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:

Title: 2.10 MW Wind Power Project by M/s Chhotabhai Jethabhai Patel & Co. (CJP) at Belwa Ranaji Village, Shergarh Taluka, Jodhpur District, Rajasthan, India.
Version: 03
Date: 03/01/2011

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

Purpose of the project activity:

The project activity involves grid connected renewable electricity generation by using wind turbine generator. The project activity is having a total capacity of 2.10 MW (1 No. × 2.10 MW). The project activity is based in Belwa Ranaji Village, Shergarh Taluka, Jodhpur District, Rajasthan, India. The wind technology is supplied by Suzlon Energy Limited. The class of wind turbine is S-88.

The project activity has been commissioned on 27th February 2010[1]. The project activity is connected to the NEWNE Grid of India. The NEWNE Grid of India is mostly dominated by the GHG emitting fossil power plants. The implementation of this project activity has resulted into avoidance of GHG emissions. The avoided GHG mainly consists of CO_2.

The project is estimated to generate 3,741 MWh of electricity per year and concurrently achieving emission reductions of 3,445 tonnes of CO_2 during same period.

Prior to the project activity, the NEWNE Grid was sourcing the equivalent amount of the electricity from the fossil fuel fired power plants in the grid region. The project activity has resulted into displacement of equivalent amount of grid electricity. This has resulted into mitigation of GHG emissions.

The baseline scenario for the project activity is same as the condition prior to the project activity.

The project activity is promoted and developed by Chhotabhai Jethabhai Patel & Co. (CJP hereafter) CJP is a partnership firm & is part of well known CEEJAY Group, based in Nadiad, Gujarat, India.
By implementing this project, PP has taken initiative towards achieving sustainable development goals in the local region of Rajasthan in both direct & indirect way.

Sustainable development:

Social well being:

The project activity during its entire life will be responsible in improving the social conditions in the nearby region. Some of the aspects are considered below:

- Development of infrastructure like road network, school, temple, street lighting etc

[1]Commissioning certificate dated 16/03/2010 issued by RDPPC, Jodhpur Discom

- Free medical facilities for locals by Suzlon Locals can use Suzlon ambulance in case of medical emergency
- Generation of local employment for driver, security, technicians, engineers etc.
- Alleviate poverty by generating additional employment
- Removal of social disparities
- Improving quality of life of people
- Improving local economy
- Project activity will spread awareness regarding issues like climate change amongst the locals and visitors
- Awareness among local people regarding wind power & its effect on rain and ground water level

Environmental well being:

The project activity is a clean source of power generation. The environmental aspects in consideration are as follows:

- In comparison to other sources of power generation prevailing in the project grid region, wind power is one of the cleanest power generation modes
- Project activity does not involve release of pollutants in air, water or soil
- As compared to other power plants, less amount of land is required for wind power generation
- No or less biodiversity loss which may occur in some other power plants like hydro
- Less noise pollution
- Conservation of conventional fuels

Overall wind power is benign to environment as compared to conventional power generation.

Technological well being:

The technology utilized in this project activity is S-88 class. The capacity i.e. 2.10 MW is the highest single capacity available in India.

- The S 88-2.1 MW is designed to withstand extreme conditions and operate effectively with low maintenance costs
- The project activity will lead to transfer of environmentally safe and sound technologies that are comparable to best practices in order to assist in up gradation of the technological base in the local region
- The transfer of technology can be within the country as well from other countries also
- The technology is currently available in India, Brazil, Italy, Nicaragua, Portugal, Romania, Spain, Turkey, America, Australia & China

Economical well being:

Economic well being refers to additional investment consistent with the needs of the local community. The project in due course of time will draw additional investment to the region. In general, the project activity envisages following economic benefits:

- Employment opportunities
- Reduced rate of migration to urban area
- Market facilities for local products

- Industrial development
- Improvement of a rural economy
- Flow of goods and services
- Project will lead to attract additional investment/opportunities in the local region

Although the realization of the above benefits would take a longer time needlessly, the economic development of the region would be attributed to the project operation. The project will contribute to the sustainable development of the region during its entire operational life.

A.3 Project participants:

Name of Party involved (*)((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
India (Host Party)	M/s Chhotabhai Jethabhai Patel & Co. (CJP) (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:

A.4.1.1 Host Party(ies):

India

A.4.1.2 Region/State/Province etc.:

Rajasthan

A.4.1.3 City/Town/Community etc:

Belwa Ranaji, Shergarh

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

The project activity is located at Belwa Ranaji (Location No. RKB-24/389), Shergarh Taluka, Jodhpur District, Rajasthan, India. The nearest railway station and airport is Jodhpur located at a distance of 170 km (approx) from WTG site. The details of physical location, including information allowing the unique identification of the project location is given below:

Capacity	Location No.	Location	Generator Serial No[2]	Latitude	Longitude	Date of Commissioning
1× 2.10 MW	RKB- 24	Belwa Ranaji	521090076	N 26°28'32.0"	E 72°30'13.4"	27/02/2010

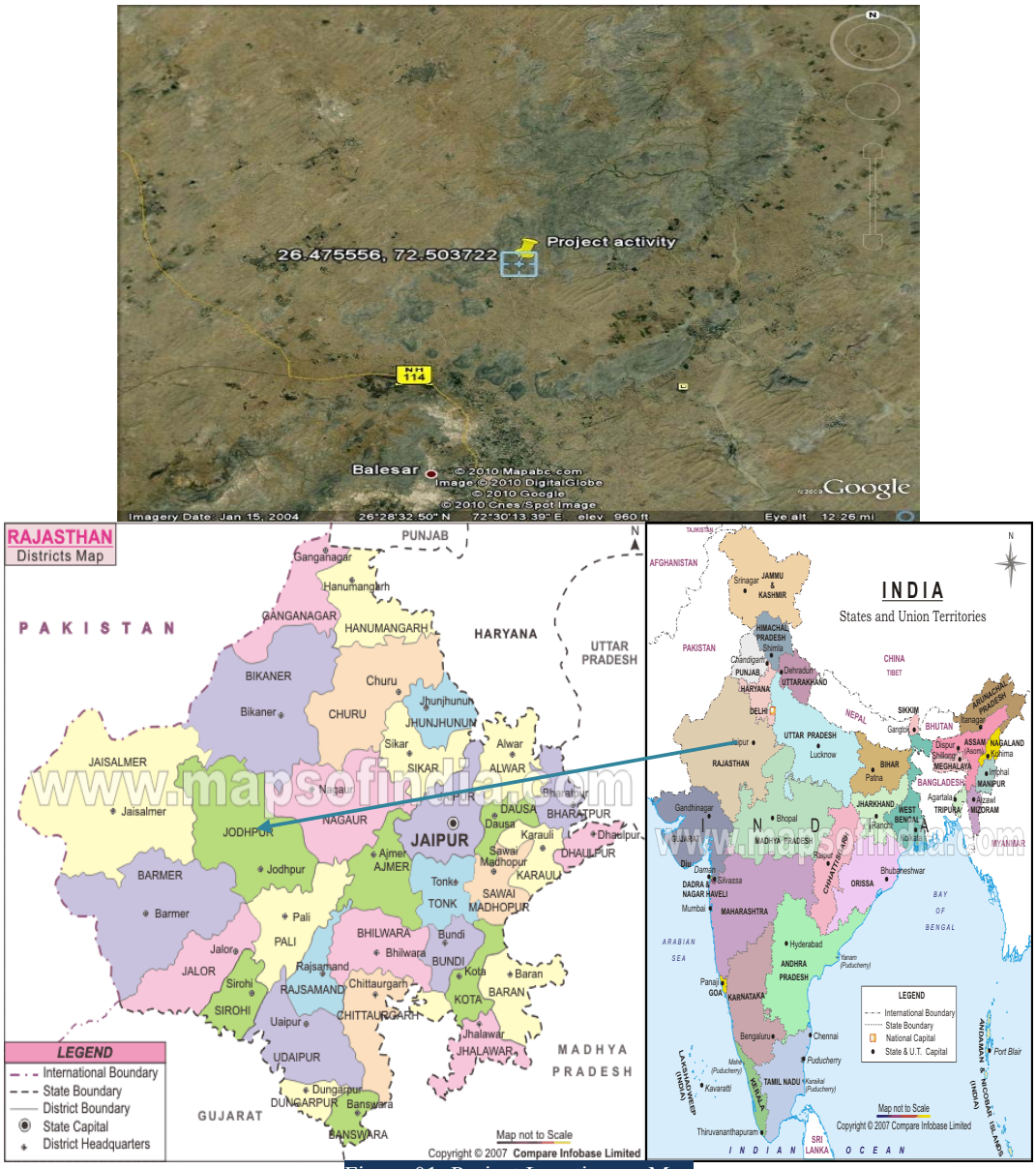

Figure 01: Project Location on Map

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

[2] Commissioning certificate dated 16/03/2010 issued by RDPPC, Jodhpur Discom

The project is a small scale CDM project activity. According to the Appendix B of the simplified modalities and procedures (M & P) for small-scale CDM project activities, the project activity falls under the following type and category.

Project Type	**:**	Type I – Renewable Energy Projects
Project Category[3]	**:**	I.D. – Grid connected renewable electricity generation
Reference[4]	**:**	Appendix B Of The Simplified Modalities And Procedures For Small-Scale CDM Project Activities Indicative Simplified Baseline And Monitoring Methodologies For Selected Small-Scale CDM Project Activity Categories

Technology for project activity:

The class S-88 is an indigenous technology & does not involve any technology transfer. It is designed for a medium wind speed regime. Its wind turbine concept is based on a robust design with pitch regulated blade operation, a 3-stage gearbox with 2200 kW rating and flexible coupling to the asynchronous induction generator. The Suzlon flexi-slip system provides efficient control of the load and power control and the turbine operation is efficiently controlled by the Suzlon controller. These technologies are all well-known in the wind power industry and have proven themselves over time. The S 88-2.1 MW is designed to withstand extreme conditions and operate effectively with lower maintenance cost.

The project activity is a clean source of power generation. The environmental aspects in consideration are as follows:

- In comparison to other sources of power generation prevailing in the project grid region, wind power is one of the cleanest power generation modes
- Project activity does not involve release pollutants in air, water or soil
- As compared to other power plants, less amount of land is required for wind power generation
- No or less biodiversity loss which may occur in some other power plants like hydro
- Less noise pollution
- Conservation of conventional fuels

The electricity generation is the result of the utilization of kinetic energy in wind to drive the wind turbine blades to generate electricity. Thus the operation of the wind power project is considered as environmentally safe and benign to environment as compared to conventional power generation.

Moreover, currently Suzlon technologies like 0.6 MW (S-52), 1.25 MW (S-66), 1.5 MW (S-82) is mostly adopted by many PPs. CJP has considered the latest technology of 2.10 MW (S-88) from Suzlon due to following advantages:

- Single largest capacity in the country among all the technology suppliers
- Highest Swept Area of 6082 m^2
- Robust design

Technical specification for Class: S-88[5]

[3] http://cdm.unfccc.int/UserManagement/FileStorage/SJI52M6QXGKFNOZABTHDYPU789EV3C
[4] http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid06.pdf
[5] http://www.suzlon.com/pdf/S88%20product%20brochure.pdf

Rotor	
Diameter	88m
No. of rotor blade	3
Rotor blade material	Fiberglas/Epoxy
Swept area	6082m^2
Hub height	79m

Operational data	
Cut in wind speed	4m/s
Rated wind speed	14m/s
Cut off wind speed	25m/s

Gear box	
Type	3 stage 1 planetary & 2 helical
Gear ratio	1:98.8 / 1:118.1
Nominal load	3 stage 1 planetary & 2 helical

Generator	
Type	Asynchronous 4 poles with slip ring
Rotational speed	15 – 17.6 RPM
Rated output	2100 kW
Rated voltage	690 / 600 V
Frequency	50 /60 Hz
Insulation	Class H
Cooling system	Air cooled

Yaw drive	
Method of operation	3 electrical driven planetary drives
Bearing type	Polyamide slide bearing

Safety systems	
Aerodynamic Brake system	3 independent systems with blade pitching
Mechanical Brake system	Hydraulic fail-safe disc brake system

Tower	
Type	Tubular in 4 sections

Other Features	
Operational lifetime of WTG[6]	20 years

Power curve for 2.10 MW WTG[7]:

[6] Page 18 of the *Technical Specification document of S-88* provided by Suzlon

[7] http://www.suzlon.com/pdf/S88%20product%20brochure.pdf

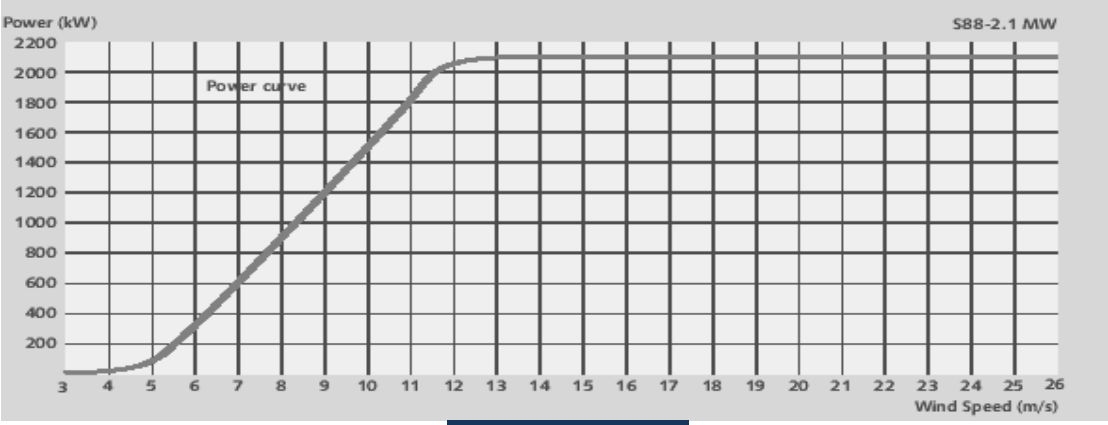

Figure 02: Power Curve

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

The PP has chosen fixed crediting period of 10 years. It is estimated that the project activity would generate 34,450 tonnes of CO_2 e during the crediting period. Annual estimates of emission reductions by the project activity during the above crediting period are furnished below.

Years	Estimation of annual emission reductions in tonnes of CO_2 e
2011-12	3,445
2012-13	3,445
2013-14	3,445
2014-15	3,445
2015-16	3,445
2016-17	3,445
2017-18	3,445
2018-19	3,445
2019-20	3,445
2020-21	3,445
Total estimated reductions (tonnes of CO_2 e)	34,450
Total number of crediting years	10
Annual average of the estimated reductions over the crediting period (tCO_2 e)	3,445

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

The project activity is not availing any public funding. Kindly refer Annex 2.

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

As per "*Guidelines on Assessment of De-bundling for SSC Project Activities*" (Version- 03, EB- 54, Annex- 13)[8]:

[8] http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid17.pdf

Debundling is defined as the fragmentation of a large project activity into smaller parts. A small-scale project activity that is part of a large project activity is not eligible to use the simplified modalities and procedures for small-scale CDM project activities. The full project activity or any component of the full project activity shall follow the regular CDM modalities and procedures.

This wind power project activity is a separate project activity having installed capacity of 2.10 MW (2.10 MW × 1 No.) and is not a de-bundled component of any large scale project activity.

A proposed small-scale project activity shall be deemed to be a de-bundled component of a large 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/measure; and*
- *Registered within the previous 2 years; and*
- *Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point.*

This is second CDM wind power project activity for CJP. The first CDM project has been registered at UNFCCC (Ref.: No.: 3550) on 16/09/2010, which is located at Taluka: Sinnar, District: Nasik, State: Maharashtra (India).

So the project cannot be deemed to be a de-bundled 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:

The approved baseline and monitoring methodology for small scale project activity, *Grid connected renewable electricity generation (AMS- I.D.*[9] *Version- 16, EB- 54),* has been applied to this wind power project activity. The title and reference of the approved baseline and monitoring methodology applied to the small-scale project activity is as below –

Title of Methodology : *Grid connected renewable electricity generation* ---Version 16
Reference : AMS- I.D.

Tools referred to design Project baseline & additionality:

- *Tool to calculate the emission factor for an electricity system (Version- 02, EB- 50)*[10]
- *Attachment A to Appendix B, Version 06: 30/09/2005*[11]
- *Tool for the demonstration and assessment of additionality (Version: 05.2, EB: 39)*[12]
- *Guidelines on the Assessment of Investment Analysis (Version- 03.1, Annex- 58, EB- 51)*[13]

[9] http://cdm.unfccc.int/UserManagement/FileStorage/SJI52M6QXGKFNOZABTHDYPU789EV3C
[10] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.pdf
[11] http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid05.pdf
[12] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v5.2.pdf
[13] http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03.pdf

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

Approved small-scale baseline methodology, *AMS- I.D. (Version- 16, EB- 54)*, is applicable for this project activity. As per section 'Technology/measure' of the approved small-scale baseline methodology —

Sr. No.	Applicability conditions	Justification
1.	*This category comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that supply electricity to a national or a regional grid. Project activities that displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit shall apply AMS I.F.*	The project activity is wind based power generation located in the State of Rajasthan and is supplying electricity to the NEWNE Grid.
2.	*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 a Greenfield plant (option a).
3.	*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 as it is a wind power generation.
4.	*In the case of biomass power plants, no other biomass types than renewable biomass are to be used in the project plant.*	Not applicable as it is wind based power generation project.
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.*	The project activity only comprises of renewable component (i.e. Wind). The total capacity of the project activity is 2.10 MW (2.10 MW × 1 No.) which is less than the small-scale capacity limit of 15 MW.

6.	*Combined heat and power (co-generation) systems are not eligible under this category.*	Not applicable as it is a wind based power generation 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 as it does not involves addition of renewable power generation facility.
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, as it is a Greenfield project activity.

The total capacity of the project activity, 2.10 MW, is well below the limit of 15 MW which is the eligibility limit for a small-scale CDM project activity. During the entire crediting period the total capacity of the project activity will not change. The project activity thus complies with the requisite criteria for AMS- I.D. (Version-16, EB-54).

B.3 Description of the project boundary:

As per paragraph 9 of the approved baseline methodology, *AMS- I.D. (Version-16, EB-54)* for small scale project activity, –*'The physical, geographical site of the renewable generation source delineates the project boundary.'*

The project activity falls under NEWNE Grid. The project boundary consists of the WTG, the metering point at Ketu Kalan Substation, Bulk metering point at Tinwari sub station.

The schematic diagram of project boundary is as under:

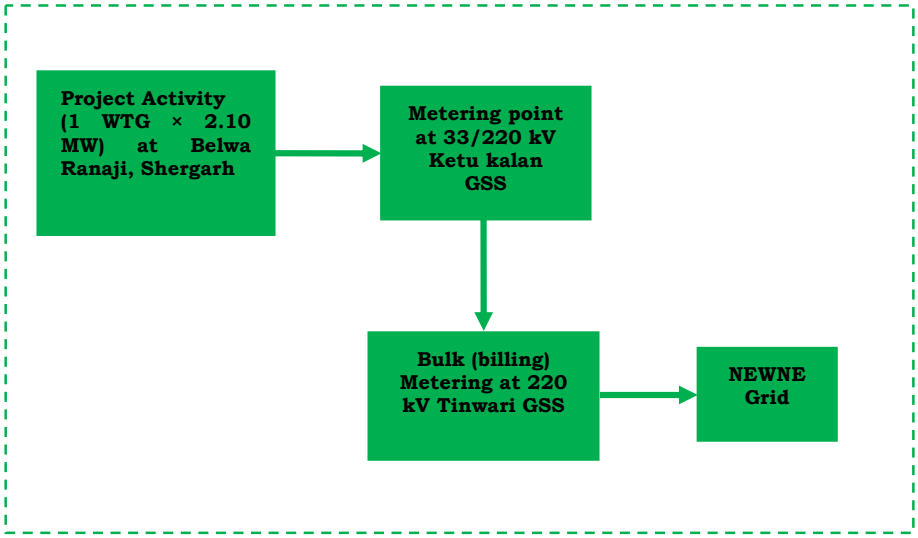

Figure 03: Project Boundary

The sources and gases in the project boundary are as follows:

Source	Gas	Included?	Justification / Explanation

Baseline	Fossil fuel based thermal power plants in the grid region	CO_2	Yes	The NEWNE grid is mostly dominated by grid connected fossil-fuel based power plants.
		CH_4	No	Excluded for simplification. This is conservative.
		N_2O	No	Excluded for simplification. This is conservative.
Project Activity	Not applicable for wind power project	CO_2	No	Not applicable for wind power project
		CH_4	No	Not applicable for wind projects
		N_2O	No	Not applicable for wind projects

B.4 Description of baseline and its development:

As per AMS- I.D. (Version- 16, EB- 54), paragraph 10:

'If the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the electricity delivered to the grid by the project activity that otherwise would have been generated by the operation of grid-connected power plants and by the addition of new generation sources.'

Since the project activity is a new grid-connected power plant, the above stated baseline is applicable for the project. Further, as per paragraph 11:

'*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)

Further as per paragraph 12 of the methodology,

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

The project proponent has opted for approach 'a' i.e. combined margin emission factor with ex-ante approach where emission factor is fixed for the whole crediting period. The ex ante approach is considered conservative since the grid system in future is expected to become more carbon intensive as the projects planned to establish in the region is mostly from thermal power sector.

Following information is used for baseline development:

1. Net electricity delivered to the Grid ($EG_{BL,y}$, kWh) by the project activity per annum taken from the monthly *Break up of Net Export Units report* by Developer and monthly invoices of sell to JdVVNL (Jodhpur Vidyut Vitran Nigam Limited).
2. The grid emission factor (tCO_2/MWh) from CEA Database, Version 5.0 published by Central Electricity Authority (CEA), Government of India.

Sr. No.	Parameters	Unit	Value	Reference
1	$EF_{grid\ BM,y,}$	tCO_2/MWh	0.675[14]	CEA Database, version 5.0[15]
2	$EF_{grid,OM,y}$	tCO_2/MWh	1.004	CEA Database, version 5.0
3	$EF_{grid,CM,y}$	tCO_2/MWh	0.921	Calculated as per equation 14 of Methodological tool *"Tool to calculate the emission factor for an electricity system"* (Version- 02, Annex 14, EB-50)

The calculation of the grid emission factor using the Combined Margin methodology has been detailed under Section B.6.1.

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:

The project activity is additional as per the options provided under '*Attachment A to Appendix B'* of the simplified modalities and procedures for small-scale CDM project activity.

The project additionality as per the *Attachment A to Appendix B* is given below:

Attachment A to Appendix B

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

a. Investment barrier
b. Technological barrier
c. Barrier due to prevailing practice
d. Other barriers

PP has chosen *Investment barrier* to prove project additionality.

[14]The original value (i.e 0.675181027884444) as per CEA CO_2 database is rounded-down to 3 decimals as a conservative approach.
[15] Baseline Carbon Dioxide Emission Database , CEA, Version: 05, http://www.cea.nic.in/planning/c%20and%20e/database_publishing_ver5.zip

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

Investment Analysis:

The investment analysis for this project activity is done as per the Methodological Tool –"*Tool for the demonstration and assessment of additionality", (Version- 05.2, Annex- 10, EB- 39).*

Suitability equity IRR for the project activity:

The *"Tool for the demonstration and assessment of additionality", (Version- 05.2, Annex- 10, EB- 39)* requires the PP to identify the financial indicator, such as IRR, NPV, cost benefit ratio, or unit cost of service (e.g. levelized cost of electricity production in INR/kWh or levelized cost of delivered heat in INR/GJ) most suitable for the project type and decision-making context. The project developer has chosen Equity IRR to demonstrate the additionality of the project. The *"Tool for the demonstration and assessment of additionality", (Version- 05.2, Annex- 10, EB- 39)* permits the use of equity IRR, for demonstrating the additionality using benchmark analysis. The tool permits the use of either project IRR or equity IRR. The project is funded through own funds of PP, hence the Project IRR and Equity IRR for the project will be same. Since the project developer is demonstrating the financial unattractiveness of the project and that the project is financed by 100% equity, equity IRR has been considered appropriate.

Benchmark:

As per Paragraph (6) of sub-step 2 (b) of "*Tool for the demonstration and assessment of additionality", (Version- 05.2, Annex- 10, EB- 39)*, discount rates or benchmark shall be derived from:

(a) 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;

(b) Estimates of the cost of financing and required return on capital (e.g. commercial lending rates and guarantees required for the country and the type of project activity concerned), based on bankers views and private equity investors/funds' required return on comparable projects;

(c) A company internal benchmark (weighted average capital cost of the company) only in the particular case referred to above in paragraph 5. The project developers shall demonstrate that this benchmark has been consistently used in the past i.e. that project activities under similar conditions developed by the same company used the same benchmark;

(d) Government/official approved benchmark where such benchmarks are used for investment decisions;

(e) Any other indicators, if the project promoters can demonstrate that the above Options are not applicable and their indicator is appropriately justified.

PP has considered the point (a) to derive the benchmark by using various sources of information relating to items.

As per "*Tool for the demonstration and assessment of additionality", (Version: 05.2, EB 39, Annex 10),* when applying Option III, the financial/economic analysis shall be based on parameters that are standard in the market, considering the specific characteristics of the project type, but not linked to the subjective profitability expectation or risk profile of a particular project developer.

Hence, PP has considered Return on Equity calculated under CAPM model as appropriate benchmark for investment analysis.

Cost of Equity: The cost of equity has been determined based upon the Capital Asset Pricing Model (CAPM)

CAPM: The Capital Asset Pricing Model (CAPM) is used to determine a theoretically appropriate required rate of return of an asset. The model takes into account the asset's sensitivity to non-diversifiable risk (also known as market risk), often represented by the quantity beta (β) in the financial industry, as well as the expected return of the market and the expected return of a theoretical risk-free asset.

The underlying algorithm of CAPM is as follows

$$R_e = R_f + \beta\ (R_m - R_f)$$

Where,

R_e = Expected return from a security
R_f = Rate of a risk free investment
R_m = Expected market return
β = Indicator towards measuring the volatility of the security, relative to the asset class.

It is apparent from the above equation that the expected return from a security is the return of a risk-free investment plus Beta times the difference between the expected market return and the return from the risk-free investment (termed as market risk premium). Hence CAPM justifies that the expected return of an investor should be commensurate with the higher expected risk of the investment.

In words, the algorithm says expected Return from a security = Risk free return + Market risk Premium * Beta

Thus, in order to apply CAPM, the following estimates are required

- Risk Free rate
- Market Risk Premium
- Beta

Risk Free Rate (R_f):

The risk free return on a security, that is free from default risk and is uncorrelated with returns from anything else in the economy. PP has considered weighted average return of Securities having maturity of more than 10 years for the financial year 2008-09 as risk free rate. The weighted average return as on 31/08/2009 was 7.69%. It can be referred at: http://rbidocs.rbi.org.in/rdocs/AnnualReport/PDFs/11PDM080809.pdf.

Market Return (R_m):

PP has calculated Market Return on the basis of return of BSE-500.

Suitability of BSE- 500: BSE-500 index consist 500 scripts. The changing pattern of the economy and that of the market were kept in mind while constructing this index. BSE-500 index represents nearly 93% of the total market capitalization on BSE. BSE-500 covers all 20 major industries of the economy.

Beta (β):

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 (β_e) = Covariance (r, rm) / Variance (rm)

Where:

r = return from the portfolio created by the PP
rm = return from the equity investment in the well-diversified market portfolio

On the basis of above lowest βe comes to 0.60 as on 31/08/2009 (detail calculation is attached for reference)

Based on above the values cost of equity for period is calculated as under:

R_f: 7.69% (Wt. Average yield of Govt. Securities 2008-09)
R_m: 18.53% (calculation sheet is attached for reference)
β: 0.60 (calculation *sheet is attached for reference)*

Hence, cost of equity comes to

R_e = 7.69% + 0.60*(18.53% – 7.69%)
R_e = 14.14%

Calculation and comparison of financial indicators:

The financial indicator – equity IRR was computed for a period of 20 years, corresponding to the lifetime a wind power project. The values are considered from the purchase order, which is the Investment decision date of the project. The following assumptions have been used for deriving the IRR.

Sr. No.	Parameter	Unit	Value	Reference
1.	Total Installed Capacity	MW	2.1	Proposal from Supplier
2.	No. of turbines	Nos.	01	Proposal from Supplier
3.	Total capacity	MW	2.1	Proposal from Supplier

4.	Plant load factor	Percent	20.44%[16]	PLF Report Prepared by MITCON
5.	Net annual generation	Million kWh	3.760	Calculated
6.	Selling rate considered	INR/kWh	4.28	Rajasthan Electricity Regulatory Commission order July 2009
7.	CERs per annum	t CO_2	3462	Calculated
8.	Rate per CER considered[17]	Euro	13	Refer footnote
9.	Exchange rate per Euro[18]	INR	70	Refer footnote
10.	CER sale value per annum	INR in Million	3.150	Calculated
11.	Insurance per annum	INR in Million	0.172	Sheet no. 31 under Risk code 70 , Rate code 05 of http://www.tac.org.in/ziptariffs/aiftzip.zip
12.	O & M charges	INR in Million	2.10	Proposal from Supplier
13.	O & M from which year is applicable	Year	2nd	Proposal from Supplier
14.	Escalation in the O & M expenses	Percent	5.00	Proposal from Supplier
15.	Deration in energy in 6th , 10th , 14th , 18th , year	Percent	1.25	Rajasthan Electricity Regulatory Commission order September 2006
16.	Total cost of WEG (Project Cost)	INR in Million	114.50	Proposal from Supplier
17.	Equity	INR in Million	114.50	Promoter Decision

On the basis of above assumption IRR for the project activity without CDM benefits was found to be 9.20% which is lower than the benchmark rate of 14.14%.

The foregoing data proves that the project is not financially attractive and is additional. However, the robustness of this conclusion was tested by subjecting critical parameters to reasonable variation as required under *Guidance on the Assessment of Investment Analysis* (EB 51, Annex 58, Version 03.1). The results of the sensitivity analysis are given below:

Sub-step 2d. Sensitivity analysis

The *Guidance on the Assessment of Investment Analysis* (EB 51, Annex 58, Version 03.1), paragraph 17, states that *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.*

As per paragraph 18 of the same document:

[16]PP has maintained PLF value as 20.44% as per the first PLF report dated 14/09/2009 by M/s MITCON Consultancy Services Ltd. as compared to the 2nd PLF report value (20.34%) prepared by independent third party (M/s Madhav Consultants), confirming conservativeness of calculation.

[17] https://www.theice.com/marketdata/reports/ReportCenter.shtml?reportId=10&contractKey=81

[18] http://www.x-rates.com/cgi-bin/hlookup.cgi

"*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 different parameters that affect the viability of a wind power project are mentioned below:

Parameters	Comments
Electricity Generation	*This is the most important and critical parameter for any Power Project & hence viability of the project will be affected by any fluctuation in this parameter. Sensitivity analysis has therefore been carried out for it.*
Project Cost	*Sensitivity analysis has also been carried for this parameter, the cost consider for investment analysis is taken from the proposal forwarded by the WTG manufacturer, hence sensitivity analysis is carried out.*
O & M Cost	*This does not add to 20% of either total project cost or total project revenues, even than sensitivity analysis has been carried out for this parameter.*
Tariff Rate (Income from sale of electricity)	*The parameter is dependent on two factors; generation and tariff rate. Sensitivity analysis for generation has already been carried out.* *For tariff rate, the Project Promoter was aware of it because it is mentioned in the Rajasthan Electricity Regulatory Commission Order dated 16/07/2009 and it is fixed for a period of 20 years. Hence this parameter has not been subjected to sensitivity analysis.*

The sensitivity analysis results are as follows:

Project IRR					
Variation by	-10%	-5%	0%	5%	10%
Sensitivity based on Generation	7.48%	8.36%	9.20%	10.02%	10.81%
Sensitivity based on Project Cost	10.70%	9.92%	9.20%	8.54%	7.92%
Sensitivity based on Operation and Maintenance Cost	9.48%	9.34%	9.20%	9.07%	8.93%

It can be seen from the above that with a 10% increase in generation for 20 consecutive years, decrease in project cost by 10% or decrease in Operation and Maintenance by 10%, the IRR of the project is not crossing the benchmark selected for the project.

The project activity is clearly unattractive in the absence of CDM revenue. The promoter was aware of this fact and had considered this investment only in light of carbon credits benefit being available for this project.

The above paragraphs explain adequately that the project activity was not a business as usual case for the project proponent. The CDM revenue will help the project activity to cross the benchmark settled for the project. The IRR for the project with CDM income comes to 11.56%. So the CDM income will help to alleviate some of the financial risk associated with the project.

Hence, the project activity is additional.

CDM Consideration:

As per the *Guidance on the Demonstration and Assessment of Prior Consideration of the CDM (Version: 03, Annexure: 22, EB: 49, Section B- New project activities, Paragraph- 2)*[19] –

'The Board decided that for project activities with a starting date on or after 02 August 2008, the project participant must inform a Host Party DNA and the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status. Such notification must be made within six months of the project activity start date and shall contain the precise geographical location and a brief description of the proposed project activity, using the standardized form F-CDM Prior Consideration. Such notification is not necessary if a PDD has been published for global stakeholder consultation or a new methodology proposed to the Executive Board for the specific project before the project activity start date.'

The start date of the project activity is 23/10/2009 (Purchase orders to Suzlon Energy Limited & Suzlon Infrastructure Services Limited). As the project start date is after August 02, 2008, the project activity considered as *New Project Activity*.

The PP has intimated to UNFCCC and National CDM Authority (NCDMA) /Ministry of Environment & Forest (MoEF), India (DNA) about commencement of the project activity and of PP's intention to seek CDM status for the same respectively on 02/11/2010[20] & 07/04/2010[21].

Project Chronology:

Sr. No.	Activity/actions	Schedule/period of activity (DD/MM/YYYY)	Details
1.	Initial Offer by Suzlon for RKB Rajasthan[22]	01/09/2009	Suzlon submitted initial offer to CJP
2.	Work order to MITCON for Site Wind Potential Assessment	07/09/2009	CJP appointed MITCON Consultancy Services Ltd. to undertake assessment of wind potential of project activity.
3.	Report on assessment of wind energy potential for project activity	14/09/2009	MITCON Consultancy Services Ltd. conducted the assessment of wind energy potential at RKB-24 and submitted their report[23] to CJP.
4.	Investment Decision[24]	17/09/2009	Partners meeting at CJP Corporate house at Nadiad, Gujarat.
5.	Appointment of CDM consultant[25]	22/09/2009	CJP placed work order for consultancy services to MITCON Consultancy Services Ltd.
6.	Purchase orders to Suzlon Energy Limited	23/10/2009	CJP placed purchase order for 1 No. × 2.10 MW wind turbines to Suzlon Energy Limited &

[19] http://cdm.unfccc.int/EB/049/eb49_repan22.pdf
[20] Emails from CJP to both UNFCCC & MoEF (DNA)
[21] Email from CJP to National CDM Authority
[22] Email from Suzlon to CJP
[23] *Energy Estimation Study For Wind Turbine Generator In Rajasthan* dated 14/09/2009
[24] Partners Meeting Note dated 17/09/2009
[25] Work Order to MITCON Consultancy Services Ltd.

	& Suzlon Infrastructure Services Limited[26]		Suzlon Infrastructure Services Limited
7.	Intimation to UNFCCC	02/11/2009	CJP intimated the UNFCCC regarding their intentions to avail CDM benefits to the project activity.
8.	Stake holder consultation meeting	08/01/2010	CJP conducted stake holder meeting at the project site in co-ordination with Suzlon Energy Limited.
9.	Appointment of DoE	21/01/2010	CJP appointed RINA S.p.A. as their validator for the project activity.
10.	Commissioning of project activity[27]	27/02/2010	The Project activity, RKB-24, commissioned on 27/02/2010.
11.	Intimation to National CDM Authority, Government of India	07/04/2010	CJP intimated the NCDMA regarding their intentions to avail CDM benefits to the project activity.
12.	PLF Report By M/s Madhav Consultants	15/11/2010	The report has been prepared after raising a clarification by the validation team on previous PLF assessment report prepared by MITCON.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

Baseline Emissions:

Baseline methodology for project category I.D. has been detailed in paragraphs 10-18 of the approved small scale methodology AMS I.D. (Version- 16, EB- 54). As per paragraph 10,

'*If the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the electricity delivered to the grid by the project activity that otherwise would have been generated by the operation of grid-connected power plants and by the addition of new generation sources.*'

Since the project activity is a new power plant, the above stated baseline is applicable for the project. Further, as per paragraph 11….

'*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)

[26] Project activity start date
[27] Commissioning certificate dated 16/03/2010 issued by RDPPC, Jodhpur Discom

Further, as per paragraph 12,

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

The emission factor has been estimated using option (a) above by using the following seven steps of *"Tool to calculate the emission factor for an electricity system" (Version- 02,* Annex 14, *EB- 50):*

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 below:

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
Utter Pradesh	-	-	Tripura	-

As the project activity is located in the State of Rajasthan, NEWNE Grid is the identified relevant electricity system.

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

PP has 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 very enough stable 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 currently be applied in India due to lack of necessary data.

As per emission factor tool, 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.

In India as per available data with CEA, the low-cost/must-run resources constitutes 19.62 % (Average of most recent 5 years) which is less than 50% of total grid generation.

NEWNE Grid: Share of low cost / Must- run (% of net generation)					
Year	**2004-05[28]**	**2005-06[29]**	**2006-07**	**2007-08**	**2008-09**
Share of low cost / Must-run (% of net generation)	25.40%	17.95%	18.46%	19.04%	17.26%
Average of most recent 5 years	19.62%				
Table reference- CO_2 Baseline Database (Version: 5 , November 2009): http://www.cea.nic.in/planning/c%20and%20e/database_publishing_ver5.zip					

The emission factor has been calculated by using the *ex ante* option. As the *ex ante* option has been chosen, the emission factor has been determined once at the validation stage, thus no monitoring and recalculation of the emissions factor will be required during the crediting period.

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

The simple OM may be calculated:

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.

[28] Source: CEA Baseline Database (Version- 03)
[29] From year 2005-06 onwards CEA Baseline Database (Version- 05) has been referred.

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 Step2).

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:

$$EF_{grid,OMsimple,y} = \frac{\sum_i \left(FC_{i,y} \times NCV_{i,y} \times EF_{CO2,i,y}\right)}{EG_y}$$

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"*. The value of operating margin emission factor is 1.004 tCO_2 /MWh.

NEWNE Grid: Simple Operating Margin (tCO2/MWh) (incl. Imports)				**Average OM**
Year	**2006-07**	**2007-08**	**2008-09**	**-**
Simple Operating Margin (tCO2/MWh) (incl. Imports)	1.008	0.999	1.006	1.004

Table reference- CO_2 Baseline Database (Version: 5 , November 2009): http://www.cea.nic.in/planning/c%20and%20e/database_publishing_ver5.zip

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: Identify the group of power units to be included in the build margin

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

(a) The set of five power units that have been built most recently; or
(b) The set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently. Project participants should use the set of power units that comprises the larger annual generation.

As a general guidance, a power unit is considered to have been built at the date when it started to supply electricity to the grid. Power plant registered as CDM project activities should be **e**xcluded from the sample group *m*. However, If the group of power units, not registered as CDM project activity, identified for estimating the build margin emission factor includes power unit(s) that is (are) built more than 10 years ago then:

The build margin reflects the average CO_2 intensity of newly built power stations that will be (partially) replaced by a CDM project. In accordance with the"*Tool to calculate the emission factor for an electricity system*" (Version- 02, Annex 14, EB- 50), the build margin is calculated as the average emissions intensity of the 20 % most recent capacity additions in the grid based on net generation. Depending on the region, the build margin covers units commissioned in the last five to ten years.

20% of Net Generation (GWh)

Year	**2005-06**	**2006-07**	**2007-08**	**2008-09**
20% of Net Generation (GWh)	87,575	93,072	99,224	101,955
Table reference- CO_2 Baseline Database (Version: 5 , November 2009):http://www.cea.nic.in/planning/c%20and%20e/database_publishing_ver5.zip				

Net Generation in Built Margin (GWh)

Year	**2005-06**	**2006-07**	**2007-08**	**2008-09**
Net Generation in Built Margin (GWh)	87, 764	93, 524	100, 707	102,589
Table reference- CO_2 Baseline Database (Version: 5 , November 2009): http://www.cea.nic.in/planning/c%20and%20e/database_publishing_ver5.zip				

Furthermore, as per the "*Tool to calculate the emission factor for an electricity system*" (Version- 02, Annex 14, EB- 50), if a station/power plant is registered as a CDM activity, it is excluded from the build margin but not from the operating margin.

Step 6: Calculate the build margin emission factor

As per the "Tool to calculate the emission factor for an electricity system" (Version- 02, Annex 14, EB- 50), the build margin emissions factor is the generation-weighted average emission factor

(tCO2/MWh) of all power units m during the most recent year y for which power generation data is available, calculated as follows:

$$EF_{grid,BM,y} = \frac{\sum_{m} EG_{m,y} \times EF_{EL,m,y}}{\sum_{m} EG_{m,y}}$$

Where:

$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year *y* (tCO_2/MWh)

$EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit *m* in year *y* (MWh)

$EF_{EL,m,y}$ = CO_2 emission factor of power unit *m* in year *y* (tCO_2/MWh)

m = Power units included in the build margin

y = Most recent historical year for which power generation data is available

BM values have been referred from CEA Database which has referred the "*Tool to calculate the emission factor for an electricity system*". The value of build margin emission factor is 0.675 tCO_2 /MWh.

NEWNE Grid: Build Margin (tCO_2/MWh) (not adjusted for imports)				
Year	**2005-06**	**2006-07**	**2007-08**	**2008-09**
Build Margin (tCO_2/MWh) (not adjusted for imports)	0.67	0.63	0.60	0.675
Table reference- CO_2 Baseline Database (Version: 5 , November 2009): http://www.cea.nic.in/planning/c%20and%20e/database_publishing_ver5.zip				

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

Step 7: Calculate the combined margin emissions factor

The combined margin is a weighted average of the simple operating margin and the build margin. By default, both margins have equal weights (50%). In particular, for intermittent and non-dispatchable generation types such as wind and solar photovoltaic, the "Tool to calculate the emission factor for an electricity system" (Version- 02, Annex 14, EB- 50) allows to weigh the operating margin and build margin at 75% and 25%, respectively.

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

Where:

$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year y (tCO_2/MWh)

$EF_{grid,OM,y}$ = Operating margin CO_2 emission factor in year y (tCO_2/MWh)

W_{OM} = Weighting of operating margin emissions factor (%)

W_{BM} = Weighting of build margin emissions factor (%)

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

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

= $0.75 \times 1.004 + 0.25 \times 0.675$

= $0.921\ tCO_2/MWh$

Further, multiplication of Energy baseline ($EG_{BL,y}$) in MWh with CO_2 Emission Factor (EF_{CO2}) in tCO_2e/MWh will give the estimated value of Baseline Emissions tCO_2 (BE_y). Thus,

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

= 3741×0.921

= $3{,}445\ tCO_2$

Thus estimated baseline emissions (BE_y) for the project activity shall be 3,445 tCO_2 per annum.

Project Emissions (PE_y):

As per paragraph 19 of approved methodology AMS-I.D. (Version- 16, EB- 54), *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 can be considered as zero.

Leakage Emissions (LE_y):

As per paragraph 20 of the approved methodology AMS- I.D. (Version- 16, EB- 54), *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 21 of AMS-I.D. (Version- 16, EB- 54).

$$ER_y = BE_y - PE_y - LE_y$$

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)

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

Data / Parameter:	$EF_{grid,OM,y}$
Data unit:	tCO_2/ MWh
Description:	CO_2 Operating Margin emission factor for the NEWNE Grid (Latest three years average-2006-07, 2007-08, 2008-09)
Source of data used:	CO_2 Baseline Database (Version: 5 , November 2009): http://www.cea.nic.in/planning/c%20and%20e/database_publishing_ver5.zip & CO_2 Baseline Database, User Guide (Version- 5, November 2009) httphttp://www.cea.nic.in/planning/c%20and%20e/user_guide_ver5.pdf
Value applied:	1.004 tCO_2 / MWh
Justification of the choice of data or description of measurement methods and procedures actually applied :	The Development of this CO_2 Database has been done under Indo-German Bi-lateral Technical Cooperation between the Governments of India and Germany jointly implemented by GTZ together with partners Central Electricity Authority and the Bureau of Energy Efficiency under the Ministry of Power.
Any comment:	This database is an official publication of Government of India for the purpose of CDM baselines. It is based on most recent data available to the Central Electricity Authority and hence considered authentic. As the calculation of baseline emission has been done *ex ante* its value will remain fixed for the entire crediting period.

Data / Parameter:	$EF_{grid, BM,y}$
Data unit:	tCO_2/ MWh
Description:	CO_2 Build Margin emission factor for the NEWNE Grid 2008-09
Source of data used:	CO_2 Baseline Database (Version: 5 , November 2009): http://www.cea.nic.in/planning/c%20and%20e/database_publishing_ver5.zip & CO_2 Baseline Database, User Guide (Version- 5, November 2009) httphttp://www.cea.nic.in/planning/c%20and%20e/user_guide_ver5.pdf
Value applied:	0.675 tCO_2 / MWh
Justification of the choice of data or description of measurement methods and	The Development of this CO_2 Database has been done under Indo-German Bi-lateral Technical Cooperation between the Governments of India and Germany jointly implemented by GTZ together with partners Central Electricity Authority and the Bureau of Energy Efficiency under the Ministry of Power.

procedures actually applied :	
Any comment:	This database is an official publication of Government of India for the purpose of CDM baselines. It is based on most recent data available to the Central Electricity Authority and hence considered authentic. As the calculation of baseline emission has been done *ex ante* its value will remain fixed for the entire crediting period

Data / Parameter:	$EF_{grid,CM,y}$
Data unit:	tCO_2 / MWh
Description:	$EF_{grid,CM,y}$ is the grid emission coefficient calculated in a transparent and conservative manner as Combined Margin (CM) which is the combination of Operation Margin (OM) and Build Margin (BM) (OM & BM have been calculated *ex-ante*) Grid emission factor calculation: $EF_{grid,CM,y} = 0.75 \times EF_{grid,OM,y} + 0.25 \times EF_{grid,BM,y}$ $= 0.75 \times 1.004 + 0.25 \times 0.675$ $= 0.921\ tCO_2/MWh$
Source of data used:	CO_2 Baseline Database (Version: 5 , November 2009): http://www.cea.nic.in/planning/c%20and%20e/database_publishing_ver5.zip & CO_2 Baseline Database, User Guide (Version- 5, November 2009) httphttp://www.cea.nic.in/planning/c%20and%20e/user_guide_ver5.pdf
Value applied:	$0.921\ tCO_2/MWh$
Justification of the choice of data or description of measurement methods and procedures actually applied :	The Development of this CO_2 Database has been done under Indo-German Bi-lateral Technical Cooperation between the Governments of India and Germany jointly implemented by GTZ together with partners Central Electricity Authority and the Bureau of Energy Efficiency under the Ministry of Power. The $EF_{grid,CM,y}$ calculation is based on the guidelines in "*Tool to calculate the emission factor for an electricity system*" (Version- 02, EB- 50)
Any comment:	The calculation is done *ex ante*.

B.6.3 Ex-ante calculation of emission reductions:

Ex-ante calculation of Emission Reductions (ER_y):

The Quantity of net electricity supplied to the grid in year y by the project activity per annum can be estimated as below:

Sr. No.	Project Parameters	Details
1	Site	Belwa Ranaji
2	Grid	NEWNE
3	WTG capacity	2.10 MW
4	Total no. of turbines	01
5	Plant Load Factor[30]	20.34%[31]

[30]PP has considered PLF value as 20.34% for baseline calculation as per the 2nd PLF report prepared by independent third party (M/s Madhav Consultants) to confirm the conservativeness of calculation.

6	Quantity of net electricity supplied to the grid in year y (Estimated)	3,741 MWh

Thus, the estimated Quantity of net electricity supplied to the grid in year y by the project activity will be 3,741 MWh per annum.

Baseline Emissions (BE_y), tCO_2:

$BE_y = EG_{BL,y} \times EF_{CO2,grid,y}$
$= 0.921 \times 3,741$
$= 3,445\ tCO_2$

Thus, the total estimated baseline emission (BE_y) by the project activity is 3,445 tonnes of carbon dioxide per annum.

Emission Reductions (ER_y):

The emission reductions (ER_y) are calculated as per paragraph 21 of AMS-I.D. (Version- 16, EB- 54).

$$ER_y = BE_y - PE_y - LE_y$$

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)

Project Emissions (PE_y):

As per paragraph 19 of approved methodology AMS-I.D. (Version- 16, EB- 54), *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 can be considered as zero.

[31] T & D losses are accounted in the PLF calculation in the third party PLF report so T & D losses are not considered separately.

Leakage Emissions (LE_y):

As per paragraph 20 of the approved methodology AMS- I.D. (Version- 16, EB- 54), *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.

The total emission reductions by the project activity may be calculated as:

As for wind power project activity the leakages & project emissions are considered as zero, the emission reductions of the project activity are equal to the baseline emissions. Thus,

$$ER_y = BE_y = 3{,}445\ tCO_2$$

Thus estimated emission reductions (ER_y) for the project activity shall be 3,445 tCO_2 per annum.

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

Year	Estimation of project activity emissions (tCO_2 e)	Estimation of baseline emissions (tCO_2 e)	Estimation of leakage (tCO_2 e)	Estimation of overall emission reductions (tCO_2 e)
2011-12	0	3,445	0	3,445
2012-13	0	3,445	0	3,445
2013-14	0	3,445	0	3,445
2014-15	0	3,445	0	3,445
2015-16	0	3,445	0	3,445
2016-17	0	3,445	0	3,445
2017-18	0	3,445	0	3,445
2018-19	0	3,445	0	3,445
2019-20	0	3,445	0	3,445
2020-21	0	3,445	0	3,445
Total (tonnes of CO_2 e)	**0**	**34,450**	**0**	**34,450**

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

B.7.1 Data and parameters monitored:

Data / Parameter:	$EG_{BL,y}$
Data unit:	kWh/y
Description:	Quantity of net electricity supplied to the grid in year y
Source of data to be used:	Monthly Joint Meter Readings Reports / *Monthly Break up of net export units report*/Monthly invoices of sell
Value of data	3,741,000
Description of measurement methods and procedures to be applied:	The electricity generated by the wind farm/WTG is first displayed on the in-built control WTG panel. WTG is connected to Suzlon CMS through SCADA. **Metering at Ketu Kalan 33 kV/220 kV GSS:**

	The electricity from the wind farm/WTGs is evacuated to the Suzlon pooling station at Ketu Kalan GSS. The project activity WTG along with other WTGs, are connected to the feeder wise metering points. The project metering is done at one of the metering points which consists of both main & check meter. The joint meter reading is taken on monthly basis by the representatives of PP & RVPNL/JdVVNL. It records parameters like export, import etc. All the feeder wise metering points of the wind farm are further connected to the bulk metering point at the state utility 220 kV GSS Tinwari. The electricity (export, import & net export) for the project activity is apportioned on the basis of generation ratio (Controller reading of WTG of PP/ Total controller reading for all WTGs) at the project metering point at Ketu Kalan GSS. **Metering at Tinwari 220 kV GSS:** The bulk meter at Tinwari records total electricity received from all connected metering points. The bulk meters consist of both main & check meters. The monthly JMR is taken by the representative of PP & State Utility. It records parameters like total export, total import etc. The total transmission loss occurred during export & import of electricity between the 33/220 kV level at Ketu Kalan GSS & 220 kV Tinwari GSS bulk metering point is calculated. The transmission loss occurred during export & import of electricity is further apportioned for each PP & is subtracted from the values of $EG_{Export, metering\ point}$ & $EG_{Import, metering\ point}$ to get net value of export & import. The net electricity delivered/supplied to the grid is obtained by subtracting net import from net export. Thus, Net electricity delivered to the Grid by the project activity in a given month = Export – Import The values of the net electricity delivered to the Grid by the project activity is aggregated annually to get the value of net electricity delivered to the Grid ($EG_{BL,y}$, kWh) by the project activity per annum. 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 (*ex ante* determined in tCO_2/MWh unit). **Details of Monitoring:** Metering: Trivector meter Accuracy class: 0.2s Data Type: Electricity Recording: Monthly Invoices/ Monthly *Break up of Net Export Units*

	report Archiving policy: Paper & Electronic Energy meter calibration frequency: Once annually as per PPA Responsibility: State Utility shall be responsible for regular calibration of the meters.
QA/QC procedures to be applied:	The meters shall be approved, tested & sealed by the RVPNL/JdVVNL. All meters are sealed and are in the custody of State Utility. The calibration of the meters will be carried out by PP/Developer or RVPNL/JdVVNL once annually. Other than periodic calibration of the meters, the reading of both meters will be matched every month. In case of failure of main meter during the monitoring the metering of the electricity will be done as per the Power Purchase Agreement.
Any comment:	Data will be archived for two years after the end of crediting period or of the last issuance of CERs for this project activity, whichever occurs later.

B.7.2 Description of the monitoring plan:

The monitoring of project activity is done as per approved small scale methodology AMS- I.D. (Version- 16, EB- 54). As per paragraph 22 of the approved methodology:

Relevant parameters shall be monitored as indicated in the table below.

Table 1: Parameters for monitoring during the crediting period.

No.	Parameter	Description	Unit	Monitoring/recording Frequency	Measurement Methods and Procedures
1.	$EG_{BL,y}$	Quantity of net electricity supplied to the grid in year y	kWh/y	Continuous monitoring, hourly measurement and monthly recording	Measurements are undertaken using energy meters. The calibration of the meters will be carried out annually. The net electricity export/supplied to a grid is the difference between the measured quantities of the grid electricity export and the import. The monthly electricity recorded by the project activity in *Monthly Break up of net export units report* will be cross checked with the Monthly invoices of sell.

Monitoring of the project activity:

The monitoring of the project activity is given as below:

- The primary monitoring is done at the individual WTG. The WTG is equipped with an integrated electronic controller, which displays generated electricity on the onboard screen. This controller is connected to the Central Monitoring Station (CMS) of Suzlon Energy Limited through SCADA. The generation data of individual machine can be monitored as a

real-time parameter at CMS. Furthermore, the WTG controller is a micro-processor based intelligent controller which has been specially designed for control of wind turbines & which is self calibrated. It uses a Woodward multi function relay that has three current inputs from CT and three direct voltage inputs (690 Volts). The analog values of current / voltage is converted into digital signal internally using A/D Converters at very high sampling rate. A software program reads these values and displays instantaneous parameters such as voltage, current, power factor, kVARh, and kWh. These instantaneous values are then time integrated and displayed / stored. Woodward relay is having no display and needs special protocol to view energy readings as this relay is communicating digital signal through special communication protocol hence, it is not possible to calibrate. In case of malfunctioning of the controller, the WTG is programmed for automatic shut-down. The probability of error in controller panel meter is negligible. This information at the CMS is further transmitted to Suzlon Head office via VSAT. The daily generation report is being sent to PP via email.

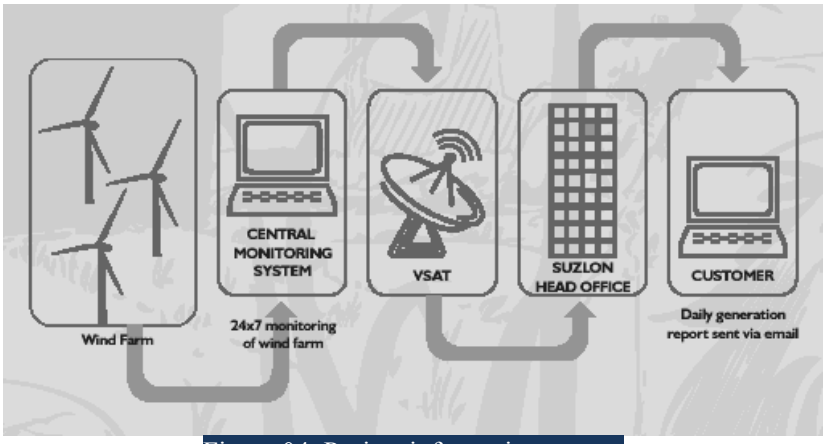

Figure 04: Project information system

- The recording of the electricity delivered to the project metering point at Ketu Kalan GSS is carried out jointly by the representative of PP & State Utility on monthly basis.
- All the feeder wise metering points of the wind farm are further connected to the Bulk meter at the state utility substation (GSS) at Tinwari.
- The bulk meter at Tinwari GSS records total electricity received from all connected metering points. The bulk meters consist of both main & check meters. The monthly JMR is taken by the representative of PP & State Utility on monthly basis. It records parameters like total export, total import etc.
- The meters shall be approved, tested & sealed by the RVPNL/JdVVNL. The meters are in the custody of RVPNL/JdVVNL. The calibration of the meters will be carried out by RVPNL/JdVVNL once annually. Other than periodic calibration of the meters, the reading of both meters is matched every month. In case of failure of main meter during the monitoring the metering of the electricity will be done as per the Power Purchase Agreement.
- Data will be archived for two years after the end of crediting period or of the last issuance of CERs for this project activity, whichever occurs later. The data will be archived in paper as well as in the electronic format.

Sample Apportioning Procedure:

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

Generation Ratio for metering point (Ketu Kalan GSS):

The generation ratio is the ratio of electricity generated by installed WTG of PP to the total generation by all the connected WTGs to the project metering point.

$$G_{R,\ metering\ point} = EG_{Controller,\ PP} \; EG_{Controller,\ metering\ point} \quad (a)$$

Calculation of electricity exported at project activity metering point:

The Main and Check meter at the project metering point displays number of parameters including export and import for all the connected WTGs.

The import, kWh for PP is calculated in the following manner:

$$EG_{Import,\ metering\ point} = G_{R,\ metering\ point} \times EG_{Total\ Import,\ metering\ point} \quad (b)$$

The export, kWh for PP is calculated in the following manner:

$$EG_{Export,\ metering\ point} = G_{R,\ metering\ point} \times EG_{Total\ Export,\ metering\ point} \quad (c)$$

The electricity exported at project activity metering point by the project activity is calculated by subtracting equation (b) from (a).

Thus,

The net electricity exported at project activity metering point

$$= EG_{Export,\ metering\ point} - EG_{Import,\ metering\ point} \quad (d)$$

Transmission Loss Calculation:

The total transmission loss occurred during export & import of the electricity is calculated between the 33/220 kV level at Ketu- Kalan & 220 kV level at Tinwari Bulk metering point.

The transmission loss during export & import is the difference between total aggregated reading of export, import for all metering points at 33/220 kV level and the total reading of export, import for same metering points recoded at the to 220 kV substation bulk meter.

The PP wise transmission loss during export & import is calculated by multiplying the values of arrived transmission loss for export & import for wind farm with the *Generation Ratio for wind farm.*

Generation Ratio for wind farm:

The generation ratio is the ratio of electricity generated by installed WTG of PP to the total generation by all the connected WTGs to the project metering point.

$$G_{R,\ wind\ farm} = EG_{Controller,\ PP} \; EG_{Controller,\ all\ metering\ points} \quad (e)$$

Calculation of Net electricity delivered to the Grid by the project activity:

The net values of export & import is obtained by subtracting the transmission loss during export & import for PP from $EG_{Export, metering\ point}$ & $EG_{Import, metering\ point}$ respectively.

The net electricity delivered to the Grid by the project activity in a given month (net export kWh) is obtained by subtracting net value of import from net values of export as obtained above. Thus,

Net electricity delivered to the Grid by the project activity in a given month

= Export – Import (f)

The sum of all these monthly net readings in a given year y will give $EG_{BL,y}$.

The apportioned values for the project activity can be referred from the *Monthly Break up of net export units report.*

O & M management structure:

Suzlon Energy Limited is providing O & M services to the project promoter. The O & M management structure is as follows:

Routine maintenance services:

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

- Tower torquing
- Blade cleaning
- Nacelle torquing and cleaning
- Transformer oil filtration
- Control panel & LT panel maintenance
- Site and transformer yard maintenance

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 in agreed format.
- 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

Emergency Preparedness Plan:

Project activity is having well design Onsite Emergency Plan (OEP). As per Onsite Emergency Plan (OEP) the identified emergencies are:

1. Fire / explosion at office, guest house, canteen and WTG panel
2. Emergency at height Fall
3. Calamities
4. Communicable diseases
5. Food poisoning
6. Snake Bite
7. Road Accident
8. Electrical short circuit at panel / HT Yard
9. Oil Spillage

Out of above emergencies Fire / explosion at office, guest house, canteen may cause unintended emissions during the project operations. This emergency is handled by O & M contractor as below:

1. On receiving information quickly rush to the emergency spot with fire extinguisher & operate the fire extinguisher to bring the fire under control.
2. If the fire is out of control inform Site/ Section in charge to inform fire brigade for further control & help.

Moreover, sudden mechanical failure of WTG including metering equipments may also occur during project operation this is tackled by the onsite O & M Team. The Central Monitoring Station (CMS) monitors the wind farm operations on continuous basis. After receiving the emergency/malfunction call from the Central Monitoring Station (CMS) the O & M team rush to the spot and cures the faults. The team is equipped with necessary skills & equipment to handle such situations. The fault in the metering system is determined by the State Utility/representative of PP (O & M contractor) during the regular inspection of the system or during the periodic testing or monthly meter reading matching. The malfunctioning of the electrical and metering system is tackled by PP & the State Utilities (RVPNL/JdVVNL) as per the Power Purchase Agreement.

Training needs:

CJP has appointed Suzlon Energy Limited as the Operation & Maintenance contractor for this project activity. Suzlon Energy Limited is well known for its well managed wind project operations in wind power industry throughout the world. It is an ISO certified company. The training activity to the employees is an integral part of the ISO system. It has trained its man power to carry out day to-day activity at the project site. It provides regular training to its employees. The training to the employees working at the project site involves following areas.

- Operation & maintenance
- Trouble shootings
- Preventive maintenance
- Safety techniques
- Onsite Emergency Plan (OEP)

The O & M contractor is well equipped with standard equipments to carry out necessary O & M operations.

Project Monitoring Team:

Sr. No.	Monitoring Team	Responsibility
1	Project Head (CJP)	• Overall performance monitoring • Project execution • Monthly review of project operations
2	Project Coordinator (CJP)	• Data Archival • Site visit for actual project monitoring Storage of data • Coordination with O & M Contractor for day to-day operations • Invoice preparation & follow ups • Coordination with Suzlon for regular calibration of meters • Reporting to Project Head • Online project monitoring • Feedback and corrective action wherever necessary • Follow up of project operation as per PPA.
3	O & M Contractor (Suzlon)	
3.1	Suzlon Mumbai Office	• Focal point between PP and O & M team at project site • Daily Generation Report to PP • Storage of data • Coordinating with PP/Consultant/Auditors during their site visit for validation/annual verification • Coordinating with state utility for monthly JMR reports • Complying as per O & M Agreement with the PP • Requesting/coordinating state utility for annual calibration behalf of PP
3.2	Project Site Team	• Day-to-day operation and maintenance • Data monitoring & recording • Storage of data • Monthly Joint meter reading with state utility • Maintenance of monitoring equipment and installations • Day-to-day records handling Monitoring, measurement and reporting, calibration of monitoring equipment • Handling of emergency situations, monitoring data adjustments & uncertainties, review of reports/data etc • Monitoring of project activity through facility at CMS, site visits

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

Date of completion of the application of the baseline and monitoring methodology: 07/04/2010

Name of person/entity determining the baseline: M/s Chhotabhai Jethabhai Patel & Co. (CJP), Nadiad, Gujrat, India and their consultant and M/s MITCON Consultancy Services Ltd., Pune, India.

Note: M/s Chhotabhai Jethabhai Patel & Co. (CJP), Nadiad, Gujarat, India is the project participant listed in Annex 1. M/s MITCON Consultancy Services Ltd., Pune, India is not the project participant in the project activity.

M/s Chhotabhai Jethabhai Patel & Co.:

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SECTION C. Duration of the project activity / crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

The project starting date is 23/10/2009 (Purchase orders to Suzlon Energy Limited & Suzlon Infrastructure Services Limited)

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

20 years & 0 months

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

The project activity has chosen *fixed* crediting period.

C.2.1 Renewable crediting period

Not applicable.

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:

The project activity has chosen *fixed* crediting period.

C.2.2.1	Starting date:

The starting date of the crediting period shall be 01/04/2011 or date not earlier than the date of registration.

C.2.2.2	Length:

10 years & 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:

The guidelines on Environmental Impact Assessment have been published by Ministry of Environment and Forests (MoEF), Government of India (GoI) under Environmental Impact Assessment notification 14th September, 2006[32] & the amended notification dated 01/12/2009[33].

Following are the aspects considered during Environmental Impact Assessment of any project activity:

1. Air Quality – Wind power projects do not release harmful pollutants, particulate matter into air, except during construction phase of the project, which is considered as negligible.
2. Water Quality – Wind power projects do not release any effluents, chemicals or other pollutants into water bodies.
3. Noise – The noise pollution levels are very less for wind projects. Further as the project activity is located away from the residential area, same has no effect on the local population.
4. Land / Soil Environment – Wind power projects do not adversely affect the soil ecology of the region.
5. Terrestrial & Aquatic ecology – There are no adverse effects of wind projects on terrestrial & aquatic ecology of the region.
6. Public health – Wind power projects are clean source of energy, free from any pollution. Hence, the projects do adversely affect on public health
7. Socio economic aspects – Wind power projects benefit the local area as explained in section A.2 above.

[32] EIA Notification 2006, http://envfor.nic.in/legis/eia/so1533.pdf
[33] http://moef.nic.in/downloads/rules-and-regulations/3067.pdf

Thus, as per Ministry of Environment and Forests (MoEF), Government of India (GoI), any negative impact of wind power projects on different elements of environment is either negligible or nil.

Further as per Ministry of Environment and Forests (MoEF), Government of India (GOI), *Any person who desires to undertake any new project or the expansion or modernisation of any existing industry or project listed in the Schedule I shall submit an application to the Secretary, Ministry of Environment and Forests, New Delhi.*

As the wind power generation projects are not listed in schedule I so it does not require Environmental Impact Assessment.

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:

Wind energy projects are considered environmentally safe and as per Host party- India no EIA is required.

SECTION E. Stakeholders' comments

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

The stake holder meeting was conducted in Govt. Secondary School at Belwa Ranaji Village (Ratan Ka Bas), Taluka: Shergarh, District: Jodhpur on 08/01/2010 (11.30 a.m. to 13.00 p.m.). The meeting was arranged for five companies along with M/s. Chhotabhai Jethabhai Patel & Co. CJP was represented by Mr. D. T. Shah and Mr. Kamlesh Upadhyay. The stake holders were identified based on the sustainability impact (direct & indirect) of this project activity on the life of the local people.

The meeting was coordinated by Suzlon Energy Limited. Mr. Gaurav Jain represented Suzlon in the meeting. The stake holders were invited to the meeting by public notice on 24/12/2009 & also by newspaper advertisement on 01/01/2010.

The project proponents & Suzlon welcomed the stakeholders for the meeting. Language of the meeting was Marwari and Hindi. Mr. Gaurav Jain explained the purpose of the meeting to the present stakeholders and introduced all the stakeholders to the representatives of all the companies. He briefed the stakeholders about the concept of Clean Development Mechanism, wind technology by Suzlon, environmental benefits of the wind power projects.

During the meeting, Mr. Shah explained about the power-deficit scenario in India and the need of energy. He informed stakeholders about their Group business and keen interest by the CEEJAY Group in development of renewable energy project. The project at RKB is the second CDM project activity undertaken by the Firm, the previous one being at Sinnar, Nashik in Maharashtra.

All other project proponents also expressed similar sentiments about wind energy and the worldwide phenomenon of global warming and how it could be tackled by generating power from renewable sources such as wind, solar etc.

After satisfying the queries raised by the stakeholders and receiving feedback about the project activity from them; the stakeholder meeting ended with vote of thanks by Suzlon and PPs.

E.2	Summary of the comments received:

During the meeting the project proponents & Suzlon invited the stakeholders to offer their comments / feedback and asked if any of the members had any question related to the project.

The common queries raised by the villagers were if their villages will get an increased power supply due to the project activity. They also enquired about investment of government in other renewable sources of power apart from wind.

PPs answered the first query explaining to the villagers that once the electricity is generated by the project activity, it will be directly fed into the state grid. It is the decision of the state grid where to make it available considering the available amount of power and the demand.

With respect to the second query, PPs made the villagers aware of regulatory & logistical difficulties in the development of renewable projects like hydro and solar. They involve displacement of villages, problem of wheeling and storing of energy over long distances & long periods of time. The uncertainty of renewable sources was explained to the stakeholders by giving the case of hydro power where the input depends upon the amount of rainfall during monsoon. In spite of this, government has invested in the renewable energy sector in the past like Bhakra Nangal Dam, Hirakud Dam. Currently also, government has strongly focused on renewable technologies by bringing out National Action Plan on Climate Change focusing majorly on harnessing solar energy and so on.

The PP then enquired whether wind power projects have proven beneficial to the village and if yes, in what manner. To this question, the villagers gave a positive response illustrating the different improvements made in the village due to the project activity. Example: Medical facilities, availability of ambulance & oxygen cylinders and civil work contracts to the local people. Also, the project personnel have maintained a good rapport with the villagers. Different employment opportunities have been created for the villagers like security guards, drivers, other work pertaining to the project like hiring transport services, couriers and office automation facilities such photocopying, fax, printing etc. which made them possible to make a living closer to the home rather than going far away to the cities.

Thus, in view of the stakeholders, the village has benefitted from the wind power projects.

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

No negative comments were received on the project activity, so no additional measures are required by the PP.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	M/s Chhotabhai Jethabhai Patel & Co.
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Represented by:	
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Salutation:	Mr.
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Direct FAX:	NA
Direct tel:	NA
Personal E-Mail:	-

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

The project activity is not availing any public funding.

Annex 3

BASELINE INFORMATION

The baseline is explained under section B.6.

Annex 4

MONITORING INFORMATION

The monitoring information is detailed under section B.7

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