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:

Bundled Wind Power Project in Maharashtra & Gujarat by WPPL
Version: 7
Date : 17/11/2010

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

The proposed project is a bundled project activity which involves establishment of 2.7 MW Wind Power Project enabling generation by Wind Electric Generators (WTGs). 2.7 MW bundled project consists of 1.5 MW in Maharashtra and 1.20 MW in Gujarat. The project activity involves two sub bundles of different capacities by Amenity Developers & Builders (hereafter ADB) and Western Precicast Pvt. Ltd. (Hereafter WPPL or project participant). WPPL will be co-ordinating the project activity. Other promoters have accordingly authorized WPPL.

The bundled project activity consists of -

- Sub Bundle I
  - WPPL Wind Turbines
  - 1 no. x 1.5 MW
  - Site Maharashtra
- Sub Bundle II
  - ADB Wind Turbines
  - 2 nos. x 0.6 MW
  - Site Gujarat

The electricity generation from this bundled project activity will contribute to GHG reductions estimated at 45,720 tCO_2e over crediting period of 10 years. Within ten years of crediting period revenue from emission reductions will help to mitigate the risks involved in Renewable Energy Technology. Estimated life of the project activity is 20 years. The project activity can evacuate approximately 5,046 MWh of renewable power annually to the power deficit NEWNE grid mix.

The bundled project activity consists of the following sub-bundles:

Sub bundle	Name of the Sponsor	Installed Capacity (MW)	Unique Identification No.	Technology Used	Substation	WTG Location District / State
1	WPPL	1.5	T-500	Suzlon S-82	Khaprale	Nashik / Maharashtra
2	ADB	0.6	M-481	Suzlon S-52	Nani Khahar	Kutch/ Gujarat
		0.6	M-496			
	Total	**2.70**				

Purpose of the project activity:

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 state electricity utility to contribute to climate change mitigation efforts.

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

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

Contribution of project activity to sustainable development:

As per the Xth - plan projections by Ministry of Coal, Govt. of India (GoI), out of the total coal demand in India most of the coal is projected to be required to produce power/electricity to meet the basic requirement of various sectors [1].

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

Government of India has stipulated following indicators for sustainable development in the interim approval guidelines[2] for CDM projects.

1. Social well-being

The proposed project activity leads to alleviation of poverty by establishing direct and indirect employment benefits accruing out of ancillary units for manufacturing towers, for erecting the WTGs and for maintenance during operation of the project activity. The infrastructure in and around the project area will also improve due to project activity. This includes development of road network and improvement of the quality of electricity in terms of its availability and frequency as the generated electricity is fed into a deficit NEWNE grid mix.

2. Economic well-being

The project activity leads to an investment of about INR 166.01 million to a developing region which otherwise would not have happened in the absence of the project activity. The generated electricity will be fed into the NEWNE Regional Grid through local grid, thereby improving the grid frequency and availability of electricity to the local consumers (villagers and sub-urban habitants) which will provide new opportunities for industries and economic activities to be setup in the area thereby resulting in greater local employment, ultimately leading to overall development. The project activity also leads to diversification of the national energy supply, which is dominated by conventional fuel based generating units.

3. Environmental well-being

The project utilizes wind energy for generating electricity which otherwise would have been generated through operation of existing or new additional power plants in the NEWNE grid mix, thereby contributing to the reduction in specific emissions (emissions of pollutant/unit of energy generated) including GHG emissions. As wind power projects produce no end products in the form of solid waste (ash etc.), they address the problem of solid waste disposal encountered by most other sources of power. Being a renewable source, using wind energy to generate electricity contributes to

[1] http://www.coal.nic.in/annrep0607.pdf Page no. 48
[2] Ministry of Environment and Forests web site: http://envfor.nic.in:80/divisions/ccd/cdm_iac.html

resource conservation. Thus the project causes no negative impact on the surrounding environment contributing to environmental well-being.

4. Technological well-being

The project activity leads to the promotion of 1.5 MW and 0.6 MW WTGs in the region, demonstrating the success of wind turbines, which feed the generated power into the nearest sub-station, thus increasing energy availability and improving quality of power under the service area of the substation. Hence, the project leads to technological well-being.

In view of the above, the project participant considers that the project activity profoundly contributes to the sustainable development.

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).	• Private entity - M/s Western Precicast Pvt. Ltd.	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.		

Please refer contact information in Annex – 1 to this PDD.

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

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

A.4.1.1 Host Party(ies):

Country: India.

A.4.1.2 Region/State/Province etc.:

Sub Bundle I
Maharashtra State: It varies from
Latitude : From 23° 04’ 16” N (N 23.071111)
Longitude : From 68° 48’ 44” E (E 68.812222)

Sub Bundle II
Gujarat State : It varies from
Latitude : From 19° 50’ 00” N (N 19.833333) to 19° 51' 00” N (N 19.850000)
Longitude : From 74° 00' 00” E (E 74.000000) to 74° 40’ 00” E (E 74.666666)

A.4.1.3 City/Town/Community etc:

Sub bundle I:

Village : Konambe
Taluk : Sinnar
District : Nashik

Sub bundle II
Village : Moti Sindholi
Taluk : Abdasa
District : Kutch

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

Sub bundle – I (WPPL)	
Capacity	1.5 MW
Model	S-82
Machine No.	T-500
Survey No.	968
Date of commissioning	23/09/2008
Sponsor	WPPL
Village	Konambe
Tehsil	Sinnar
District	Nashik
Latitude[3]	23° 04’ 16” N
Longitude	68° 48’ 44” E

Sub bundle – II (ADB)		
Capacity	0.6 MW	0.6 MW
Model	S-52	S-52
Machine No.	M-481	M-496
Survey No.	211/p	58/1p
Date of commissioning	30/09/2007	29/09/2007
Sponsor	ADB	ADB
Village	Moti Sindholi	Moti Sindholi
Tehsil	Abdasa	Abdasa
District	Kutch	Kutch
Latitude[4]	19° 51' 00” N	19° 50’ 00” N
Longitude	74° 00' 00” E	74° 40’ 00” E

[3] http://www.fallingrain.com/world/IN/16/Sinnar.html
[4] http://wikimapia.org/406399/Village-Rava-Abdasa-Kutch-Gujarat-India-□□□-□□□-□□□□□□-□□□□□□

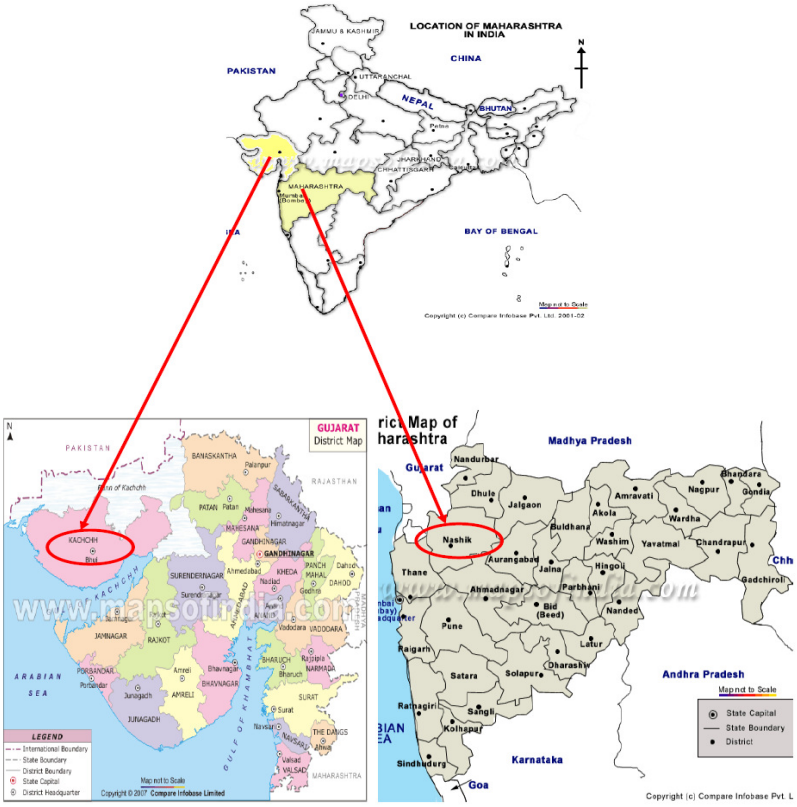


Figure 02, Location Map

The nearest airport for the Sub bundle-II (ADB) is Bhuj airport which is located at approximately 70 Kms from the Kutchh site. From Bhuj city project site is connected through road network. State transport buses & private taxi services are available from Bhuj.

The Sub bundle I (WPPL) is located at Nashik which is 185 km from Mumbai and accessible through NH-3 i.e. Mumbai- Agra highway via Thane-Kasar-Igatpuri. Nashik is 220 km away from Pune. Nearest airport is Mumbai. This Nashik station is one of the major station on central railway line and is directly connected with Mumbai and regular train services are available from here to many cities in India.

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

Sectoral Scope : **1 –** Energy industries (renewable / non renewable sources)
Project Type : **I –** Renewable Energy Projects
Project Category : **D. –** Grid connected renewable electricity generation (Version 15, EB 50)

Technology

This project is a clean renewable energy project that uses wind energy for generation of electricity with available proper conversion technology. This meets the basic requirement of AMS I. D. (Version 15) of Appendix B of the simplified modalities and procedures for small-scale CDM project activities.

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

Wind has considerable amount of kinetic energy when blowing at high speeds. This kinetic energy when it passes through the blades of the wind turbines it is converted into mechanical energy and rotates the wind blades. When the wind blades rotate, the connected generator also rotates, thereby producing electricity.

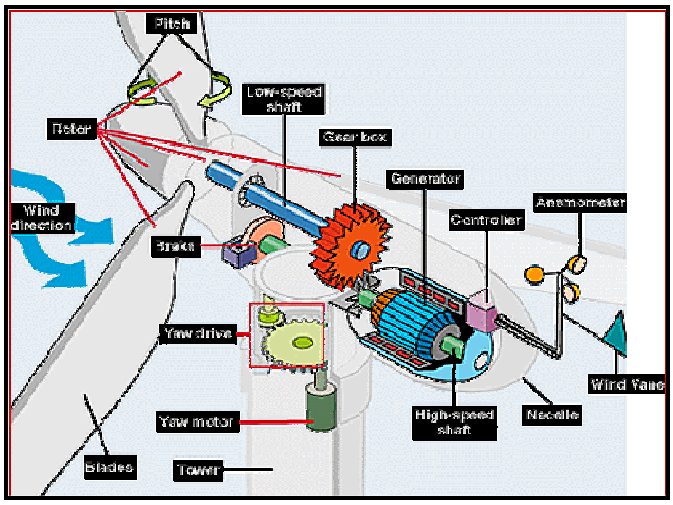


Figure 01, Major Mechanical Parts of a Wind Turbine

The technology is a clean technology since there are no GHG emissions associated with the electricity generation. The project consists of 2 types of Suzlon make WTGs (S 82 – 1 no. & S 52 – 2 nos.). Salient features of these WTGs are as follows.

Table-1: Salient Features of 1.5 MW (S-82) WTG

Sr. No.	Particulars	Specifications
1.	Rotor diameter	82 m
2.	Hub height	80 m
3.	Installed electrical output	1500 kW
4.	Cut-in wind speed	4.0 m/s
5.	Rated wind speed	14.0 m/s
6.	Cut-out wind speed	20 m/s
7.	Rotor swept area	5281 m^2
8.	Rotational speed	1511 rpm
9.	Rotor material	GRP
10.	Regulation	Pitch
11.	Generator	Asynchronous Generator, 4 pole with slip ring
14.	Operating voltage	690 V
15.	Frequency	50 Hz
16.	Enclosure class	IP 54
17.	Insulation class	H
18.	Slip control	Unique Macro slip providing slip up to 16.7 %
19.	Gear box	3-stage gearbox, 1 planetary & 2 helical.
20.	Gear ratio	1:95.09
21.	Nominal load	1650 kW

22.	Type of cooling	Oil cooling system, Forced lubrication
23.	Yaw drive system	Active electrical yaw motors
24.	Yaw bearing	Polyamide slide bearing
25.	Aerodynamic brake	3 independent system with blade pitching
26.	Mechanical brake	Hydraulic disc brake
27.	Design standards	GL special class

Salient Features of 0.60 MW (S 52) WTG

Sr. No.	Particulars	Specifications
1.	Rotor diameter	52m
2.	Hub height	75 m
3.	Installed electrical output	600 kW
4.	Cut-in wind speed	4 m/s
5.	Rated wind speed	13 m/s
6.	Cut-out wind speed	25 m/s
7.	Rotor swept area	2124 m^2
8.	Rotational speed	24 rpm
9.	Rotor material	Glass reinforced epoxy, vacuum injected
10.	Regulation	Pitch Regulated
11.	Generator	Single speed asynchronous generator
12.	Rated output	600 kW
13.	Rotational speed	1539 rpm
14.	Operating voltage	690 V
15.	Frequency	50 Hz
16.	Protection	IP 56
17.	Insulation class	Class H
18.	Cooling system	Air cooled
19.	Gear box	3 stage (1 planetary and 2 helical).
20.	Manufacturer	Flender - Winergy / Equivalent
21.	Gear ratio	1: 63.633
22.	Nominal load	660 kW
23.	Type of cooling	Oil cooling system
24.	Yaw drive system	2 Active electrical yaw motors
25.	Yaw bearing	Polyamide slide bearing
26	Aerodynamic brake	3 Independent systems with blade pitching
27.	Control unit	Microprocessor control indicating operation conditions. Control includes thyristor switchgear watchdog for operation, monitoring, log with real time, local control and servicing interface. Optional remote monitoring & operation. UPS backup system.
28.	Tower	Free standing, lattice tower, hot dip galvanized
29.	Design standards	GL class II

The project technology manufactured, operated & maintained indigenously and doesn't involve any technology transfer from foreign countries.

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

Years	Estimation of annual emission reductions in tonnes of CO_2 e
2011 (March to December)	3,810
2012	4,572
2013	4,572
2014	4,572
2015	4,572
2016	4,572
2017	4,572
2018	4,572
2019	4,572
2020	4,572
2021(January to February)	762
Total estimated reductions (tonnes of CO_2 e)	45,720
Total number of crediting years	10
Annual average of the estimated reductions over the crediting period (tCO_2 e)	4,572

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

The project has not received any Official Development Assistance (ODA) from Annex I countries. The project is a unilateral project.

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

According to "Compendium of guidance on the debundling for SSC project activities". As per the step I, Determining the occurrence of debundling; M/s. Amenity Developers & Builders and Western Precicast Pvt. Ltd. had no registered SSC PA with the same project participant as the proposes SSC PA, hence; the proposed SSC PA is not deemed to be a debundled component of a large project activity, therefore is eligible to use the simplified modalities and procedures for SSC PAs.

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:

Title: Grid connected renewable electricity generation

Reference: The project activity meets the eligibility criteria to use the simplified modalities and procedure for small-scale CDM project activities as set out in paragraph 6 (c) of decision 17/CP.7. Details of methodology for baseline calculations for CDM projects of capacity less than 15 MW are available in the "Appendix B of the simplified modalities and procedure for small scale CDM project activities".

Methodology : AMS I. D (Version 15, EB 50)
Type I : Renewable Energy Project (Small Scale)
Category : "D", Grid Connected Renewable Electricity Generation

Reference has been taken from indicative simplified baseline and monitoring methodologies for selected small scale (CDM projects less than 15 MW) project activity categories.

Tool referred with above methodology is –
Version 1.1 of "Tool to calculate the emission factor for an electricity system"

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

Categories I.A, I.B and I.C involve renewable energy technologies that supply electricity, mechanical and thermal energy, respectively, to the user directly. Renewable technologies that supply electricity to the grid are covered in category I.D. The category comprises renewable technologies such as small hydro, wind, geothermal and renewable biomass that supply electricity to and/or displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generation unit.

The project activity is 2.7 MW bundled wind power project & remains same throughout the crediting period, which is less than the specified limit of 15 MW for small scale project activities. The project activity supply the generated power into the Khaprale & Nani Khahar sub-station. Hence, the project activity qualifies the small-scale methodology applicability criteria, which is as follows:

Methodology : AMS I. D (Version 15, EB 50)
Type I : Renewable Energy Project (Small Scale)
Category : "D", Grid Connected Renewable Electricity Generation

B.3 Description of the project boundary:

Project boundary specified as per the paragraph 7 of AMS. I. D. version 15 and specified in the Appendix B of simplified modalities and procedures is that encompasses the physical, geographical site of the renewable generation source. This includes the wind turbine installation, pooling and concerned electricity sub-stations. The proposed project activity evacuates the power to the NEWNE Grid mix. Therefore, all the power plants contributing electricity to the NEWNE Grid mix is taken in the connected (project) electricity system for the purpose of baseline estimation. The meter which will be used to measure the electricity supplied to the grid will be at substation and will be an integral part of project boundary.

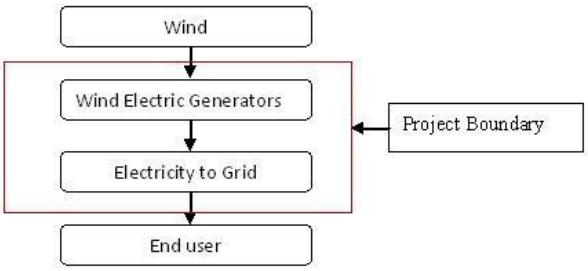


Figure 03, Project Boundary

B.4 Description of baseline and its development:

Description of Baseline:

The para 8 describes the baseline scenario for the landfill gas, waste gas, waste water treatment and agro industries projects. While para 9 describes baseline scenario exclusively for fuel oils/ or diesel fuel. However, for this project activity para 10 is applicable.

As per the Para 10 of baseline in AMS I. D. *"All other systems, the baseline emissions are the product of electrical energy baseline $EG_{BL,y}$ expressed in kWh of electricity produced by the renewable generating unit multiplied by an emission factor".*

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

Where:

BE_y = Baseline Emissions in year y; t CO_2
$EG_{BL,y}$ = Energy baseline in year y; kWh
EF_{CO2} = CO_2 Emission Factor in year y; t CO_2e/kWh

Baseline Estimation:

The wind power project produces electricity which is otherwise being produced by existing power plants in grid mix. This leads to the GHG emissions. The wind power produced being GHG neutral will not only displaces fossil fuel dominated power but will reduce the associated emissions with existing power generation plants in the NEWNE regional grid mix of India.

As per the version 15 of AMS I. D to estimate the baseline emissions, the CO_2 emission factor is calculated as per the procedures laid in paragraph 11 (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'.*

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

The combined margin CO_2 emission factor ($EF_{grid,,CM,y}$) is calculated as follows:

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

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;

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 installed capacity of the project is 2.7 MW, is less than the limiting capacity of 15 MW and is thus eligible to use small-scale simplified methodologies. Further, the project activity is generation of electricity for a grid system using wind energy. Hence, the type and category of the project activity matches with I. D. as specified in Appendix B of the indicative simplified baseline and monitoring methodologies for small-scale CDM project activities. In accordance with EB 49, annex 22 "Guidance on the demonstration and assessment of prior consideration of the CDM", WPPL is required to demonstrate:

- Awareness of the CDM prior to the project activity start date, and that the benefits of the CDM were a decisive factor in the decision to proceed with the project.
- Continuing and real actions taken to secure CDM status for the project in parallel with its implementation.

WPPL and ADB are the two project entities promoted by the same promoter (Mr. Ajay Jadhav is Managing Director of WPPL and he is also Managing partner of ADB). The PP had communication with Senergy Global regarding success fees post registration emission reduction revenue. As Senergy Global is a buyer it proves seriousness of Project Proponent towards CDM. The purchase order was only released when the promoters were convinced that part of risk associated with investment in the wind sector will be requited through funds received from CDM. The following table represents the chronology of events that took place prior to start of project activity.

Sr. No.	Date	Event
1.	13/07/2006	WPPL sent a signed agreement copy to Senergy Global regarding success fees post registration emission reduction revenue for their other WTG. It clearly indicates prior knowledge of CDM to PP. This agreement is not part of this project activity. WPPL has already registered these WTGs under VCS (https://vcsprojectdatabase1.apx.com/mymodule/ProjectDoc/EditProjectDoc.asp?id1=429)
2.	13/08/2006	WPPL letter to Senergy requesting to send back a duly signed agreement.
3.	22/09/2006	Senergy mail to WPPL regretting unability to sign the agreement due to frozen bundle size.

In order to demonstrate continued and real actions taken by the WPPL & ADB towards securing CDM funds, the following evidences have been submitted to the DOE:

Chronology of Events for Sub bundle – I (WPPL)

SrNo	Activity	Date
1.	Discussion of Wind power project and CDM benefits in management meeting	20/06/2007
2.	Offer letter from WTG supplier	15/05/2008
3.	Board resolution for implementation of project activity based on offer letter by considering CDM benefits	17/05/2008
4.	PO for 1.5 MW WTG	31/05/2008
5.	Deed of Sub lease	01/08/2008
6.	Commissioning date	23/09/2008
7.	Stakeholder meeting	18/12/2008

ADB Chronology of Events Sub bundle – II (ADB)

SrNo	Activity	Date
1.	Discussion of Wind power project and CDM benefits in management meeting	25/06/2007
2.	Offer letter from WTG supplier	11/07/2007
3.	Board resolution for implementation of project activity based on offer letter by considering CDM benefits	13/07/2007
4.	Work order for installation of WTGs	03/08/2007
5.	SUZLON letter for PO acceptance	06/08/2007
6.	Commissioning date 1st WTG	29/09/2007

7.	Commissioning date 2nd WTG	30/09/2007
8.	Stakeholder meeting	23/07/2008

Chronology of Events for Project Activity

SrNo	Activity	Date
1.	Communication with CDM consultant	10/08/2007
2.	Appointment of CDM consultant	29/08/2007
3.	Appointment of validator	23/09/2008
4.	PIN and PDD submitted to MoEF	16/09/2008
5.	HCA meeting	24/12/2008
6.	HCA received	29/01/2009
7.	PDD webhosted on the UNFCCC website	05/11/2008

✓ **Justification for additionality of the project**

UNFCCC simplified modalities seek to establish additionality of the project activity as per Attachment A to Appendix B and as per the "Non-binding best practice examples to demonstrate additionality for SSC project activities." Option a) i.e. Investment barrier to demonstrate additionality. To demonstrate the Investment barrier WPPL and ADB has carried out Investment analysis as follows.

✓ **Investment Barrier**

The investment analysis is carried out by 'benchmark analysis' as referred in additionality tool (version 05.2). Since the CDM project activity generates financial benefits other than CDM related income, the sub-step 2b-option I is not followed. *As per sub-step 2b one can either chooses option II (i.e. Apply investment comparison analysis.) or option III (i.e. Apply benchmark analysis.) to indentify most suitable financial/economic indicator. Hence project promoter uses* sub-step 2b-*option III for the project. Paragraph (6) Option III describes that discount rates and benchmarks 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 participants can demonstrate that the above Options are not applicable and their indicator is appropriately justified.

Additionality Tool (Version 05.2) requires the WPPL and ADB 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 $/kWh or levelized cost of delivered heat in $/GJ) most suitable for the project type and decision-making context. WPPL and ADB has identified Equity IRR as appropriate financial indicator and benchmark has been derived from various sources of information relating to items (a).

1. As per the above method (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.*

   Suitable benchmark can be derived from Capital Asset Pricing Model (CAPM) method. The CAPM) is used worldwide to determine the required/expected return on equity based on potential risk of an investment. William Sharpe published the CAPM in 1964 and for which he was awarded the Nobel Prize in 1990. The cost of equity is evaluated using the formula: CAPM gives the expected return of an Investment i.e. addition of rate of a risk-free security plus a risk premium. If this expected return does not meet or beat the required return, then the investment should not be undertaken.

   WPPL took the decision on 15/05/2008 and ADB took decision on 13/07/2007, accordingly they created a portfolio of all the power generating companies listed on BSE as on 30/04/2008 (BF Utilities Ltd, CESC Ltd, Gujarat Industries Power Co Ltd, Neyveli Lignite Corporation Ltd, Reliance Infrastructure Ltd, Tata Power, NTPC, GVK Power & Infrastructure Ltd[5] and Jaiprakash Hydro-Power Ltd) with a trading history of at least two years and calculated the RoE. Please refer the excel sheet for detail calculation.

   Calculation of Required Rate of Return by Capital Asset Pricing Model (CAPM)

   Required return = $R_f + \beta^* (R_m - \text{Avg } R_f)$

Sr. No.	Particular	ADB	WPPL
1	Date of Board decision	13/07/2007	15/05/2008
2	Cut off date considered for benchmark calculation	30/06/2007	30/04/2008
3	Risk free return (R_f)	8.31%[6]	7.90%[7]
4	Average Rusk free rate	10.66%[8]	10.50%[9]
5	Beta **β**	0.87	1[10]
6	Return on Equity	14.01%	14.86%

Calculation and comparison of financial parameter:

Assumptions for Investment Analysis:

- Amenity Developers and Builders:

Particulars	**Unit**	**Basis**	**Amenity Developers & Builders (ADB)**
Nature of Concern			Partnership

[5] ADB has not considered as GVK Power was not having trading record as on 30/06/2007

[6] http://rbidocs.rbi.org.in/rdocs/Bulletin/PDFs/77804.pdf

[7] http://rbidocs.rbi.org.in/rdocs/Bulletin/PDFs/83924.pdf

[8] http://rbi.org.in/scripts/AnnualReportPublications.aspx

[9] http://rbi.org.in/scripts/AnnualReportPublications.aspx

[10] Weighted average beta comes to 1.15, which is on higher side hence beta of 1 is considered on conservative side.

			Firm
Location			Gujarat
Capacity	KW	Proposal from Suzlon	600
Machines	No.	Proposal from Suzlon	2
Total Capacity	KW	Proposal from Suzlon	1200
Annual Generation from project	Million kWh	Calculation based on PLF	2.42
PLF	%	As per bank document which is as per para 3a, annex11 EB 48	23.00%
Tariff Rate	INR/kWh	point 16, Tarrif Rate, GERC Order dated 11th August 2006	3.37
O & M	INR Million	Proposal from Suzlon	1.30
Escalation in O & M Exp.	%		5.00%
O & M Free For	Years		1
Insurance	INR Million	Proposal from Suzlon	0.11
Interest Rate	%	Proposal from Suzlon	12%
Cost of Project	INR Million	Proposal from Suzlon	84.20
Term Loan	INR Million	Proposal from Suzlon	58.94
Promoters Contribution	INR Million	Proposal from Suzlon	25.26
Repayment Period	Quarters	Proposal from Suzlon	28
Moratorium Period	Quarters		4
Income Tax	%	http://indiabudget.nic.in/ub2006-07/bh/bh1.pdf	33.99%
MAT Rate	%	Partnership Concern	Not Applicable
Equity IRR			4.81%

- Western Precicast Pvt. Ltd.:

Particulars	Unit	Basis	Western Precicast Pvt. Ltd.
Nature of Concern			Pvt. Ltd. Company
Location			Maharashtra
Capacity	KW	Proposal from Suzlon	1500
Machines	No.	Proposal from Suzlon	1
Total Capacity	KW	Proposal from Suzlon	1500
Annual Generation from project	INR in Million	Calculation based on CUF	2.63
PLF	%	As per bank document which is as per para 3a, annex11 EB 48	20.00%
Derating After 10th year	%	MERC Guideline, page no. 33, Para 2.2.3	5.00%

Tariff Rate	INR/kWh	Page no. 18, Para no 1.5.3.1 MERC Wind project tariff order dated 24/11/2003 http://www.mercindia.org.in/pdf/Detail_Wind_Energy_Order.pdf	3.50
Escalation in Selling Rate	up to 13th Year		0.15
O & M	INR in Million	As per Offer letter	1.55
Escalation in O & M Exp.	%		5.00%
O & M Free For	Years		1
Insurance	INR in Million	As per Offer letter	0.14
Interest Rate	%	AS per previous term loan sanction letter for WPPL from UTI Bank Ltd. letter no. UTIB/PBA/06-07, dated 27-01-2007	10.75%
Cost of Project	INR in Million	As per Purchase Order	90.00
Term Loan	INR in Million	AS per previous term loan sanction letter for WPPL from UTI Bank Ltd. letter no. UTIB/PBA/06-07, dated 27-01-2007	67.50
Promoters Contribution	INR in Million	Calculation	22.50
Repayment Period	Months	AS per previous term loan sanction letter for WPPL from UTI Bank Ltd. letter no. UTIB/PBA/06-07, dated 27-01-2007	66
Moratorium Period	Months		6
Income Tax	%	http://indiabudget.nic.in/ub2006-07/bh/bh1.pdf	33.99%
MAT	%	http://indiabudget.nic.in/ub2006-07/bh/bh1.pdf	11.33%
Equity IRR			9.75%

The returns from the proposed project activity is -

Item	Rate of Return
Western Precicast Pvt. Ltd.	9.75%
Amenity Developers & Builders	4.81%

Sensitivity Analysis

The Guidance on the Assessment of Investment Analysis (Version 02), paragraph 16, 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.

The different parameters that affect the viability of a wind power project are mentioned below –

Parameters	Comments
Electricity Generation/PLF	*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	*This is another critical parameter for power projects & hence viability of the project will be affected by fluctuation in this parameter. Sensitivity analysis has therefor been carried out for it.*
O & M Cost	*This is another critical parameter for power projects & hence viability of the project will be affected by fluctuation in this parameter. Sensitivity analysis has therefor been carried out for it.*
Income from sale of electricity	*The parameter is dependent on two factors; PLF and tariff rate. Sensitivity analysis for PLF has already been carried out. The tariff rate was available with the Project Promoter vide the Maharashtra Electricity Regulatory Commission Order[11] dated.24.11.2003; the WPPL has also signed a Power Purchase Agreement with MSEDCL in which the Tariff rate is fixed at INR.3.50/ KWh with an escalation of INR. 0.15 every year up-to 13th year.* *So, sensitivity analysis has been carried out for change in tariff after 13th year.*

Sensitivity Analysis based on PLF - Equity IRR			
Variation	+10%	Base Case	-10%
Western Precicast Pvt. Ltd.	12.61%	9.75%	6.81%
Amenity Developers & Builders	6.98%	4.81%	2.66%
Sensitivity Analysis based on Project Cost - Equity IRR			
Variation	+10%	Base Case	-10%
Western Precicast Pvt. Ltd.	7.64%	9.75%	12.29%
Amenity Developers & Builders	3.34%	4.81%	6.63%
Sensitivity Analysis based on O & M Expenses - Equity IRR			
Variation	+10%	Base Case	-10%
Western Precicast Pvt. Ltd.	9.27%	9.75%	10.22%
Amenity Developers & Builders	4.41%	4.81%	5.21%
Sensitivity Analysis based on Tariff Rate14th year onwards for Maharashtra - Equity IRR			
Variation	+10%	Base Case	-10%
Western Precast Pvt. Ltd.	10.15%	9.75%	9.33%

It can be seen from the above that even with an increase in generation by 10% or reduction in cost by 10% or decrease in O & M by 10% or increase in tariff by 10% from 14th year onwards, the IRR of the project is not meeting the benchmark selected by the promoter. The project activity is clearly unattractive in absence of CDM revenues. The promoters were aware of this fact and had considered this investment only in light of carbon credits being available for this project. With the inclusion of CDM benefits in project inflow, IRR of the project will improve and it will help to mitigate some of the financial risk attached with the project.

The above paragraphs explain that the proposed project activity was not a business as usual case for the project proponent. It thus satisfies the additionality conditions as required under Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM

[11] Maharashtra Electricity Regulatory Commission
Order: Case no. 17(3), 3, 4 & 5 of 2002, Date: November, 24 2003; (Website: www.mercindia.com)

project activities and as per the "Non-binding best practice examples to demonstrate additionality for SSC project activities.". Hence, project is additional.

B.6 Emission reductions:

B.6.1 Explanation of methodological choices:

Baseline methodology for projects under AMS I.D. (Version 15) has been detailed in paragraphs 8-13 (AMS I.D.) of the above-mentioned document. Paragraph 10 (Type I.D. Version 15) applies to this project activity, which states that:

For all other systems, the baseline emissions are the product of electrical energy baseline $EG_{BL,y}$ expressed in kWh of electricity produced by the renewable generating unit multiplied by an emission factor.

$BE_y = EG_{BL,y} * EF_{CO2}$
In PDD $\mathbf{EF_{grid, CM, y}} = EF_{CO2}$

Where

BE_y = Baseline Emissions in year y; t CO_2
$EG_{BL,y}$ = Energy baseline in year y; kWh
EF_{CO2} = CO_2 Emission Factor in year y; t CO_2/kWh

As per paragraph 11 of AMS I. D. (version 15) 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 kg CO_2equ/kWh) of the current generation mix. The data of the year in which project generation occurs must be used*

In the proposed project, the baseline selected as per option (a). NEWNE Region grid is used as the reference region for estimating the Combined Margin. Using the methodology available for small-scale project activities, the Combined Margin emissions (in tCO_2 e/GWh) of regional grid of India is used for calculation of baseline. Actual CO_2 emission factor are used for the purpose.

In the proposed project, the baseline selected as per option (a). NEWNE Region grid is used as the reference region for estimating the Combined Margin. Using the version 1.1 of 'Tool to calculate the emission factor for an electricity system', the Combined Margin emission in (tCO_2 e/MWh) for regional grid of India is used for calculation of baseline. Actual baseline CO_2 emission database version 04 published by Central Electricity Authority (CEA) [12] of India is used for the purpose.

The baseline emission (BE_y) is calculated as follows:

$BE_y = EG_{BL, y}$ x $EF_{grid, CM, y}$

[12] http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm baseline CO_2 emission database version 04

$EF_{grid\ CM\ y}$ is determined as follows:

The weighted average of the Operating Margin emission factor ($EF_{grid,\ OM,y}$) and the Build Margin emission factor ($EF_{grid,\ BM,\ y}$)

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

For wind and solar projects, the default weights are as follows: $W_{OM} = 0.75$ and $W_{BM} = 0.25$ (owing to their intermittent and non-dispatchable nature).

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

Where

$EF_{grid\ OM,\ y}$ = Operating Margin CO_2emission factor in year *y* (tCO_2/MWh)
$EF_{grid\ BM,\ y}$ = Build Margin CO_2emission factor in year *y* (tCO_2/MWh)
W_{OM} = Weighting of operating margin emissions factor (%)
W_{BM} = Weighting of build margin emissions factor (%)

1. Calculation of operating margin emission factor for the region based on simple OM

For calculation of operating margin ($EF_{grid\ OM,\ y}$) four options are available:

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

According to Tool to calculate the emission factor for an electricity system' version01.1 dispatch data analysis should be the first choice but for the current project, dispatch data analysis cannot be used because of unavailability of data.

The simple OM method was used as the low-cost/must run resources constitute less than 50% of the total grid generation of NEWNE Grid in average of the five most recent years (CEA database Version 04). Refer Annex 3 for details.

Share of low cost / Must- run[13] (% of net generation)

	2005-06	2006-07	2007-08
NEWNE	18.0%	18.5%	19.0%
South	27.0%	28.3%	27.1%
India	20.1%	20.9%	21.0%

The above data clearly shows that the percentage of total grid generation by low cost/must run plants (on the basis of average of five most recent years) for the NEWNE grid is less than 50 % of the total generation.

Thus the average emission rate method cannot be applied, as low cost/must run resources constitute less than 50% of total grid generation. Also detailed data to apply Simple adjusted OM is not available.

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

Hence, the **Simple Operating Margin** can be used for the proposed project activity because low cost/ must run resources constitute less than 50% of total generation.

The operating margin emission factor has been calculated (*ex-ante*) using the full generation-weighted average for the most recent 3 years for which data are available at the time of PDD submission. The OM is calculated using 3 year data calculated by Central Electricity Authority (CEA) in their CO_2 baseline database

The simple OM emission factor ($EF_{OM,\ simple,\ y}$) is calculated as the generation-weighted average emissions per electricity unit (t CO_2/MWh or MU) of all generating sources serving the system, not including low-operating cost and must-run power plants.

$$\mathbf{EF}_{\mathbf{grid\ \ OM\ simple,\ y}} = \frac{\sum_{m} \mathbf{EG}_{\mathbf{m,\ y}} * \mathbf{EF}_{\mathbf{EL,\ m,\ y}}}{\sum_{m} \mathbf{EG}_{\mathbf{m,\ y}}}$$

Where:

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

$$EF_{EL,m,y} = \frac{\sum_{i} FC_{i,m,y} \cdot NCV_{i,y} \cdot EF_{CO2,i,y}}{EG_{m,y}}$$

Where:

$EF_{EL,m,y}$ = CO_2 emission factor of power unit *m* in year *y* (t CO_2/MWh)
$FC_{i,m,y}$ = Amount of fossil fuel type *i* consumed by power unit *m* in year *y* (Mass or volume unit)
$NCV_{i,y}$ = Net calorific value (energy content) of fossil fuel type *i* in year *y* (GJ / mass or volume unit)
$EF_{CO2,I,y}$ = CO_2 emission factor of fossil fuel type *i* in year *y* (t CO_2/GJ)
$EG_{m,y}$ = Net quantity of electricity supplied and delivered to the grid by power unit *m* in year *y* (MWh)
m = All power units serving the grid in year *y* except low-cost / must-run power units

I = All fossil fuel types combusted in power unit *m* in year *y*

y = Either the three most recent years for which data is available at the time of submission of the CDM-PDD to the DOE for validation (ex ante option) or the applicable year during monitoring (ex post option), following the guidance on data vintage in step 2

2. Calculation of build margin factor for the region (ex ante):

Build margin can be calculated as the generation weighted average emission factor (t CO_2/MWh) of all power units *m,* during the most recent year y for which power generation data is available, calculated as follows :

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

$BM_{,y}$ = Build margin CO_2 emission factor in year *y* (t CO_2/MWh)

$EG_{m,y}$ = Net quantity of electricity supplied 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* (t CO_2/MWh)

m = Power units included in the build margin

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

***3. Baseline emission factor* ($EF_{grid, CM, y}$)**

The baseline emission factor $EF_{grid, CM, y}$ is calculated as the weighted average of the operating margin emission factor ($EF_{grid\ OM, y}$) and the build margin emission factor ($EF_{grid\ BM, y}$), where the weights W_{OM} and W_{BM}, by default, are 75% W_{OM} & 25% W_{BM}, and $EF_{grid\ OM,y}$ and $EF_{grid\ BM,y}$ are calculated as described in Steps 1 and 2 above and are expressed in t CO_2/MWh or MU.

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

Data used for arriving at the $EF_{grid, CM, y}$

Values for all regional grids for Year 2004-2005 until FY 2006-2007, including inter-regional and cross-border electricity transfers. (CEA, User Guide: Version 4) See Annex-III

$$\mathbf{BE_y} = EG_{BL,y} * \mathbf{EF_{grid, CM, y}}$$

Where:

$EG_{BL,y}$ - is the net quantity of electricity supplied by the project in year y, and

$EF_{grid, CM, y}$ is the carbon emission factor of the grid

Step 1: Calculation of Operating Margin Emission Factor

The operating margin emission factor has been calculated from CEA database Version 04:

NEWNE Region	2005-2006	1.01949
	2006-2007	1.00835
	2007-2008	0.99917
Average		**1.00900 t CO_2/MWh**

Step 2: Calculation of the Build Margin Emission Factor $EF_{grid\ BM, y}$

For the year 2007-2008	NEWNE Region	0.59771 t CO_2/MWh

Step 3: Calculation of Baseline Emission Factor $EF_{grid, CM, y}$

The baseline emission factor $EF_{grid, CM, y}$ is calculated as the weighted average of the Operating Margin emission factor ($EF_{grid\ OM, y}$) and the Build Margin emission factor ($EF_{grid\ BM, y}$) :

For NEWNE Region

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

$EF_{grid, CM, y} = 1.00900 \times 0.75 + 0.59771 \times 0.25$

$EF_{grid, CM, y} = 0.90618$ t CO_2/MWh

Where the weights W_{OM} and W_{BM} are 75% and 25% respectively, and $EF_{grid\ OM, y}$ and $EF_{grid\ BM, y}$ are calculated as described in Steps 1 and 2 above and are expressed in t CO_2/MWh.

Baseline Emission factor: 0.90618 t CO_2/MWh

The project proponent wishes to use the $EF_{grid, CM, y}$ calculated Ex-ante, and has fixed the same for the entire crediting period and need not to monitor during the verification.

Project emissions:

As per the paragraph no. 14 of AMS I. D version 15, EB 50, for most renewable energy project activities, $PE_y = 0$.

Leakage

According to paragraph 15, of AMS I.D, version 15, EB 50 the leakage is considered if the energy generating equipment is transferred from another activity.

As the project activity does not involve any such type of transfer of equipment no leakage is considered. i.e. $LE_y = 0$.

Emission reductions:

Emission reductions are calculated as follows:

$ER_{, y} = BE_y - PE_y - LE_y$

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

Data / Parameter:	$EF_{grid\ CM\ y}$
Data unit:	t CO_2 / MWh
Description:	Ex-ante Combined Margin CO_2 emission factor for the NEWNE regional grid connected power generation in year y.
Source of data used:	Baseline Carbon Dioxide Emission Database Version 04 for the Indian Power Sector, by CEA
Value applied	0.90618
Justification of the choice of data or	The combined margin emission factor is calculated based on the OM & BM values. The values for OM and BM have been calculated by

description of measurement methods and procedures actually applied :	Ministry of Power, Central Electricity Authority, Govt. of India hence are authentic and reliable. **EF $_{grid, CM, y}$** is calculated as per the version 1.1 of "Tool to calculate the emission factor for an electricity system" http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm
Any comment:	The archive of data will be maintained for crediting period + 2 years. The archiving will be done both on paper and electronically.

Data / Parameter:	$EF_{grid\ OM, y}$
Data unit:	t CO_2 / MWh
Description:	CO_2 Operating Margin (including import) Emission Factor of theNEWNE Regional Grid
Source of data used:	Baseline Carbon Dioxide Emission Database version 4 for the Indian Power Sector, by CEA
Value applied:	1.00900
Justification of the choice of data or description of measurement methods and procedures actually applied :	The values for OM have been calculated by Ministry of Power, Central Electricity Authority Govt. of India, hence are authentic and reliable. http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm The $EF_{grid\ OM, y}$ is calculated by the CEA, Govt. Of India as per the version 1.1 of "Tool to calculate the emission factor for an electricity system"
Any comment:	The archive of data will be maintained for crediting period + 2 years. The archiving will be done both on paper and electronically.

Data / Parameter:	$EF_{grid\ BM, y}$
Data unit:	t CO_2 / MWh
Description:	CO_2 Build Margin Emission Factor of the NEWNE Regional Grid
Source of data used:	Baseline Carbon Dioxide Emission Database version 4 for the Indian Power Sector, by CEA
Value applied:	0.59771
Justification of the choice of data or description of measurement methods and procedures actually applied :	The values for BM have been calculated by Ministry of Power, Central Electricity Authority Govt. of India, hence are authentic and reliable. http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm The $EF_{grid\ BM, y}$ is calculated by the CEA, Govt. of India as per the version 1.1 of "Tool to calculate the emission factor for an electricity system"
Any comment:	The archive of data will be maintained for crediting period + 2 years. The archiving will be done both on paper and electronically.

B.6.3 Ex-ante calculation of emission reductions:

Baseline emissions are calculated as the kWh produced by the project activity multiplied by an emission coefficient for the NEWNE grid, calculated as the weighted average emissions (in kg CO_2equ/kWh) of the current generation mix.

$\mathbf{BE_y} = EG_{BL,y} * \mathbf{EF}_{\mathbf{grid, CM, y}}$

In PDD $\mathbf{EF}_{\mathbf{grid, CM, y}} = EF_{CO2}$

Where $EG_{BL,y}$ is the net electricity supplied by the project in year y, and $EF_{grid, CM, y}$ is the carbon emissions factor of the NEWNE grid.

EF_{CO2} is taken from Baseline Carbon Dioxide Emission Database Version 04 provided by CEA, Govt. of India

For Sub bundle-I

- Net electricity supplied to the grid by the project activity = 2,628 MWh/yr

Baseline Emission = Net electricity supplied to grid X Ex-ante Emission Factor
= 2,628 × 0.90618 t CO_2 / MWh
Baseline Emission = 2,381 t CO_2 / yr

For Sub bundle-II

- Net electricity supplied to the grid by the project activity = 2,418 MWh/yr

Baseline Emission = Net electricity supplied to grid X Ex-ante Emission Factor
= 2,418 × 0.90618 t CO_2 / MWh
Baseline Emission = 2,191 t CO_2 / yr

Total Baseline Emission = Sub bundle-I + Sub bundle-II
Total Baseline Emission = 2,381 + 2,191 = 4,572 t CO_2 / yr

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

Year	Estimation of project activity emission (t CO_2e)	Estimation of baseline emissions (tCO_2e)	Estimation of Leakage (t CO_2e)	Estimation of overall emission reduction (tCO_2e)
2011(March to December)	0	3,810	0	3,810
2012	0	4,572	0	4,572
2013	0	4,572	0	4,572
2014	0	4,572	0	4,572
2015	0	4,572	0	4,572
2016	0	4,572	0	4,572
2017	0	4,572	0	4,572
2018	0	4,572	0	4,572
2019	0	4,572	0	4,572
2020	0	4,572	0	4,572
2021(January to February)	0	762	0	762
Total (tonnes of CO_2e)	**0**	**45,720**	**0**	**45,720**

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

B.7.1 Data and parameters monitored:

The following parameter will be monitored during the project activity for Sub Bundle I:

Data / Parameter:	$EG_{BL,y}$
Data unit:	kWh
Description:	It refers to the net electricity supplied by the project activity to the grid
Source of data to be used:	Monthly Generation report by MSEDCL will be used for this variable. The reason is that reading from common meter (Main meter or check meter in case of main meter failure) at substation as well as generation measured at controller end is used by MSEDCL personnel to calculate share of each WTG on pro-rata basis. This data source has been selected because it incorporates transmission loss (line loss) up to substation. Qualifying net electricity sold to grid is derived as per the proportioning procedure mentioned in section B. 7.2 of PDD.
Value of data	-----
Description of measurement methods and procedures to be applied:	Data Type: calculated based on measured parameter. Detail calculation approach is incorporated in section B. 7.2 of PDD. Frequency: Calculated on monthly basis. Archiving Policy: Paper & Electronic Responsibility: State electricity utility is responsible for the proportioning of electricity and provides the net electricity generation report to each WTG owner who supply electricity to grid through common metering system at state utility substation.
QA/QC procedures to be applied:	The electricity in kWh supplied to grid by all the WTG (including project activity) connected to single feeder is measured by metering system (main /check meter) at substation. The meters used will be calibrated periodically by state electricity utility. The proportioning procedure followed by the state electricity utility can be cross verified by cross checking the net electricity supplied value with Joint meter sheet/Energy breakup sheet. The controller end generation of each WTG is continuously recorded & monitored at CMS. The controller end generation & other sensitive parameter monitoring followed can be cross verified at CMS database. The net electricity supplied on the monthly credit/generation report can be cross checked with records for sold electricity (Invoices) However, only the net electricity supplied value as per the monthly credit /generation report provided by state electricity utility is considered for the emission reduction calculations.
Any comment:	Data will be archived during the whole crediting period + 2 years.

The parameters used by the state electricity utility to calculated/derive the net electricity generation by the project activity ($EG_{BL,y}$) are as follows:

Data / Parameter:	$\sum_{0}^{n} EG_{n,y}$
Data unit:	kWh
Description:	The summation of total Electricity Generated (kWh) at the controller from the project activity connected to single common feeder at a substation on a particular site.
Source of data to be used:	Log sheet records in Suzlon database at CMS.
Value of data	----

Description of measurement methods and procedures to be applied:	$EG_{n,y}$ is the sum of electricity generated at controller from project activity continuously measured by controller connected to CMS through SCADA network. State electricity utility used this figure to calculate net electricity generation by the project activity. This will be continuously measured and summarized monthly.
QA/QC procedures to be applied:	The controller end generation of each WTG is continuously recorded & monitored at CMS. The controller end generation & other sensitive parameter monitoring followed can be cross verified at CMS database.
Any comment:	Data will be archived during the whole crediting period + 2 years

Data / Parameter:	$\sum_{0}^{m} EG_{m,y}$
Data unit:	kWh
Description:	The summation of total Electricity Generated at the controller from all the WTGs including project activity connected to single feeder at a particular site.
Source of data to be used:	Log sheet records in Suzlon database at CMS.
Value of data	-----
Description of measurement methods and procedures to be applied:	$EG_{m,y}$ is the sum of electricity generated from all wind turbine (including project activity) continuously measured by controller connected to CMS through SCADA network. State electricity utility used this figure & sum for all WTGs (including project activity) connected to single common feeder. This will be continuously measured and summarized monthly.
QA/QC procedures to be applied:	---
Any comment:	Data will be archived during the whole crediting period + 2 years

Data / Parameter:	$EG_{JMR,export}$
Data unit:	kWh
Description:	Total electricity export by all WTGs (including project activity) connected to single common feeder measured at the respective substation feeder meter.
Source of data to be used:	Joint meter reading sheet/ Energy breakup sheet monitored by state electricity utility through respective feeder meter at substation.
Value of data	
Description of measurement methods and procedures to be applied:	The value of total electricity export from the all WTGs connected to the single common feeder is monitored through main meter & check meter at the substation. Monitoring: tri vector meter will be used for monitoring Data Type: measured parameter. Recording Frequency: measured hourly and recorded monthly Archiving Policy: Paper & Electronic Responsibility: state electricity utility is responsible for regular calibration of the meter. Calibration Frequency: In compliance with PPA (Annually by MSEDCL refer section 11.02 of PPA)
QA/QC procedures to be applied:	Other than main meter, there is check meter to verify the accuracy of main meter. The calibration of the meters will be done by state utility as per the schedule mentioned in PPA. Other than periodic calibration of the meters the reading of both meters, will be matched every month.

Any comment:	Data will be archived during the whole crediting period + 2 years

Data / Parameter:	$EG_{JMR,import}$
Data unit:	kWh
Description:	Total electricity import by all WTGs (including project activity) connected to single common feeder measured at the respective substation feeder meter.
Source of data to be used:	Joint meter reading sheet/ Energy breakup sheet monitored by state electricity utility through respective feeder meter at substation.
Value of data	-----
Description of measurement methods and procedures to be applied:	The value of total electricity import from the all WTGs connected to the single common feeder is monitored through main meter & check meter at the substation. Monitoring: tri vector meter will be used for monitoring Data Type: measured parameter. Recording Frequency: measured hourly and recorded monthly Archiving Policy: Paper & Electronic Responsibility: Respective state electricity utility is responsible for regular calibration of the meter. Calibration Frequency: In compliance with PPA (Annually by MSEDCL refer section 11.05 of PPA)
QA/QC procedures to be applied:	Other than main meter, there is check meter to verify the accuracy of main meter. The calibration of the meters will be done by state utility as per the schedule mentioned in PPA. Other than periodic calibration of the meters the reading of both meters, will be matched every month.
Any comment:	Data will be archived during the whole crediting period + 2 years

The following parameter will be monitored during the project activity for Sub Bundle II:

Data / Parameter:	$EG_{BL,y}$
Data unit:	kWh
Description:	It refers to the net electricity supplied by the project activity to the grid
Source of data to be used:	Monthly GEDA share of electricity certificate will be used for this variable. The reason is that reading from common meter as well as individual meters is used by GEDA personnel to calculate share of each WTG on pro-rata basis. This data source has been selected because it incorporates transmission loss. Qualifying net electricity sold to grid is derived as per the proportioning procedure mentioned in section B. 7.2 of PDD.
Value of data	-----
Description of measurement methods and procedures to be applied:	Data Type: calculated based on measured parameter. Detail calculation approach is incorporated in section B. 7.2 of PDD. Frequency: Calculated on monthly basis. Archiving Policy: Paper & Electronic Responsibility: Respective state electricity utility is responsible for the proportioning of electricity and provides the net electricity generation report to each WTG owner who supply electricity to grid through common metering system at state utility substation.
QA/QC procedures to be applied:	The electricity in kWh supplied to grid by all the WTG (including project activity) connected to single feeder is measured by metering system (main /check meter) at substation. The meters used will be calibrated

	periodically by state electricity utility. The proportioning procedure followed by the state electricity utility can be cross verified by cross checking the net electricity supplied value with Joint meter sheet/Energy breakup sheet. The controller end generation of each WTG is continuously recorded & monitored at CMS. The controller end generation & other sensitive parameter monitoring followed can be cross verified at CMS database. The net electricity supplied on the monthly credit/generation report can be cross checked with records for sold electricity (Invoices) However, only the net electricity supplied value as per the monthly credit /generation report provided by respective state electricity utility is considered for the emission reduction calculations.
Any comment:	Data will be archived during the whole crediting period + 2 years.

The parameters used by the state electricity utility to calculated/derive the net electricity generation by the project activity ($EG_{BL,y}$) are as follows:

Data / Parameter:	$\sum_{0}^{n} EG_{n,y}$
Data unit:	kWh
Description:	The summation of total Electricity Generated (kWh) at the controller from the project activity connected to single common feeder at a substation on a particular site.
Source of data to be used:	Log sheet records in Suzlon database at CMS.
Value of data	----
Description of measurement methods and procedures to be applied:	$EG_{n,y}$ is the sum of electricity generated at controller from project activity continuously measured by controller connected to CMS through SCADA network. State electricity utility used this figure to calculate net electricity generation by the project activity. This will be continuously measured and summarized monthly.
QA/QC procedures to be applied:	The controller end generation of each WTG is continuously recorded & monitored at CMS. The controller end generation & other sensitive parameter monitoring followed can be cross verified at CMS database.
Any comment:	Data will be archived during the whole crediting period + 2 years

Data / Parameter:	$\sum_{0}^{m} EG_{m,y}$
Data unit:	kWh
Description:	The summation of total Electricity Generated at the controller from all the WTGs including project activity connected to single feeder at a particular site.
Source of data to be used:	Log sheet records in Suzlon database at CMS.
Value of data	-----
Description of measurement methods and procedures to be applied:	$EG_{m,y}$ is the sum of electricity generated from all wind turbine (including project activity) continuously measured by controller connected to CMS through SCADA network. State electricity utility used this figure & sum for all WTGs (including project activity) connected to single common feeder. This will be continuously measured and summarized monthly.
QA/QC procedures to be applied:	---

Any comment:	Data will be archived during the whole crediting period + 2 years

Data / Parameter:	$EG_{JMR,export}$
Data unit:	kWh
Description:	Total electricity export by all WTGs (including project activity) connected to single common feeder measured at the respective substation feeder meter.
Source of data to be used:	Joint meter reading sheet/ Energy breakup sheet monitored by state electricity utility through respective feeder meter at substation.
Value of data	
Description of measurement methods and procedures to be applied:	The value of total electricity export from the all WTGs connected to the single common feeder is monitored through main meter & check meter at the substation. Monitoring: tri vector meter will be used for monitoring Data Type: measured parameter. Recording Frequency: measured hourly and recorded monthly Archiving Policy: Paper & Electronic Responsibility: Respective state electricity utility is responsible for regular calibration of the meter. Calibration Frequency: In compliance with PPA (Six monthly by GUVNL/GETCO, refer section 7.1 & 5.0 of PPA)
QA/QC procedures to be applied:	Other than main meter, there is check meter to verify the accuracy of main meter. The calibration of the meters will be done by state utility as per the schedule mentioned in PPA. Other than periodic calibration of the meters the reading of both meters, will be matched every month.
Any comment:	Data will be archived during the whole crediting period + 2 years

Data / Parameter:	$EG_{JMR,import}$
Data unit:	kWh
Description:	Total electricity import by all WTGs (including project activity) connected to single common feeder measured at the respective substation feeder meter.
Source of data to be used:	Joint meter reading sheet/ Energy breakup sheet monitored by state electricity utility through respective feeder meter at substation.
Value of data	-----
Description of measurement methods and procedures to be applied:	The value of total electricity import from the all WTGs connected to the single common feeder is monitored through main meter & check meter at the substation. Monitoring: tri vector meter will be used for monitoring Data Type: measured parameter. Recording Frequency: measured hourly and recorded monthly Archiving Policy: Paper & Electronic Responsibility: Respective state electricity utility is responsible for regular calibration of the meter. Calibration Frequency: In compliance with PPA (Six monthly by GUVNL/GETCO, refer section 7.1 & 5.0 of PPA)
QA/QC procedures to be applied:	Other than main meter, there is check meter to verify the accuracy of main meter. The calibration of the meters will be done by state utility as per the schedule mentioned in PPA. Other than periodic calibration of the meters the reading of both meters, will be matched every month.
Any comment:	Data will be archived during the whole crediting period + 2 years

B.7.2 Description of the monitoring plan:

The methodology requires monitoring of the following parameters:

For the project activity, to establish creditable emission reduction, it has to record the actual electricity supplied to the grid (i.e the net electricity = $EG_{BL,y}$), which would displace equivalent units of electricity at the operating and build margin of the grid. Since the simple OM emission factor is calculated based on a 3 year average, based on the most recent statistics available at the time of PDD preparation, its updation based on post monitoring is not required. For BM calculation, option 1 'Tool to calculate the emission factor for an electricity system (Version 1.1, EB 35) has been chosen, which is calculated ex ante based on the most recent information, hence its monitoring is also not required. Thus, under the monitoring protocol for the said project, it is required to monitor and record only the net electricity supplied to the grid i.e $EG_{BL,y}$; calculated based on the measured parameter by respective state electricity utility.

Although it is being anticipated that there would be no unintended emissions/leakages from this project, however, if any such condition arises, and leakage effect is found due to the project, such leakage will be accounted accordingly as mentioned in the chosen applied baseline methodology.

The project participant signed an operation and maintenance agreement with the supplier of the wind turbines i.e. Suzlon. The agreement is for a period of 2 years. The performance of the turbines, safety in operation and scheduled /breakdown maintenances is responsibility of Suzlon and are organized and monitored by them. So the authority and responsibility of project management lies with the O & M contractor.

SEL is an ISO 9001, 14001 and OHSAS 18001 Certified organization & follows all training & other documentation procedures. Suzlon, who is responsible for monitoring and O & M of the project. Training is an essential part of the ISO system. To comply with the ISO standard the training has to be provided to personnel according to their responsibility within organization.

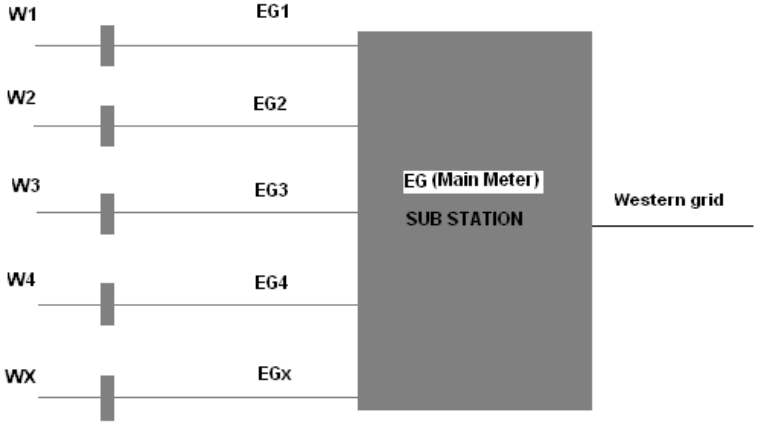
The organizational hierarchy of Suzlon for O& M management is as follows –

Designation	Responsibilities[14]
Project Head	▪ Overall performance monitoring ▪ Project execution
Project Executer and Controller	▪ Operation ▪ Verification of data ▪ Site visit to check authenticity of data and take corrective action, wherever necessary ▪ Storage of data
Site Main Controller	▪ Operation, monitoring and verification of data ▪ Data recording ▪ Storage of data
Operation and Maintenance Contractor	▪ Operation and maintenance ▪ Data recording ▪ Storage of data

Description of net electricity generation for individual WTG calculation/proportioning procedure

[14] The responsibilities are shared between WPPL & Suzlon.

An energy meter (main and check meter) at each substation is connected to a number of wind turbines. The total electricity generation reading is collectively displayed by the substation meter. The net electricity generation for individual WTG is then calculated in the following manner:



The generated electricity is measured through a two step procedure wherein the first monitoring at CMS is carried out at the controller of the machine.. The monitoring of all WTGs is done from a common monitoring station at wind farm site. $EG_{n,y}$ is the electricity generated from an individual wind turbine measured through its controller in the control panel. The summation of total Electricity Generated (kWh) from all the wind turbines of the project proponent at a particular site is presented as

$$\sum_{0}^{n} EG_{n,y}$$

And the summation of total Electricity Generated (kWh) at controller end from all the wind turbines connected to the common single meter at particular feeder as measured

$$\sum_{0}^{m} EG_{m,y}$$

A ratio based on these two set of measured values is used for proportioning the net electricity supplied to the grid by the project activity. The second monitoring is carried out at grid interconnection point at sub station, wherein the Joint Meter Reading (JMR) is carried out, usually in the first week of every month, in presence of both the representatives of the project proponent & the state electricity utility. This JMR is used for calculation of the net electricity supplied to the grid against which the utility makes the payment to the project proponent. The JMR gives both the values of "export" ($EG_{JMR, export}$) and "import" ($EG_{JMR, import}$) for the electricity to/ from the grid. From these two values, $\mathbf{EG}_{(Main\ Meter\ reading)}$ is calculated by deducting $EG_{JMR, import}$ from $EG_{JMR, export.}$ This $EG_{(Main\ Meter\ reading)}$ value is then used for calculating net export from individual WTG.

The proportioning of electricity generated and import from the various wind turbines including project activity is done by the respective state electricity utility based on the $EG_{n,y}$, $EG_{m,y}$, $EG_{(Main\ Meter\ reading)}$.State electricity utility issues monthly net electricity generation/ credit report to each PP. Based on this value PP will raise the invoice against sale of electricity. However, the net electricity generation value as per the net electricity generation report/credit report is considered for the emission reduction calculation.

$EG_{BL,y}$ the electricity generation by the project activity is calculated as follows:

$$EG_{BL,y} = \frac{\sum_{0}^{n} EG_{n,y} \; * \; \text{EG}_{\text{(Main Meter reading)}}}{\sum_{0}^{m} EG_{m,y}}$$

Where

$EG_{BL,y}$	Net generation from all the WTGs of the promoter at a particular site.
$\sum_{0}^{n} EG_{n,y}$	The summation of total Electricity Generated (kWh) at the controller from the project activity connected to single common feeder at a substation on a particular site.
$EG_{(\text{Main Meter reading})}$	Total net generation from all wind turbines at the common metering point as calculated by $EG_{JMR,export}$ - $EG_{JMR,import}$ at the substation feeder.
$\sum_{0}^{m} EG_{m,y}$	The summation of total Electricity Generated at the controller from all the WTGs including project activity connected to single feeder at a particular site.

This procedure will be applicable for all the wind turbines of the PP connected to a particular feeder of the substation. The net export to grid from the project activity will be the summation of net export of individual wind mills of the promoter.

The responsibility of calibration, periodical testing, sealing and maintenance of meters is with the respective state utilities. This is done in the presence of representatives of the promoter. The frequency of meter testing is annual or as decided by the state utility. All meters are tested only at the Metering Point. Additionally, each wind turbine is equipped with an integrated electronic meter. The electricity generated is recorded by the O & M staff of the WTG supplier on 24 hour basis.

Each WTG control panel is equipped with an microprocessor based integrated meter. The Panel meter at controller end is consist of the SCS Controller is also a micro-processor based intelligent controller which has been specially designed for control of wind turbines. 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, kVAh, 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. Moreover, turbine can not run without this relay hence it can not be removed for calibration during operation.

Routine Maintenance Services:

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

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

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

Management Services:

a) Data logging in for power generation, grid availability, machine availability.
b) Preparation and submission of monthly performance report in agreed format.
c) Taking monthly meter reading jointly with utility of power generated at Wind Farm 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:

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

The project activity essentially involves generation of electricity from wind, the employed WTGs can only convert wind energy into electrical energy and cannot use any other input fuel for electricity generation. As the operation of WTGs is emission free and no emissions are produced during the lifetime of the WTGs.

Although it is being anticipated that there would be no unintended emissions/leakages from this project, however, if any such condition arises, and leakage effect is found due to the project, such leakage will be accounted accordingly as mentioned in the chosen applied baseline methodology.

- The proposed project activity requires evacuation facilities for sale to grid and the evacuation facility is essentially maintained by the state power utility (MSEDCL & GETCO).
- The electricity generation measurements are required by the utility and the investors to assess electricity sales revenue.
- The project activity has therefore envisaged two independent measurements of generated electricity from the wind turbines.
- The primary recording of the electricity fed to the state utility grid will be carried out jointly at the incoming feeder of the state power utility (MSEDCL & GETCO). Turbines for sale to utility will be connected to the feeder.
- The joint measurement will be carried out once in a month in presence of both parties (the developer's representative and officials of the state power utility). Both parties will sign the recorded reading.
- Metering equipment - Metering is carried out through electronic trivector meters required for the project. The main meter and check meter shall be installed and owned by MSEDCL & GETCO. The metering equipments are maintained in accordance with electricity standards.
- Meter readings - The monthly meter readings (both main and check meters) at the project site and the receiving station shall be taken simultaneously and jointly by the parties on a pre-determined day of the following month. At the conclusion of each meter reading an appointed representative of the MSEDCL & GETCO and the company signs a document indicating the number of kWh supplied to the grid.
- The secondary monitoring, which will provide a backup (fail-safe measure) in case the primary monitoring is not carried out, would be done at the individual WTGs. Each WTG is equipped with an integrated electronic meter. These meters are connected to the Central Monitoring Station (CMS) of the entire wind farm through a wireless Radio Frequency (RF)

network (SCADA). The generation data of individual machine can be monitored as a real-time entity at CMS.

All the relevant data & reports for maintaining accuracy in future monitoring and reporting of GHGs emission reductions is with the Suzlon on behalf of project participant, which follows Quality Management System (QMS) procedure as per ISO 9001 and is ISO certified organization.

Project promoters have appointed a full time project in-charge to manage the overall project activity after commissioning. The project in-charge supervises the functioning of the wind farm in close coordination with the officials & technical personnel of Suzlon Energy Limited (SEL).

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 and Monitoring methodology – 10/09/2008.
Name and other details of the responsible person are as follows –

Mr. Ajay Jadhav
Managing Director
M/s Western Precicast Pvt. Ltd.
Gat No. 170, Near Kupwad M.I.D.C., Village-Savali, Taluka- Miraj
Sangli, Maharashtra-416410
Tel.: +91 233-2645133, 2644102/3
Fax: +91 233-2644612
E-mail: jsons.accounts@gmail.com

M/s. Western Precicast Pvt. Ltd. is the project participant; please refer Annex 1 of this document for contact details.

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:

03/08/2007 (based on purchase order issued to Suzlon)

C.1.2 Expected operational lifetime of the project activity:

20 Years 0 months

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

C.2.1 Renewable crediting period

Not opted for.

C.2.1.1 Starting date of the first crediting period:

Not applicable

C.2.1.2 Length of the first crediting period:

Not applicable

C.2.2. Fixed crediting period:

C.2.2.1 Starting date:

01/03/2011 or date of registration with CDM EB whichever is later

C.2.2.2 Length:

10 years and 0 months.

SECTION D. Environmental impacts

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

Wind energy is clean fuel. Wind turbine generator emits no air or water pollution because no fossil fuel combustion is required to generate electricity.

Government of India in its notification dated 14th September, 2006, has directed that "construction of new projects or activities or the expansion or modernization of existing projects or activities listed in the Schedule to the above mentioned notification entailing capacity addition with change in process and or technology shall be undertaken in any part of India only after the prior environmental clearance from the Central Government or as the case may be, by the State Level Environment Impact Assessment Authority, duly constituted by the Central Government".

Hence all new projects or expansion and modernization of existing projects or activities listed in category A and B of the Schedule to the notification has to obtain prior EIA clearance. Wind power projects have not been included in either of the categories thus these projects do not require to undertake environmental clearance prior to their installation.

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:

Project participant identified local communities, farmers, and villagers, as the stakeholders with an interest in the CDM activities. The meeting was conducted for the Gujarat and Maharashtra. Accordingly, Project participant issued a public notice on 21/07/2008 in local news paper to invite respective stakeholders requesting them to attend meeting or depute representatives at Suthri Wind

Park. Similarly project participant has issued invitation letter on 03/12/2008 to attend meeting or depute representatives at Sinnar site:

S.No.	Site	Venue	Date
1.	Gujarat	Village. Moti Sindholi, Dist. Kutch	23/07/2008
2.	Maharashtra	Site: Sinnar, District: Nashik	18/12/2008

The agenda of the meeting was fixed as follows:

- Welcome
- Description of the project
- Queries and responses from the participant and the stakeholders.
- Vote of thanks

The stake holder's view is project participant in its own small way is contributing positively to local economy & development.

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 thro' 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:

Stakeholders raise their doubts about the life span, working technology & impacts of WTGs on the local environment; all these doubts are resolved by the officials/ representatives of the companies.

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

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	M/s Western Precicast Pvt. Ltd.
Street/P. O. Box:	Gat No. 170, Near Kupwad M.I.D.C., Village-Savali, Taluka- Miraj
Building:	
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State/Region:	Maharashtra
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FAX:	+91 233-2644612
E-Mail:	
URL:	
Represented by:	
Title:	Managing Director
Salutation:	Mr.
Last Name:	Jadhav
Middle Name:	--
First Name:	Ajay
Department:	Management
Mobile:	
Direct FAX:	--
Direct tel:	--
Personal E-Mail:	jsons.accounts@gmail.com

WPPL is lead promoter of CDM process for this bundle project activity.

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

- The project has not received any public funding and Official Development Assistance (ODA).
- The project is a unilateral project.

Annex 3

BASELINE INFORMATION

CENTRAL ELECTRICITY AUTHORITY: CO2 BASELINE DATABASE
VERSION : 4.0
DATE : 01 September 2008

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

	2005-06	2006-07	2007-08
NEWNE	0.84	0.82	0.81
South	0.73	0.72	0.72
India	0.81	0.80	0.79

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

	2005-06	2006-07	2007-08
NEWNE	1.02	1.01	1.00
South	1.01	1.00	0.99
India	1.02	1.01	1.00

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

	2005-06	2006-07	2007-08
NEWNE	0.67	0.63	0.60
South	0.71	0.70	0.71
India	0.68	0.65	0.63

Annex 4

MONITORING INFORMATION

Monitoring Plan for Sub bundle I: Maharashtra State (WPPL)

The points given below detail the monitoring plan:

- Electricity generated at controller from project activity is continuously measured by controller connected to CMS through SCADA network. State electricity utility used this figure to calculate net electricity generation by the project activity. This will be continuously measured and summarized monthly.
- The Electronic Meter that is used for monitoring is the Export-Import Energy and is, installed before the grid.
- It is a three phase, four wire Export-Import tri- vector Energy meter.
- The calibration procedure followed requires calibrating the meter (main & check meter) in compliance with PPA schedule set by SEBs.
- MSEDCL is State Electricity Utility Company which functions under Government of Maharashtra (GoM) as per Central Electricity Act & it is responsible for Energy Meter calibration check.
- The import and export of electricity is continuously monitored by the export-import meter and the data is reported on a monthly basis jointly by the project participant and State electricity utility officials.
- This common (main & check meter) meter is located at the delivery/feeding point of generated electricity by WTGs in State electricity utility's substation. On the basis of net electricity supplied to grid PP will raised the monthly invoice. The invoice copy considered as sale of net electricity to grid on the basis of Monthly credit note/electricity generation report for respective WTG. The generation report by state electricity utility for respective WTG value is considered for calculation of emission reductions.

Monitoring Plan for Sub Bundle II: Gujarat State (ADB)

- Electricity generated at controller from project activity is continuously measured by controller connected to CMS through SCADA network. State electricity utility used this figure to calculate net electricity generation by the project activity. This will be continuously measured and summarized monthly.
- The Electronic Meter that is used for monitoring is the Export-Import Energy meter and is, installed before the grid interfacing.
- It is a three phase, four wire, Export-Import tri- vector Energy meter.
- The calibration procedure followed requires calibrating the meter (main & check meter) in compliance with PPA schedule set by SEBs.
- GUVNL/GETCO is State Electricity Utility Company which functions under Government of Gujarat (GoG) as per Central Electricity Act & it is responsible for Energy Meter (main & check meter) calibration check.
- The electricity generation from the wind electric generator (WTG) is supplied to substation where it is measured by a energy meter (main & check meter) for respective WTG which is sealed, calibrated by state electricity utility. This measurement is used proportioning of electricity generation measured at substation (i.e. to derive the net electricity supplied by the WTG to state grid).
- The import and export of electricity is continuously monitored by the export-import meter at substation and the data is recorded on a monthly basis jointly by the project participant representative and State electricity utility officials.

- This common main meter & check meter is located at the delivery/feeding point of wind power in State electricity utility's substation. Hence the net electricity kWh of generated qualifying energy to be supplied will be calculated from the main meter/check meter reading and recorded /archived in paper/electronic.
- In the event when main metering system is fails to measure due to not in service as a result of maintenance, repairs or testing, then backup i.e. check metering system will be used for measurement and the will be considered. From the next measurement calibrated/ tested main meter is considered.
- Meter reading taken jointly at the appointed date and time will be signed by the representatives of the GUVNL, GETCO and power producer. If power producer's representative is not present, then the GETCO shall provide the power producer with signed copy of the meter reading of the common (main/back) metering system as the case maybe. Such meter readings shall be treated as the accurate and final measurement, unless proved otherwise, of the energy supplied to the GUVNL by the power producer for the preceding month for the purpose of payment. (*Article 7.1 of PPA*)
- On the basis of net electricity generation report/ GEDA share of electricity generated certificate, invoice will be raised by project proponent. The Monthly credit note/electricity generation report by state electricity utility for respective WTG value is incorporated for calculating the emission reductions.
- In case, both the main & check meters are found to be beyond permissible limit of error, both the meters shall be calibrated immediately and the correction factor applicable to main meter shall be applied to the energy previously measurement for the purpose of energy account/billing.
- The both the meters (Main & Check meter) is in possession of State electricity utility which sealed each meter box under lock & key as per statutory requirements.

The complete monitoring responsibility is carried out as follows:

- Daily monitoring is in the scope of O & M contractor.
- Monthly monitoring is a joint responsibility of WTG owner & state electricity utility. All evacuation services are provided by State electricity utility to the WTG owner/wind farm developer.