ MWh	0.9487
Baseline Emissions	**tCO2/annum**	**13,081**

Baseline Emission Reductions for the project activity	**tCO2/annum**	**13,081**

Project Emissions for the project activity	**tCO2/annum**	**0**

Leakage Emission for the Project Activity	**tCO2/annum**	**0**

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

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The ex-ante estimation of aggregate emission reductions for 7 years of the crediting period of the project activity is as follows:

Year	Estimated Project Activity Emissions (tonnes of CO2e)	Estimated Baseline Emissions (tonnes of CO2e)	Estimated Leakage (tonnes of CO2e)	Estimated Emission Reduction (tonnes of CO2e)
Year 1	0	13,081	0	13,081
Year 2	0	13,081	0	13,081
Year 3	0	13,081	0	13,081
Year 4	0	13,081	0	13,081
Year 5	0	13,081	0	13,081
Year 6	0	13,081	0	13,081
Year 7	0	13,081	0	13,081
Total	0	91,567	0	91,567

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

B.7.1 Data and parameters monitored:

Data / Parameter:	EG_{Bly}
Data unit:	MWh /year
Description:	Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year *y*
Source of data to be used:	Breakup of Net Export as per Monthly Generation Report and Joint Meter Reading authorized by R.R.V.P.N.L. The quantity of net electricity supplied to the grid (i.e. Net Export in kWh) by the project activity will be taken from the break-up sheet prepared by Suzlon India Limited on the basis of monthly Joint Meter Reading (JMR) certificate certified by Rajasthan Rajya Vidyut Prasaran Nigam Limited (RRVPNL). The value for net electricity supplied to the grid will be cross verified from the monthly invoice raised by the project participant.
Value of data	13,789.0
Description of measurement methods and procedures to be applied:	**Net electricity delivered to the Grid:** The net electricity delivered to the Grid by the given WTG for the given month (net export kWh) is obtained by subtracting import from export as below: $EG_{Bly} = EG_{,Export,Project,y} - EG_{,Import,Project,y}$ The values of the net electricity delivered to the Grid are aggregated annually to get $EG_{BL,y}$. The value of net electricity delivered to the Grid ($EG_{BL,y}$) by the project activity per annum is converted to MWh before the calculation of emission reductions. The details on the calculation of net electricity exported to grid and the apportioning mechanism adopted are explained in detail under section B.7.2.

QA/QC procedures to be applied:	The energy meter reading are taken on monthly basis Annual Testing of all the meters will be undertaken and faulty meters will be duly replaced immediately. However the meters will be calibrated at-least once in 3 years. The Net Units generated will be cross checked against the invoice raised by the PP towards the Discom
Any comment:	Data will be archived in electronic form for two years after the end of crediting period or of the last issuance of CERs for this project activity, whichever occurs later.

Data / Parameter:	$EG_{Export,Project,y}$
Data unit:	MWh /year
Description:	Quantity of electricity exported to the grid as a result of the implementation of the CDM project activity in year *y*
Source of data to be used:	Monthly Generation Report and Joint Meter Reading authorized by R.R.V.P.N.L. The value for electricity exported to the grid will be cross verified from the monthly invoice raised by the project participant.
Value of data	13,789.0
Description of measurement methods and procedures to be applied:	The details on the calculation of electricity exported to grid and the apportioning mechanism adopted are explained in detail under section B.7.2.
QA/QC procedures to be applied:	The energy meter reading are taken on monthly basis Annual Testing of all the meters will be undertaken and faulty meters will be duly replaced immediately. However the meters will be calibrated at-least once in 3 years. The electricity exported will be cross checked against the invoice raised by the PP towards the Discom
Any comment:	Data will be archived in electronic form for two years after the end of crediting period or of the last issuance of CERs for this project activity, whichever occurs later.

Data / Parameter:	$EG_{Import,Project,y}$
Data unit:	MWh /year
Description:	Quantity of electricity imported the grid as a result of the implementation of the CDM project activity in year *y*
Source of data to be used:	Monthly Generation Report and Joint Meter Reading authorized by R.R.V.P.N.L. The value for electricity imported from the grid will be cross verified from the monthly invoice raised by the project participant.
Value of data	0 (for ex-post calculations)
Description of measurement methods and procedures to be	The details on the calculation of electricity imported from the grid and the apportioning mechanism adopted are explained in detail under section B.7.2.

applied:	
QA/QC procedures to be applied:	The energy meter reading are taken on monthly basis Annual Testing of all the meters will be undertaken and faulty meters will be duly replaced immediately. However the meters will be calibrated at-least once in 3 years. The electricity exported will be cross checked against the invoice raised by the PP towards the Discom
Any comment:	Data will be archived in electronic form for two years after the end of crediting period or of the last issuance of CERs for this project activity, whichever occurs later.

Data / Parameter:	**$EG_{Controller,y}$**
Data unit:	MWh /year
Description:	Electricity generated by installed WTG of PP connected to particular feeder
Source of data to be used:	Record of metering available at Central Monitoring Station for the project activity
Value of data	13,789.0
Description of measurement methods and procedures to be applied:	Each WTG in Wind Farm is equipped with controller meter located inside the WTG. The controller meter provides daily generation report from each WTGs. The controller meter located in each WTG is a microprocessor based intelligent controller which controls entire turbine operation and record energy generation with basic signal of CT and PT .The controller meter does not require calibration as it is self calibration type. Further, controller will stop the turbine if it detects any error in measurement therefore avoids the uncertainty in the generation data.
QA/QC procedures to be applied:	The monitoring of all these wind turbines is performed from a common monitoring station as a part of central monitoring system. The system consists of a state- of- the- art monitoring station connected via optic cables to individual WTG. CMS managed by well trained staff personnel. The personal are always present on site to monitor various parameters of power generation and deal with any problems related to generation, transmission or maintenance.
Any comment:	Data will be archived in electronic form for two years after the end of crediting period or of the last issuance of CERs for this project activity, whichever occurs later.

B.7.2 Description of the monitoring plan:

Monitoring of the project activity:

The monitoring of the project activity is given as below:

- The electricity generated by the project activity WTG/s is evacuated to the pooling station at 33 kV/220 kV level. The project activity WTG/s along with other WTGs, are connected to the feeder-wise metering point/s, where each metering point consists of both main & check meters. These energy meters are having accuracy class of 0.2s.

- The joint meter reading is taken on monthly basis at these metering point/s at particular feeders by the representatives of PP & State Utility, which records parameters like export, import.
- All these metering points are further connected to the common delivery point at the 220 kV level.
- The common metering point at 220 kV GSS concurrently records total electricity (total export and total import) received from all connected metering points. The common metering point consists of both main & check meters. These energy meters are having accuracy class of 0.2s. The monthly JMR is taken by the representative of PP & State Utility.
- Billing of the energy will be done based on the energy break up available at the metering at 220 kV level.
- The monitoring & measurement of electricity will be done on continuous basis; while recording will be done on monthly basis as Joint Meter Reading by the representatives of State Utility & PP.
- The value of monthly export by the project activity along with import and net export will be recorded in the monthly Break up of net export units report.
- The values of monthly export & import by the project activity recorded in the monthly Break up of net export units report is calculated based on the apportioning method by the state utility.
- The meters shall be approved, tested & sealed by the State Utility. The meters are in the custody of State Utility.
- The calibration of the meters will be carried out at least once in three years (as per paragraph 17 (c) of General Guidelines to SSC CDM methodologies, Version 17).
- In the absence or delay in meter calibration - appropriate guideline will be applied to confirm the conservativeness of emission reductions.
- The net electricity supplied to the grid will be converted to MWh for calculation of emission reductions.
- Data will be archived in electronic form for two years after the end of crediting period or of the last issuance of CERs for this project activity, whichever occurs later.
- The PP is responsible for data collection & archiving.

Sample Apportioning Procedure:

The apportioning of the electricity is the responsibility of the State Utility. The sample apportioning procedure adopted for any given WTGs in project activity for any given month is given below:

Generation Ratio at metering point (33 kV/220 kV level GSS):
The generation ratio for project activity is the ratio of electricity generated by installed WTG of PP to the total generation by all the connected WTGs to the applicable metering point.

$$G_{R,y} = EG_{Controller,y} / EG_{AllController,y} \quad \text{(a)}$$

Where,

$G_{R,y}$	: Generation Ratio at WTG for the project activity
$EG_{Controller,y}$	: Electricity generated by installed WTGs of PP connected to particular feeder
$EG_{AllController,y}$	: Total generation by all the connected WTGs to the particular feeder. This parameter is not in the control of the PP.

Calculation of net electricity exported at applicable metering point:
The Main and Check meters at the particular feeder measure a number of parameters including export and import for all the connected WTGs.

The import, kWh by the WTG at the metering point is calculated in the following manner:

$$\mathbf{EG_{Import,y} = G_{R,y} \times EG_{Import\ feeder,y}} \quad (b)$$

Where,

$EG_{Import,y}$: Import, kWh by the project WTG apportioned at metering point at particular feeder.

$G_{R,y}$: Generation Ratio at WTG for the project activity

$EG_{Import\ feeder,y}$: Total Import, kWh by all the WTGs at the metering point at particular feeder. This parameter is not within the control of the PP.

The export, kWh by the WTG at the metering point is calculated in the following manner:

$$\mathbf{EG_{Export,y} = G_{R,y} \times EG_{Export\ feeder,y}} \quad (c)$$

Where,

$EG_{Export,y}$: Export, kWh by the project WTG apportioned at metering point at particular feeder

$G_{R,y}$: Generation Ratio at WTG for the project activity

$EG_{Export\ feeder,y}$: Total Export, kWh by all the WTGs at the metering point at particular feeder. This parameter is not within the control of the PP.

The net electricity exported by the WTG at the 33 kV/220 kV level metering point is calculated by subtracting equation (b) from (c).

Thus, the net electricity exported at 33 kV/220 kV level metering point:

$$= \mathbf{EG_{Export,y} - EG_{Import,y}} \quad (d)$$

Transmission Loss Calculation:

The total transmission loss occurred during export/import of the electricity between the 33/220 kV level pooling station & 220 kV level common delivery point is calculated as per the guidelines under the Power Purchase Agreement and considered while calculating the net electricity supplied to the grid.

Calculation of net electricity delivered to the Grid (EG_{Bly}):

The values of transmission loss during export & import for the given WTG are applied to get the values of $Export_{,Project}$ and $Import_{,Project}$ respectively for the given month.

The net electricity delivered to the Grid (EG_{Bly}) by the project activity for the given month (net export kWh) is then obtained by subtracting import from export. Thus,

$$EG_{Bly} = \mathbf{EG_{,Export,Project,y} - EG_{,Import,Project,y}} \quad (f)$$

The quantity of net electricity supplied to the grid (Net Export in kWh) i.e. EG_{Bly} by the project activity will be taken from the break-up sheet prepared by Suzlon India Limited on the basis of monthly Joint Meter Reading (JMR) certificate certified by Rajasthan Rajya Vidyut Prasaran Nigam Limited (RRVPNL) and shall be used for emission reduction calculations.

Operation & Maintenance of the Project:

Suzlon Infrastructure Services Ltd. is providing O&M services to the project promoter. Following services are provided by Suzlon Infrastructure Services Ltd.:

Routine Maintenance Services: Routine maintenance labour work involves making available suitable manpower for operation and maintenance of the equipment and covers periodic preventive maintenance, cleaning and upkeep of the equipment

Security Services: This service includes watch and ward and security of the wind turbines and the equipment.

Management Services:

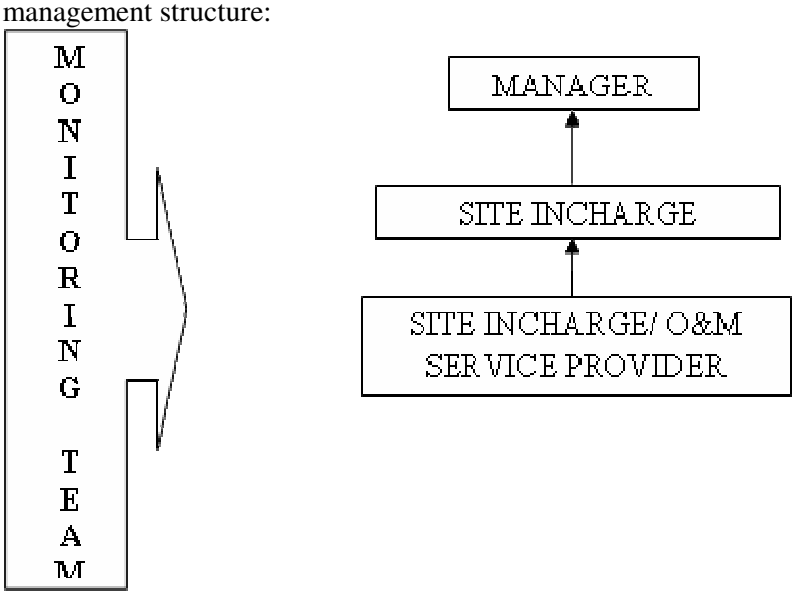
- ✓ Data logging for power generation, grid availability, machine availability.
- ✓ Preparation and submission of monthly performance report.
- ✓ Taking monthly meter reading jointly with utility of power generated at promoter's wind turbines and supplied to grid from the meter/s maintained by utility for the purpose and co-ordinate to obtain necessary power credit report/ certificate.

Technical Services:

- ✓ Visual inspection of the WTGs and all parts thereof.
- ✓ Technical assistance including checking of various technical, safety and operational parameters of the equipment, trouble shooting and relevant technical services

Operational & Management Structure:

The O & M Contractor for the project activity is an ISO 9001 certified company. The operational and management structure:



Organizational Structure for monitoring

Designation	Responsibilities
MANAGER	Holds complete control over monitoring aspects pertaining to the project
SITE INCHARGE	• Recording • Verification

	• Storage of Data
SITE INCHARGE/ O&M SERVICE PROVIDER	• Operation and Maintenance • Storage of data • Data Recording

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

>>

Date of completion of baseline & Monitoring Methodology: 13/07/2011

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Organization:	Kishangarh Hi-tech Textile Park Ltd.
Street/P.O.Box:	Bhat Mohalla, Madanganj
Building:	Agrawal Sadan,
City:	Kishangarh
State/Region:	Rajasthan
Postfix/ZIP:	305801
Country:	INDIA
Telephone:	01463 242877
FAX:	01463 242877
E-Mail:	info@khtpl.com
URL:	www.khtpl.com
Represented by:	
Title:	Director
Salutation:	Mr.
Last Name:	Agarwal
Middle Name:	Kumar
First Name:	Vijay
Department:	NA
Mobile:	
Direct FAX:	01463 242877
Direct tel:	01463 242877
Personal E-Mail:	khtpl2006@gmail.com

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:

>>
15/03/2010 (Letter of intent issued by PP to technology supplier)

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

>>
20 years 00 months

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

The project activity will use renewable crediting period.

C.2.1. Renewable crediting period

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

>>
30/10/2012 or Date of registration of project activity whichever is later.

C.2.1.2. Length of the first crediting period:

>>
07 years 00 months.

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

>>
Not applicable

C.2.2.2. Length:

>>
Not applicable

SECTION D. Environmental impacts

>>

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

>>

The project activity does not fall under the purview of Environmental Impact Assessment notification of the Ministry of Environment and Forests (MoEF), Government of India (GOI) and the project activity is exempted from environmental clearances.

Source - http://www.envfor.nic.in/legis/env_clr.htm

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:

>>

Not applicable.

SECTION E. Stakeholders' comments

>>

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

>>

The followings are the local stakeholders for the project activity:

- Local community
- Local village administration
- Technology suppliers
- Local vendors

All the stakeholders have been invited through submission of the personal invitation letters to attend the stakeholders meeting.

In the introductory speech, the representatives of EnKing International welcomed the gathering and informed the stakeholders about the project activity; project's associated benefits with respect to CO2 emission reductions and explained the purpose of conducting the stakeholder meeting in order to gather the views and comments of the local stakeholders on the project activity. Subsequent to the introductory speech, comments were received from the stakeholders.

The Minutes of meeting with commenting sheet from LSH, invitation letter receipt copy has been submitted to the DOE.-

Name of the PP	Invitation Date	Meeting Date	Location of the Local Stakeholder Meeting		
			Village	District	State
Kishangarh Hi-tech Textile Park Ltd.	07/03/2011	15/03/2011	Habur	Jaisalmer	Rajasthan

E.2. Summary of the comments received:

>>

Stakeholders had no objections from installations of WTGs; instead they have openly said that wind power projects helped them by:

- Additional revenue generated through land / lease to outsiders like contractors & their employees
- Job opportunities for day -to - day maintenance and security of WTGs
- Developments of roads
- No any adverse impact on rains, agriculture

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

>>

The stakeholders have given positive feedback and thus no measures were required to be taken.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Kishangarh Hi-tech Textile Park Ltd.
Street/P.O.Box:	Bhat Mohalla, Madanganj
Building:	Agrawal Sadan,
City:	Kishangarh
State/Region:	Rajasthan
Postfix/ZIP:	305801
Country:	INDIA
Telephone:	01463 242877
FAX:	01463 242877
E-Mail:	info@khtpl.com
URL:	www.khtpl.com
Represented by:	
Title:	Director
Salutation:	Mr.
Last Name:	Agarwal
Middle Name:	Kumar
First Name:	Vijay
Department:	NA
Mobile:	
Direct FAX:	01463 242877
Direct tel:	01463 242877
Personal E-Mail:	khtpl2006@gmail.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding for this project activity was received from annex 1 parties.

Annex 3

BASELINE INFORMATION
(Source: Central Electricity Authority, CO2 baseline database, Ver 6.0)

Weighted Average Emission Rate (tCO2/MWh) (incl. Imports) (2)

	2006-07	2007-08	2008-09	2009-10
NEWNE	0.82	0.81	0.83	0.82
South	0.72	0.72	0.76	0.75
India	0.80	0.79	0.82	0.81

Simple Operating Margin (tCO2/MWh) (incl. Imports) (1) (2)

	2006-07	2007-08	2008-09	2009-10
NEWNE	1.01	1.00	1.01	0.98
South	1.00	0.99	0.97	0.94
India	1.01	1.00	1.01	0.98

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

	2006-07	2007-08	2008-09	2009-10
NEWNE	0.63	0.60	0.68	0.81
South	0.70	0.71	0.82	0.76
India	0.65	0.63	0.71	0.80

Combined Margin in tCO2/MWh (incl. Imports) (1) (2)

	2006-07	2007-08	2008-09	2009-10
NEWNE	0.82	0.80	0.84	0.90
South	0.85	0.85	0.90	0.85
India	0.83	0.81	0.86	0.89

Annex 4

MONITORING INFORMATION

Please refer section B.7.1 and B.7.2 for information on monitoring.

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