**PROJECT DESIGN DOCUMENT FORM
FOR SMALL-SCALE CDM PROJECT ACTIVITIES (F-CDM-SSC-PDD)
Version 04.1**

PROJECT DESIGN DOCUMENT (PDD)

Title of the project activity	3 MW Wind power project in Madhyapradesh
Version number of the PDD	02
Completion date of the PDD	19/11/2012
Project participant(s)	Kohinoor Hatcheries Pvt Ltd.
Host Party(ies)	India
Sectoral scope(s) and selected methodology(ies)	**Scope** : 01 **Methodology**: AMS-I.D. Version 17
Estimated amount of annual average GHG emission reductions	5,717 tCO_2 /annum

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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Description of the project activity

The purpose of the project activity is to generate clean energy by utilizing velocity of the wind for generation of electricity. The technology adopted in the wind power generation is conversion of kinetic energy into mechanical energy and then converted into electrical energy by the generators. In this process there would be no greenhouse gas emissions or burning of any fossil fuels. Thus, electricity would be generated through sustainable means without causing any negative impact on the environment. Therefore, the technology is environmentally safe and sound.

The project activity is a small scale wind power project consists of two Wind Turbine Generators (WTGs) of 1.5MW capacity each totalling to a capacity of 3MW. The WTG's are located at Barda Barkheda village (Mahuriya), Barod Tehsil, Shajapur District of Madhya Pradesh State. The annual net saleable electricity by this project activity is about 6000 MWh at a PLF of 22.83% and would reduce GHG emissions approximately 5,717 tCO_2 / annum and 40,019 tCO_2 during first crediting period. The power generated from the project activity will be exported to NEWNE grid.

No power generation facility existed at the project site prior to the start of implementation of the project activity.

The scenario existing prior to the start of implementation of the project activity is same as baseline scenario identified for the project activity as described under Sec.B.4.

Contribution to GHG emissions reduction

The electricity generated from the project will displace the grid electricity (a grid mix contributed from different fuel sources) by its equivalent units. Thus, the project activity will be preventing the anthropogenic green house gas (GHG) emissions generated by the fossil fuel(coal, diesel, Furnace oil and gas etc.) based thermal power stations in the grid and will be contributing to sustainable development through conservation of environment.

Contribution of project activity to sustainable development

Ministry of Environment and Forests (MoEF), Government of India, has stipulated the following indicators for sustainable development in the interim approval guidelines for CDM projects:

1. Social well being
2. Economic well being
3. Environmental well being and
4. Technological well being

The project activity contributes to the above indicators in the following manner:

Social well being

The project activity leads to alleviation of poverty by establishing direct and indirect employment benefits during erection of WTGs and for operation and maintenance 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 other activities.

Economic well being

The generation of electricity by the project activity will improve availability of electricity to the State grid.

The project activity provides business opportunity for local stakeholders such as suppliers, manufacturers, contractors etc.

Environmental well being

The project utilizes wind energy for generating electricity which would otherwise been generated through other alternative fuels (most likely fossil fuels) thus, reducing the carbon intensity of the grid

The Project will help in conserving the conventional fossil fuels used for power generation and will help in GHGs emission mitigation as well as mitigation of emission of local pollutants like SOx, NOx, SPM etc., as arises from conventional fossil fuel based power generation.

Technological well being

The technology is environmentally safe and sound as it does not produce greenhouse gases and any toxic or radioactive waste.

A.2. Location of project activity
A.2.1. Host Party(ies)
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India

A.2.2. Region/State/Province etc.
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State : Madhya Pradesh

A.2.3. City/Town/Community etc.
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Site : Mahuriya
Village : Barda Barkheda
Tehsil : Barod
District : Shajapur

A.2.4. Physical/ Geographical location

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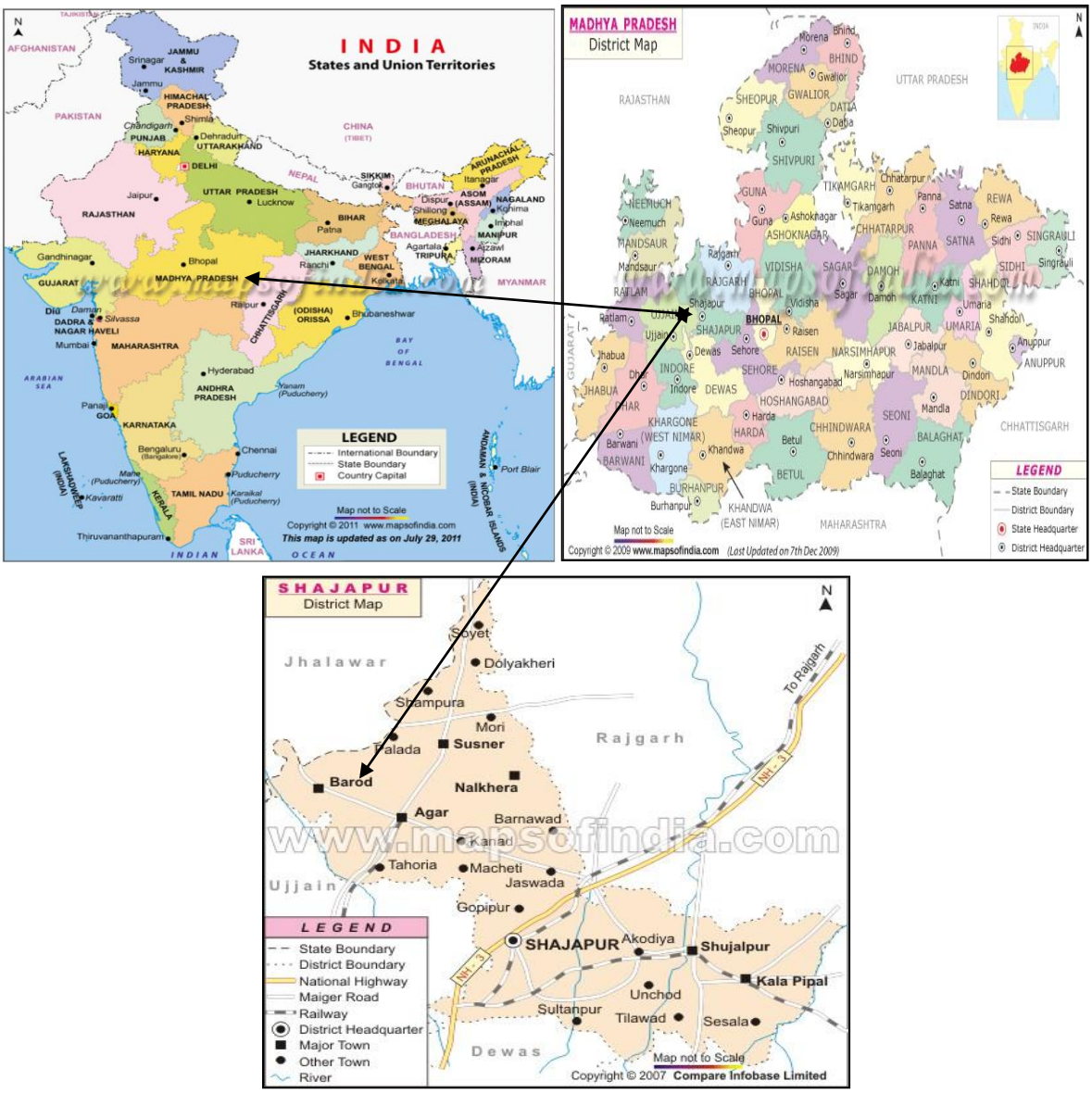
The details of the physical location and unique identification of the project activity are furnished below:

WTG	Location Number	Capacity of turbine	Village Name	Tehsil & District	Geographical Co-ordinates	Date of Commissioning
1	M-38	1.5 MW	Barda-Barkheda	Barod, Shajapur	23°50'27.2"N 76°03'45.9"E	28/03/2011
2	M-48	1.5 MW			23°50'03.5"N 76°04'48.4"E	11/05/2011

Maps depicting location of the project activity are given below:-



A.3. Technologies and/or measures

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Technology:

The Project activity utilizes the velocity of the wind for power generation by installation of Wind Turbine Generators (WTG). A set of turbine blades mounted on a metallic hub to seize power from the up-stream wind this in turn drives the generator to produce electric power. The generator along with its associated components is housed in a common enclosure called Nacelle. The turbine blades and the nacelle are mounted on the tower for better reach to un-obstructed wind. The power captured by the turbine blades is transferred to the generator through the drive train. A gear box is included in the drive train to increase the speed at the generator and of the shaft. A yaw mechanism turns the Nacelle and the rotor assembly to face the wind as it changes its direction. The control panel at the base of Tower monitors various parameters and working condition of WTG on continuous basis.

The technology adopted in the wind power generation is conversion of kinetic energy into mechanical energy and then converted into electrical energy by the generators. In this process there would be no greenhouse gas emissions or burning of any fossil fuels. Thus, electricity would be generated through sustainable means without causing any negative impact on the environment. Therefore, the technology is environmentally safe and sound.

The annual estimate of power export to the grid system would be around 6000 MWh.

The technology of wind power is established in India and the WTG installed at the project activity is indigenous and hence it does not involve any technology transfer.

Technical details of the project activity:

Technical specifications of Suzlon S82 (1500 kW) wind turbine generator is furnished below:-

Rotor	
Type	3 Blades, Upwind/horizontal axis
Diameter	82m
Rotational Direction	Clockwise
Swept area	5281 m2
Hub Height	78.5m
Regulation	Active pitch regulated
Operational Data	
Cut-in wind speed	4 m/s
Rated wind speed	14 m/s
Cut-out wind speed	20 m/s
Gear Box	
Type	Integrated 3 stage 1 planetry & 2 helical
Gear Ratio	1:95:09
Manufacturer	Winergy/ Hansen
Nominal Speed	1650 kW
Generator	
Type	Asynchronous 4 pole
Rotation speed	1511 RPM

Rated output	1500 kW
Rated voltage	690 V
Frequency	50 Hz
Cooling system	Air Cooled
Operational Brakes	
Aerodynamic Brakes	3 independent systems with blades pitching
Mechanical Brakes	Hydraulic disc brakes
Yaw Drive	
Method of Operation	Active electrical yaw motor
Bearing type	Polyamide slide

A.4. Parties and project participants

Party involved (host) indicates a host Party	**Private and/or public entity(ies) project participants (as applicable)**	**Indicate if the Party involved wishes to be considered as project participant (Yes/No)**
Party A (host) India	Private entity A Kohinoor Hatcheries Pvt. Ltd. Public entity A Nil	No

A.5. Public funding of project activity

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There is no involvement of public funding in the project activity from the parties included in Annex I to the convention.

A.6. Debundling for project activity

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According to EB 54, Annex 13, a proposed small-scale project activity shall be deemed to be a debundled 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:

(a) With the same project participants;

(b) In the same project category and technology/measure; and

(c) Registered within the previous 2 years; and

(d) Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point.

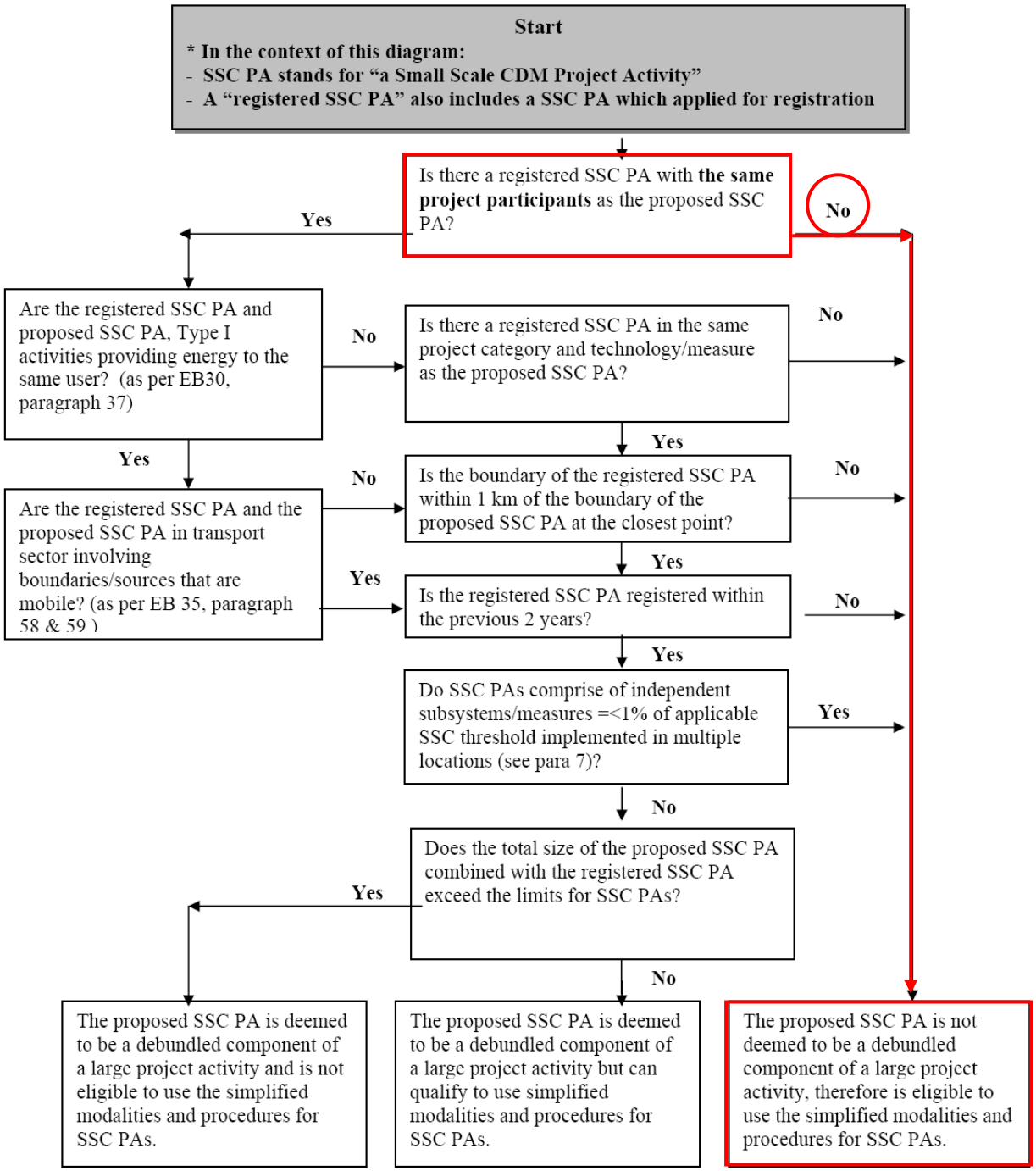
The project proponent hereby confirms that :

- The project activity is a new project and is not a debundled component of another larger project activity.

- Neither registered nor made application to register another small-scale CDM project activity within the previous 2 years whose project boundary is within 1 km of the proposed project activity boundary with same project category and technology /measure.

Diagrammatic representation as per EB 54, Annex 13 "Guidelines on Assessment of Debundling for SSC project activities" is provided below:

I. DETERMINING THE OCCURRENCE OF DEBUNDLING



SECTION B. Application of selected approved baseline and monitoring methodology

B.1. Reference of methodology

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Methodology : AMS-I.D Grid connected renewable electricity generation (Version 17.0)
Tool used : Tool to calculate the emission factor for an electricity system (Version 02.2.1)

B.2. Project activity eligibility

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Requirements with respect to technology/measure under AMS-I.D. – Grid connected renewable electricity generation (Version 17, EB 61)

1	This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass: (a) Supplying electricity to a national or a regional grid; or (b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.	The project activity is a renewable energy generation unit which uses wind as the source for power generation. (a) Supplies generated electricity to the Northern grid. Hence it fulfills the applicability criteria. (b) Project activity does not supply electricity to an identified consumer, hence not applicable.
2	Illustration of respective situations under which each of the methodology (i.e. AMS-I.D, AMS-I.F and AMS-I.A) applies is included in (Table 2) of AMS-I.D.	Project activity supplies electricity to a Northern grid hence AMS-I.D is applicable. Project activity does not supply electricity to a mini grid system, hence AMS-I.F is not applicable Project does not supply electricity to household users, hence AMS-I.A is not applicable
3	This methodology is applicable to project activities that (a) install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); (b) involve a capacity addition1; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).	The project is an installation of a new 2 x 1.5 MW wind power projects at sites where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant), hence the methodology AMS-I.D. is applicable for this project activity.
4	Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: ➢ The project activity is implemented in an existing reservoir with no change in the volume of reservoir; ➢ The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power	The project activity is a wind power project, hence not applicable.

	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.	
5	If the 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 unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	The project activity is generation of power by installation of 2 x 1.5MW Wind Turbine Generator and it does not involve installation of any non-renewable component.
6	Combined heat and power (co-generation) systems are not eligible under this category.	The project activity does not fall under the category of combined heat and power systems category.
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.	This project activity is a completely new initiative and does not involve addition of capacity with any existing renewable energy generation unit.
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.	This is a completely new initiative and does not seek to retrofit or replace any existing facility of renewable energy generation

The above comparison confirms that the chosen methodology is applicable for this project activity.

B.3. Project boundary

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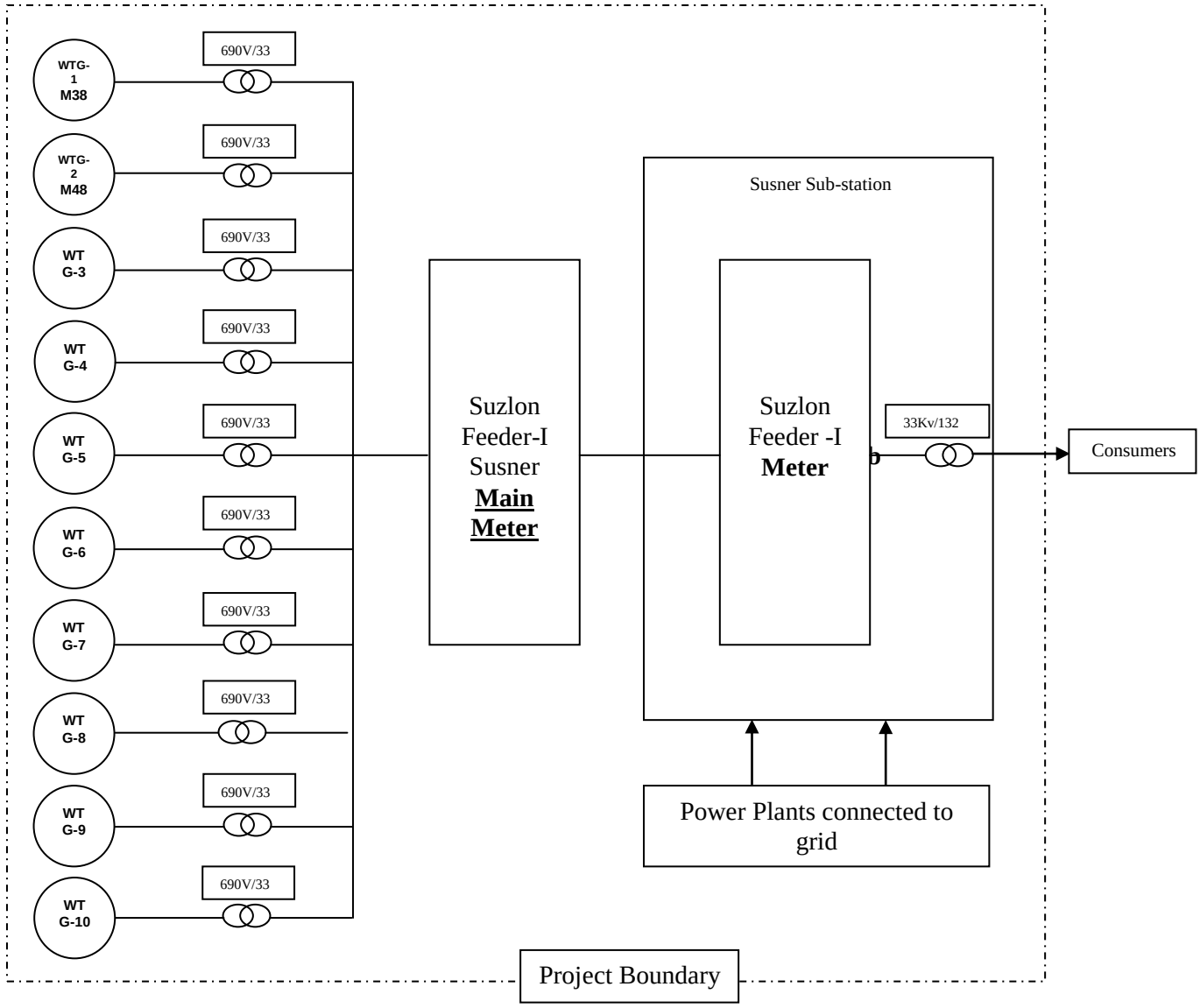
As per Para 9 of indicative simplified baseline and monitoring methodologies for selected small scale CDM project activity categories, AMS-I.D. Version 17, Sectoral Scope 1, EB 61, the project boundary includes the electricity generation from the project activity located at Barda Barkheda Village, Shajapur district of Madhya Pradesh State in India, Suzlon Feeder-I Susner to which the project activity & other eight project activities connected to and till the evacuation point at interconnecting the project activity with 220/132/33 KV EHV Substation. The project boundary also includes all power plants connected physically to the electricity system that the project power plant is connected to. The project boundary is depicted below:



B.4. Establishment and description of baseline scenario

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The project activity is new, grid connected, renewable energy project utilizing wind as a source. Hence, as per the paragraph 10 of the Methodology, AMS-I.D. Version 17, "the baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid " and as per paragraph 11 & 12 of methodology, "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". 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.

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 as conservative since the grid system in future is expected to become more carbon intensive as the projects planned to establish in the region are mostly thermal energy based. As per the 11th Five Year Plan 2007-12 presented below, the capacity addition targeted for NEWNE grid includes thermal energy to the extent of 70% and Hydro/Wind energy to the extent of 18%. This confirms that the grid system in future is expected to become more carbon intensive.

3. CAPACITY ADDITION DURING 11TH PLAN (AS PER PLANNING COMMISSION TARGET)

Region	Hydro	Thermal				Nuclear	Wind	Total
		Coal	Gas	Diesel	Total			
NORTHERN	7488.0	11280.0	1720.0	0.0	13000.0	440.0	0.0	20928.0
WESTERN	1170.0	16875.0	3335.0	0.0	20210.0	0.0	0.0	21380.0
SOUTHERN	1094.0	9885.0	1001.2	0.0	10886.2	2940.0	0.0	14920.2
EASTERN	3151.0	14060.0	0.0	0.0	14060.0	0.0	0.0	17211.0
N.EASTERN	2724.0	750.0	787.2	0.0	1537.2	0.0	0.0	4261.2
ISLANDS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ALL-INDIA	**15627.0**	**52850.0**	**6843.4**	**0.0**	**59693.4**	**3380.0**	**0.0**	**78700.4***

Source: Power Scenario at a Glance, Page 9 – http://www.cea.nic.in/archives/plg/power_glance/nov10.pdf

The key parameters and data sources are furnished below:

Key Parameter	**Description**	**Data Source**
$EF_{CO2,grid,y}$	CO_2 emission factor of the grid in year *y* (t CO_2/MWh)	CEA published **Baseline Database**" **Version 7.0** grid (CM) http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm
$EG_{BL,y}$	Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year *y* (MWh)	From Plant and Sub-Station Records. Ex-post determination.

The baseline emission factor has been calculated based on combined margin approach considering the data from "**CO_2 Baseline Database**" Version 7.0[1] published by CEA which is available at the time of preparation of the PDD. The CO_2 Baseline Database published by CEA is in accordance with "Tool to Calculate the Emission Factor for an Electricity System".

The combined margin emission factor worked out is 0.95285 tCO_2/MWh.

[1] http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm

Actual emission reductions will be calculated ex-post based on the actual monitored data on energy generation during each year of the crediting period and fixed CEA baseline grid emission factor of 0.95285 tCO_2/MWh.

B.5. Demonstration of additionality

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As per the Guidelines on the demonstration of additionality of small-scale project activities, EB 68, Annex 27the project proponent 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

The project activity chosen investment barrier to demonstrate the additionality

Investment barrier:

The project faces investment barrier due to low return on investment and for this purpose post tax project IRR has been selected as financial indicator. In view of the fact that the proposed project activity involves investment and is financed by a mix of debt and equity, project IRR is the most suited financial indicator for the project type and decision making context. Moreover, since the only credible and realistic alternative to the project is status quo, i.e., grid connected power, the choice of the project proponent is restricted to 'invest or not to invest', the benchmark analysis is the appropriate analysis in conformity with Guidance 19 of Annex 5, EB 62.

The guidance note in annex 5, page No.3, item 12 "Selection and Validation of Appropriate Benchmarks" issued by EB at its 62nd meeting states, "*In case where a benchmark approach is used, the applied benchmark shall be appropriate to the type of IRR calculated. Local commercial lending rates or weighted average cost of capital (WACC) are appropriate benchmarks for a project IRR*". Accordingly, Weighted Average Cost of Capital (WACC) has been worked out, the details of which are furnished below:

The input values available at the time of investment decision which took place on 22/10/2010 are considered for calculation of WACC and investment analysis.

Weighted average cost of capital (WACC) is calculated as weighted average cost of equity and cost of debt as illustrated below:

$WACC = E/V * R_e + D/V * R_d * (1- T_c)$

Where:

R_e = cost of equity
R_d = cost of debt
E = Equity
D = Debt
V = E + D
E/V = percentage of financing that is equity
D/V = percentage of financing that is debt
T_c = Corporate tax rate

Cost of Equity (R_e) :

The real cost of equity of 11.75% as provided in Appendix to the EB 62 Annex 5 "Guidelines on the Assessment of Investment Analysis" for India applicable to the Group I project categories (Energy Industries) is considered. Further as per the said guidelines, the cost of equity (Real term value) has been converted to the nominal value by adding median WPI inflation rate of 6%[2] which is the expected inflation rate over next five years from the start date of the project activity as per the publication "Survey of Professional Forecasters" published by Reserve Bank of India on 05/08/2010. The cost of equity is worked out at 17.75%.

Cost of Debt (R_d) :

Cost of debt is defined as the rate at which lender's agree to lend money to a project. The additionality tool and the guidance to investment analysis clarify that the benchmark for a project with more than one potential developer should not be based on project specific parameters but should represent the standard in the market. Accordingly, the prime lending rate prevailing at the time of investment decision i.e., as on October, 2010 has been considered as the cost of debt. The prime lending rate at the time of investment decision was 12.75%[3] as announced by Indian Overseas Bank on 01/10/2010 at Bombay Stock Exchange website and the same has been considered as the cost of debt. Interest costs are tax deductible; therefore, in order to arrive at the post tax cost of debt, the cost of debt is multiplied with the factor, (1-applicable marginal tax rate i.e., 19.93%). The MAT rate is considered to arrive post-tax cost of debt since as per tax computation statement in the IRR analysis worksheet, the project activity has to pay tax with MAT rate for the first 15 years and the regular tax is payable only from 16th year onwards. Further the repayment of term loan also ends by 11$_{th}$ year and hence MAT rate is considered.

As per the Feasibility Report the debt equity (D/V and E/V) ratio is 75:25. The envisaged Equity (E) is Rs.50.69 million and Debt (D) is Rs.152.07 million.

Considering the inputs as indicated above, the WACC is calculated as under:

WACC = (E/V * Re) + (D/V * Rd) * (1- Tc) =

(25% * 17.75%) + (75% * 12.75%) *(1-19.93%) = 12.09%

The selected benchmark is in conformity with guidance 12 and 13 of Annex 5, EB 62. The WACC calculation is provided in the IRR analysis worksheet.

Computation of Financial Indicator: As mentioned earlier, the project proponent has chosen project IRR to demonstrate additionality. The following are the key input values:

Parameter	Input value	Source
Capacity of the project (MW)	3MW (2 x 1.5MW)	Offer from Suzlon Energy dt.15/10/2010 and Feasibility report
Generation of Power (GWh)	6.0	Offer from Suzlon Energy dt.15/10/2010 and

[2] http://rbidocs.rbi.org.in/rdocs/Publications/PDFs/PRE12T050810.pdf

[3] http://www.bseindia.com/corporates/ann.aspx?curpg=1&annflag=1&dt=20101001&dur=D&dtto=&cat=&scrip=532388

		Feasibility report
Plant Load Factor (%)	22.83%	Computed
Tariff (Rs./kWh)	4.35	Feasibility report and MPERC Tariff Order May-2010.
Cost of the project (Rs.in million)	202.76	Offer from Suzlon Energy dt.15/10/2010 and Feasibility report
Means of Finance (%) - Equity - Debt	 25 75	Feasibility report
O & M Costs (Rs.in million) from 2nd year (incl. Service Tax) Annual escalation	3.75 5%	Offer from Suzlon Energy dt.15/10/2010 and Feasibility report
Insurance charges (Rs.in million)	0.16	Feasibility report supported by quote from Excellent Insurance Broking Services Limited dt.17.10.2010.
Administrative expenses (Rs.in million) Annual escalation	0.3 5%	Feasibility report
Interest on term loan	13.0 %	Term loan sanction letter from Indian Overseas Bank. The interest considered for the purpose of calculation of IRR is based on the sanction letter i.e., the debt acquired by the PP. The same is in conformity with guidance 11 of Annex 5, EB 62
Depreciation	80%	Indian I.T.Act

The project IRR has been worked out for 20 years i.e., for the design life time of the WTG. The project IRR works out to 7.16% in the baseline case and is less than the benchmark of 12.09%. A comparison of the financial indicator and benchmark would reveal that the project is additional.

Sensitivity Analysis: The robustness of the conclusion drawn above, i.e., the project is financially unattractive, has been tested by subjecting critical parameters to reasonable variations. The Guidance on the Assessment of Investment Analysis (Annex 5, EB 62) requires variables which constitute more than 20% of project cost or revenue to reasonable variations. The Guidance also states that +/- 10% variations is reasonable. Accordingly, the variables viz., revenue (generation), project cost, tariff and O&M costs are identified for the analysis.

The outcome of the sensitivity analysis is given below:

Variation %	**-10%**	**0%**	**10%**
PLF	5.42%	7.16%	8.80%
Project cost	8.72%	7.16%	5.84%
Tariff	5.42%	7.16%	8.80%
O & M Cost	7.47%	7.16%	6.86%
Bench Mark	12.09%		
With CDM	10.15%		

The sensitivity analysis proves that the project is unlikely to be financially attractive even under the most unrealistic optimistic conditions of project cost reduces by 10%, generation increases by 10%, tariff increases by 10% and O&M cost coming down by 10%. This proves that the project activity is not a business-as-usual scenario. CDM benefits go to improve the financial attractiveness of the project activity, as evident from the fact that with CDM benefits, the project IRR in the baseline scenario improves to 10.151%. Hence, the project requires CDM benefits to make it financially attractive.

The project IRR reaches the benchmark if the generation goes up by 32% i.e., at a PLF of 30.14%. The WTG supplier has indicated in its offer an estimated generation of 30 lakh units which works out to a PLF of 22.83% which is more than the PLF (20%) considered by MPERC in its tariff order dt. May, 2010. Hence increase in generation by more than the generation anticipated by the WTG supplier throughout the life time of the project is not practical.

The project IRR reaches benchmark only if the cost of project is reduced by 27.09%. At the time of placing purchase order for the WTG, the project proponent has negotiated the price and it has come down to Rs.180.76 million as against the WTG cost estimated at the time of investment decision. The reduction in project cost works out to around 10.85% and with this cost, the IRR works out to 8.87% which is still below the benchmark. As the project is already commissioned with the firmed up cost, further reduction in the project cost is hypothetical.

The power purchase agreement executed by the project proponent with the state utility is for a period of 25 years. The tariff of Rs.4.35/kWh is fixed for project life time and hence the PP is not anticipating any further increase in the tariff.

Further the IRR does not reach the benchmark even if the O & M cost is reduced by 194%. With the country experiencing inflation, reduction in the O&M cost is not likely.

Thus the project justifies the need of CDM funds for the project activity, which will help in improving the project competitiveness and financial sustainability.

Demonstration of prior consideration of the Clean Development Mechanism

As per the Clean Development Mechanism Project Cycle Procedure, Ver.02.0 (EB66, Annex 64) para 7, the project activities with a starting date on or after 02 August 2008 shall notify designated national authority (DNA) of the host party and the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status within 180 days of the start of the project activity by using the "Prior Consideration of CDM Form". As per Glossary of CDM terms, EB66, Annex 63, the start date of the project activity is defined as "the earliest date at which either the implementation or construction or real action of a CDM project activity begins".

The start date of the project activity is 28/12/2010. On this date the project proponent has placed orders for the Wind Turbine Generators, land, erection, installation and commissioning of the WTG, civil works etc., The project proponent has submitted the "Prior Consideration of the CDM Form" duly filled and signed to the Secretariat, UNFCCC and to the Indian DNA vide its letter dt.29/12/2010. This notification is made within six months of the project activity start date, as per Annex 13 EB 62. Thus, the project activity fulfills the conditions stipulated vide Annex 64, Para 7 EB 66.

Further, the chronology of events furnished below evidences continuing and real action was taken to secure CDM status for the project in parallel with its implementation:

Offer for WTG from Suzlon Group	:	15/10/2010
Board Resolution for implementation of the project	:	22/10/2010
Appointment of Consultant for CDM documentation	:	18/11/2010
Purchase order for WTGs (start date of the project)	:	28/12/2010
Prior consideration of CDM Form submitted to UNFCCC & MoEF (Indian DNA)	:	16/02/2011
Stakeholder Consultant process	:	02/02/2011
Commissioning of WTG1	:	28/03/2011
Commissioning of WTG2	:	11/05/2011
Enquiry for DOE	:	22/10/2011
Appointment of DOE	:	05/01/2012
Host Country Approval	:	11/10/2012

B.6. Emission reductions

B.6.1. Explanation of methodological choices

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The project activity is generation of electricity using renewable energy resources and exporting the same to the grid system, which is also fed by other fuel sources such as fossil and non-fossil types. Emission reductions due to the project activity are the difference between baseline emissions and project emissions and leakage. Emission reductions are related to the electricity exported by the project and the actual generation mix in the grid system.

Baseline

As the project activity does not modify or retrofit an existing electricity generation facility, the baseline scenario is electricity delivered to the grid by the project that would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources.

As indicated at Section B.4, the project proponent has selected approach 'a' i.e. combined margin emission factor with ex-ante approach to calculate the baseline emissions.

The baseline emissions are calculated based on the electrical energy baseline expressed in MWh of electricity produced by the renewable generating unit multiplied by an 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)

Central Electricity Authority (CEA) (which is an official source from Ministry of Power, Government of India) have calculated baseline emission factors for various grids in India and made them publicly available by way of "**CO_2 Baseline Database**" **Version 7.0.**

The emission factor of the grid for the ex-ante approach is calculated in the following way:

In accordance with the "Tool to calculate the emission factor for an electricity system, Version 02.2.1" the grid emission factor is calculated using Combined Margin (CM), comprised of an Operating Margin (OM) emission factor and a Build Margin (BM) emission factor. The following procedure was adopted for estimating the grid electricity emission factor:

Step 1. Identify the relevant electricity system.
Step 2. Choose whether to include off-grid power plants in the project electricity system
Step 3. Select a method to determine the operating margin (OM)
Step 4. Calculate the operating margin emission factor according to the selected method.
Step 5. Calculate the build margin (BM) emission factor .
Step 6. Calculate the combined margin (CM) emission factor

Step 1 – Identify the relevant electric power system

The Indian power system is divided into five independent grids, namely new Integrated Northern, Eastern, Western, and North-Eastern regional grid (NEWNE) and the Southern Grid.

NEWNE Grid				**Southern Grid**
Northern	**Eastern**	**Western**	**North-Eastern**	**Southern**
Chandigarh	Bihar	Chattisghar	Arunachal Pradesh	Andhra Pradesh
Delhi	Jharkand	Gujarat	Assam	Karnataka
Haryana	Orissa	Daman & Diu	Manipur	Kerala
Himachal Pradesh	Sikkim	Dadar & Nagar Hyeveli	Meghalaya	Tamilnadu
Jammu and Kashmir	West Bengal	Madhya Pradesh	Mizoram	Pondichery
Punjab	Andaman & Nikobar	Maharashtra	Nagaland	Lakshadweep
Rajasthan		Goa	Tripura	
Uttar Pradesh				
Uttrankhand				

The project activity is located in the State of Madhya Pradesh which comes under Western Grid. Hence, relevant operating and Build margins shall be used for estimation of grid electricity emission factor.

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

Project participants may 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.

Since the data of off-grid power plants is not available, project proponent has considered the CO_2 baseline data base published by CEA which is in accordance with Option I, to calculate operating margin and build margin emission factor.

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

The approved methodological tool recommends the use of one of the following for the calculation of the operating margin emission factor ($EF_{grid,OM,y}$):

a) Simple OM, or

b) Simple adjusted OM; or
c) Dispatch data analysis OM; or
d) Average OM.

According to the methodological tool the Simple OM can 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 2) Based on long-term averages for hydroelectricity production.

As per "**CO_2 Baseline Database**" **Version 7.0** the average share of low-cost /must-run resources (for the five most recent years 2006-07 to 2010-11) amounting to 17.70% which is less than 50% of the grid generation and hence Simple OM method is used to determine operating margin.

The data vintage option selected is the *ex-ante* approach, where a 3 year generation weighted average OM is calculated. The most recent three year data published by CEA on the emission factor of Northern region is considered.

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

The Simple OM is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO_2/MWh) of all generating power plants serving the system, not including low-cost / must-run power plants / units using the CEA[4] data base for the Northern Grid. The calculation is furnished below:-

Operating Margin

Most recent three years	**2008-09**	**2009-10**	**2010-11**
Net Generation (Northern) in operating margin – in MWh	421802632.9	458043084.6	476986721.3
Simple Operating Margin* (OM) in tCO_2 e/ MWh	1.00655	0.97774	0.97066
Three year weighted average Simple Operating Margin (tCO_2/MWh)	0.98421		

* including imports

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

As per the methodological tool, the project participants can choose one of the following two options for calculating build margin:

Option 1: For the first crediting period, calculate the build margin emission factor ex ante based on the most recent information available on units already built for sample group m at the time of CDM-PDD submission to the DOE for validation. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE. For the third crediting period,

[4] Source: CDM Carbon Dioxide Baseline Data base, Version 7.0, January 2012 http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm)

the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period.

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

Option 1 is considered and the Build Margin (BM) for the most recent year published in **CO_2 Baseline Database**, Version 7.0 available at the time of PDD development is furnished below:

Build Margin (BM) – 2010-11	0.85878	tCO_2 / MWh

Source: **CO_2 Baseline Database**, Version 7.0

Step 6 – Calculation the combined margin (CM) emission factor

As per the methodological tool, the calculation of the combined margin (CM) emissions factor ($EF_{grid,CM,y}$) is based on one of the following methods:

(a) Weighted Average CM; or
(b) Simplified CM

The simplified CM method (option b) can only be used if:

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

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

The criteria of simplified CM are not applicable to the project activity, therefore Option (a) is chosen for calculation of Combined Margin (CM) emission factor.

The combined margin emission factor is calculated as the average of the OM and BM emission factors, i.e. the defaults weights for OM and BM are each weighted at 75 % and 25 % respectively. The resulting Combined Margin is fixed ex ante for the duration of the crediting period:

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

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(%)

$EF_{grid,CM,y}$ = 0.98421 x 75% + 0.85878 x 25% = 0.95285 tCO_2 / MWh

Combined Margin (CM)	0.95285 tCO_2 / MWh

Project Emissions (PE_y):

As per AMS-I.D. Version 17, page No.8, para 20, PE_y = 0 for *renewable energy project activities*. The project activity is a small scale wind project which does not involve combustion of fossil fuel and hence emissions due to project activity do not arise.

Leakage calculation (LE_y):

As per AMS-I.D. Version 17, page no. 8, para 22 "*If the energy generating equipment is transferred from another activity, leakage is to be considered*". The energy generating equipment (WTG) installed at the project site is new one and no equipment is transferred from another project activity. Hence as per methodology Leakage (LE_y) = 0

Emission Reductions:

Since the project emissions as well as the leakage are zero, the emission reductions are equal to the baseline emissions. These are calculated based on the monitored net amount of electricity supplied to the grid, and the baseline emission factor.

$ER_y = BE_y - PE_y - LE_y$

B.6.2. Data and parameters fixed ex ante

(Copy this table for each piece of data and parameter.)

Data / Parameter	$EF_{CO2, grid,y}$
Unit	t CO_2/MWh
Description	CO_2 emission factor of the grid in year, *y*
Source of data	CO_2 Baseline Database, Version 7.0 published by Central Electricity Authority (CEA) http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm
Value(s) applied	0.95285
Choice of data or Measurement methods and procedures	In order to facilitate adoption of authentic baseline emissions data and also to ensure uniformity in the calculations of CO_2 emission reductions by CDM project developers, Central Electricity Authority (CEA), Government of India, Ministry of Power has compiled a database containing the necessary data on CO2 emissions for all grid-connected power stations in India. The latest version of CO2 Baseline Database, Version 7.0 available at the time of preparation of PDD is used for calculation of emission factor. Calculated as a weighted average of Operating Margin and Build Margin emission factors as per the "Tool to calculate the emission factor for an electricity system".
Purpose of data	Calculation of baseline emissions
Additional comment	This value is fixed for the first crediting period.

Data / Parameter	$EF_{grid,OM,y}$
Unit	t CO_2/MWh
Description	Operating Margin CO_2 Emission Factor for the project electricity system in year *y* (NEWNE Grid)
Source of data	CO_2 Baseline Database, Version 7.0 published by Central Electricity Authority (CEA) http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm
Value(s) applied	0.98421
Choice of data or Measurement methods and procedures	In order to facilitate adoption of authentic baseline emissions data and also to ensure uniformity in the calculations of CO_2 emission reductions by CDM project developers, Central Electricity Authority (CEA), Government of India, Ministry of Power has compiled a database containing the necessary data on CO2 emissions for all grid-connected power stations in India. The latest version of CO2 Baseline Database, Version 7.0 available at the time of preparation of PDD is used for calculation of emission factor. Most recent 3 years (2008-09, 2009-10, 2010-11) net generation values of NEWNE Grid and Operating Margin (OM) emission factor values have been used to calculate 3 year generation weighted average OM.
Purpose of data	Calculation of baseline emissions
Additional comment	This is fixed for the entire crediting period.

Data / Parameter	$EF_{grid,BM,y}$
Unit	tCO_2/MWh
Description	Build Margin CO_2 Emission Factor for the project electricity system in year y (NEWNE Grid)
Source of data	CO_2 Baseline Database, Version 7.0 published by Central Electricity Authority (CEA) http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm
Value(s) applied	0.85878
Choice of data or Measurement methods and procedures	In order to facilitate adoption of authentic baseline emissions data and also to ensure uniformity in the calculations of CO_2 emission reductions by CDM project developers, Central Electricity Authority (CEA), Government of India, Ministry of Power has compiled a database containing the necessary data on CO2 emissions for all grid-connected power stations in India. The latest version of CO2 Baseline Database, Version 7.0 available at the time of preparation of PDD is used for calculation of emission factor. Build Margin emission factor data (for the year 2010-11) is used for calculation of combined margin emission factor
Purpose of data	Calculation of baseline emissions
Additional comment	This value is fixed for the first crediting period. For the second crediting period, the build margin emission factor will be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE.

B.6.3. Ex-ante calculation of emission reductions

>>

Baseline Emissions (BE_y):

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) = EG_y
$EF_{CO2,grid,y}$ = CO2 Emission Factor in year y (t CO2 /MWh) = EF_y

Therefore,
BE_y = 6000 MWh* 0.95285 tCO_2/MWh

BE_y = 5717.10 tCO_2 per annum or say 5717 tCO_2 per annum

Project emissions:

Being a renewable energy based small scale wind project, emissions from the project activity are not anticipated.

Therefore,
PE_y = 0 tCO_2 per year

Leakage:

No leakage has been identified from the project activity as per the methodology used.
Therefore,

LE_Y= 0 tCO_2 per year

Emission reductions:

$ER_y = BE_y – PE_y – LE_y$

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)

As $LE_y = PE_y = 0$; ER_y = 5717 tCO_2 per year.

Therefore, emission reduction (ER_y) = BE_y = 5717 tCO_2 /year.

B.6.4. Summary of ex-ante estimates of emission reductions

Year	Baseline emissions (tCO_2 e)	Project emissions (tCO_2 e)	Leakage (tCO_2 e)	Emission reductions (tCO_2 e)
01/01/2013 to 31/12/2013	5,717	0	0	5,717
01/01/2014 to 31/12/2014	5,717	0	0	5,717
01/01/2015 to 31/12/2015	5,717	0	0	5,717
01/01/2016 to 31/12/2016	5,717	0	0	5,717
01/01/2017 to 31/12/2017	5,717	0	0	5,717
01/01/2018 to 31/12/2018	5,717	0	0	5,717
01/01/2019 to 31/12/2019	5,717	0	0	5,717
Total	**40,019**	0	0	**40,019**
Total number of crediting years	7 years			
Annual average over the crediting period	**5,717**	**0**	**0**	**5,717**

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

Data / Parameter	$EG_{BL,y}$
Unit	MWh
Description	Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y
Source of data	Monthly report on generation & consumption certified by M.P.Pashchim Kshetra V.V.Co.Ltd., (DISCOM)
Value(s) applied	6,000
Measurement methods and procedures	Monitoring : Tri-vector energy meter installed at Suzlon Feeder-I Data Type : Measured & calculated Recording : Monthly Credit Notes/JMR Reports Archiving Policy : Paper & Electronic Calibration Frequency : Yearly Accuracy : 0.5s class The quantity of net electricity supplied by the project activity to the grid will be calculated as under: Net electricity supplied to grid for given month = Export – import. The detailed procedure for arriving net electricity export to the grid is described at Appendix 5.
Monitoring frequency	Continuous monitoring, monthly recording
QA/QC procedures	The measurement results will be cross checked with records of sold/purchased electricity (e.g. invoices/receipts).
Purpose of data	Calculation of baseline emissions
Additional 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.

Data / Parameter	EG_{WEG}
Unit	MWh
Description	Data of electricity generation captured at WEG Controller during the year *y*
Source of data	Monthly report on generation recorded at CRMS database
Value(s) applied	6000
Measurement methods and procedures	Monitoring : There is a micro-processor based intelligent controller which uses Multi function relay. A software program reads and displays the parameters such as voltage, current, power factor, kVAh, kVArh, and kWh Data Type : Measured Recording : Daily Archiving Policy : Paper & Electronic Calibration Frequency : Calibration of the controller is not possible and not required as it is only a relay which displays the energy generated through a software program.
Monitoring frequency	The energy generated is updated in the controller by the energy counter at a predetermined time slots in a day which is usually kept at 10Min slot. The data will be downloaded by Suzlon team & will be uploaded into CRMS data base which will be relayed to project proponent on daily basis.
QA/QC procedures	The measurement results will be cross checked with records of monthly JMR .
Purpose of data	To arrive net electricity export to the grid by WTG locations M-38 and M-48 and also to arrive electricity export for a particular period in case mismatch of monitoring period with billing cycle occurs.
Additional 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. Sampling plan

>>

No sampling approach required for the parameters monitored in section B.7.1.

B.7.3. Other elements of monitoring plan

>>

The project proponent has purchased Wind Turbine Generator from Suzlon Energy Ltd., As per the purchase order placed for the WTG, Suzlon Energy will operate and maintain the WTGs for the 1st year from the date of commissioning. From 2nd year onwards the project proponent will execute a contract with Suzlon Infrastructure Services (P) Ltd., for Operation and Maintenance of the WTGs. Besides operation and maintenance of the WTG, the scope of the work of Suzlon is as under:

i. Monitoring the functioning of the metering arrangements and getting them calibrated as per the DISCOM norms, so that the accuracy and reliability levels are maintained.

ii. Periodic verifications and onsite inspections to ensure the quality of the data recorded by the personnel.
iii. Ensure monthly recording of the generation particulars by the DISCOM authorities.
iv. Obtaining and archiving the generation certificates properly for aggregation at the required intervals.

The Operational and Management Structure for monitoring emission reductions is furnished below:

Designation	Responsibilities
Managing Director (Project proponent)	Verify the Monthly Joint Meter Reading report which shows Electricity export and electricity import and net electricity supplied to the grid submitted by Site In-charge of respective WTG locations for monitoring of emission reductions.
Site In-charge (O&M Service provider) of WTG Location M-38 and WTG location M-48	The Site In-charges (O&M Service provider) of respective WTG locations, will record monthly energy meter readings jointly with the representatives of M.P.Pashchim Kshetra V.V.Co.Ltd., and submit the Joint Meter Reading statement to the project proponent.

SECTION C. Duration and crediting period
C.1. Duration of project activity
C.1.1. Start date of project activity
>>
28/12/2010 – Date of Purchase order placed for Wind Turbine Generators

C.1.2. Expected operational lifetime of project activity
>>
20 y-0m (Source: Statement of Compliance issued by Germanischer Lloyd Industrial Services GmbH, Germany dt.11.05.2007)

C.2. Crediting period of project activity
C.2.1. Type of crediting period
>>
Renewable crediting period

C.2.2. Start date of crediting period
>>
01/01/2013

C.2.3. Length of crediting period
>>
7 y-0m

SECTION D. Environmental impacts
D.1. Analysis of environmental impacts
>>
The project activity does not fall under the purview of Environmental Impact Assessment notification S.O.1533, dated 14th September 2006 (which is amended vide Notification S.O.1737(E) dt.11th October, 2007, S.O.3067(E) dated 1st December, 2009, S.O.695(E) dt.6th April, 2011 and S.O.156(E) dt.25th

January, 2012) issued by Ministry of Environment and Forests (MoEF), Government of India (GOI) and the project activity is exempted from environmental clearances. Since the project activity is a wind power project of 3 MW capacity it does not cause any negative impacts on the environment or socio-economic situation in the region and does not require any environmental impact analysis.

SECTION E. Local stakeholder consultation

E.1. Solicitation of comments from local stakeholders

>>

The project participant invited stakeholders through personal invitation (by letter) and also by way of notification dt.17.01.2011 which is circulated through grampanchayat office by giving a 15 days time for submission of their suggestions / comments on the project activity and conducted stakeholders meeting on 02.02.2011 at Suzlon's Central Monitoring Station, Mahuriya, Madhya Pradesh state. The meeting was attended by 32members. The notice inviting stakeholders and the minutes of the stakeholder meeting are furnished to the DOE for verification

E.2. Summary of comments received

>>

The stake holders attended to the meeting have expressed their happiness informing that the area has been developed, created employment opportunities to the local villagers in various fields viz., civil construction, transport services, courier, photocopying, printing and fax services etc., after establishment of the wind projects.

The gist of the Queries raised by the stakeholders and the responses given by the project participant are listed below.

S.No	Comment from Stakeholder	Response from Project Participant
1	We were expecting more projects to come here. We feel that Suzlon has put up lesser number of WTG's than it should have, Is it true? what could be reason for this?	Suzlon has not slowed down the process. But others states have, on seeing the popularity of WTG's met with the customers in the market, and the successful; commissioning and implementation of Wind Power Projects and the support given by the state Electricity Boards in this regard, have also come out with equally attractive wind power policies in their states. These have attracted the investors to other states. This is a success of the Concept of Renewable energy.
2	Will the project help in improving the electricity supply to the villagers or the neighbouring areas?	The power generated is transmitted to the state electricity grid. Once the electricity is supplied to the grid then it is upto the state electricity board to decide according to the amount of power at its disposal.
3	Does this project affect the ground water level	No, Wind project does not affect either the ground level or drinking water quality of the area near the project.

E.3. Report on consideration of comments received

>>

There were no specific comments from the stake holders which require immediate action of the project participant. Hence no action was taken.

SECTION F. Approval and authorization

>>

Letter of approval from Indian DNA is received vide its letter dt.11/10/2012.

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Appendix 1: Contact information of project participants

Organization	Kohinoor Hatcheries Pvt.Ltd.
Street/P.O. Box	H.No.8-2-269/S/20, Flat.No. 201, Sagar Society, Road.No.2, Banjara Hills
Building	Sri Chaitanya Residency
City	Hyderabad
State/Region	Andhra Pradesh
Postcode	500 034
Country	India
Telephone	040-23602401 & 040-23602405
Fax	040-23602403
E-mail	khpl@satyam.net.in
Website	---
Contact person	Mr. Raghava Rao
Title	Managing Director
Salutation	Mr.
Last name	Rao
Middle name	Raghava
First name	D
Department	---
Mobile	+91 9966511110
Direct fax	040-23602403
Direct tel.	040-23602401
Personal e-mail	khpl@satyam.net.in

Appendix 2: Affirmation regarding public funding

The project has not utilized any ODA and no public funding is being allied with the project activity

Appendix 3: Applicability of selected methodology

Information on applicability of selected methodology is provided in Section B.1 and B.2.

Appendix 4: Further background information on ex ante calculation of emission reductions

Information on ex ante calculation of emission reductions is provided in B.6.3 section of the PDD.

Appendix 5: Further background information on monitoring plan

The description of the monitoring plan is furnished below:-

The methodology AMS-I.D. Version 17, requires monitoring of "Quantity of net electricity supplied to the grid". The Monthly report certified and issued by M.P.Pashchim Kshetra V.V.Co.Ltd., (DISCOM) shows the import, export and net electricity exported.

Recording procedure:-

The project proponent has executed power purchase agreement with MP Power Trading Co.Ltd., (MP TRADECO) on 23rd July 2011 for export of energy generated from its WTG location Nos.M-38 and M-48. The location of the project activity falls under West DISCOM i.e., M.P.Paschim Kshetra Vidyut Vitaran Co.Ltd., (MPPKVV).

Project proponent has appointed Suzlon Infrastructure Services Limited (SIL) as nodal agency for operation and maintenance of WTGs as well as for dealing with the WEST DISCOM and MP TRADECO.

The project activity connected to Suzlon-I Susner- Along with the project activity (M-38 and M-48) another 8 WTGs (Location No,M-34, M-35, M-36, M-37, M-45, M-46, M-51, M-90) are connected to the same Suzlon-I Susner. A common energy meter (Main) of 0.5s Class having Sl.No.3475741 has been installed at the said feeder to measure and record the electricity exported to the grid and electricity imported from the grid from all the 10 WTGs.

MPPKVV propose to install check meter within 3-4 months i.e., on or before March 2013.

The meter reading will be carried out by MPPKVV (as per para 21 of the PPA). MPPKVV will capture the reading every month on a particular day through the remote link from the common energy meter installed at Suzlon Feeder-I. The reading report will be provided by MPPKVV to SIL team every Month. SIL team will cross verify the data recorded in the report provided by MPPKVV with the readings noted by them.

The controller is part of each WTG and is available at the basement of the tower in the control panel room. The data of generation will be captured at the controller. The energy generated is updated in the controller by the energy counter at a predetermined time slots in a day which is usually kept at 10Min slot. The captured data will be downloaded by SIL team and will be uploaded into CRMS data base which will be relayed to project proponent on daily basis.

The apportioning method to arrive the net electricity exported (in kWh) to the grid by each WTG will be as under:

S.No.	Description
I	Generation recorded at each WTG Controller
II	Sum of generation recorded at 10 WTGs
III	Ratio (III = I/II)
IV	Total export recorded at main meter installed at Suzlon-I Feeder

V	Export of each WTG (V = III * IV)
VI	Total import recorded at main meter installed at Suzlon-I Feeder
VII	Import of each WTG (VII = III * VI)
VIII	Net Export of electricity by each WTG to the grid = Export of each WTG - Import of each WTG (VIII = V – VII)

JMR (Monthly Report on Generation & Compensation 1.5MW x 10 WEGs = 15MW Feeder Suzlon-I Susner-) will be prepared based on this statement and the same will be signed by both MPPKVV and SIL and submit to the individual project proponents.

Procedure for noting energy generation in case of meter fails:-

As described above, at present there is only one common meter installed at Suzlon Feeder –I to measure and record the electricity export and import from 10 WTGs. MPPKVV proposed to install check meter within 3-4 months i.e., on or before March, 2013. Till the check meter installed, if the meter at the feeder level fails, the data can be retrieved from the meter available at Susner substation.

The following procedure will be followed once the check meter is installed.

The consumption recorded by the billing meter holds good for the purpose of billing each month as long as errors in the billing meter and standby / check meter do not exceed permissible limits.

In case in any month the errors in the billing meter or standby / check meter exceed permissible limit, the meter will be tested and calibrated and billing will be done on the basis of the recording of that meter (billing or standby) whose errors are found within limits.

If during test check or annual calibration, billing meter is found to have error beyond permissible limits or errors, but the standby meter is found to have error within permissible limit of error, billing for previous three months shall be revised on the basis of consumption recorded by the standby meter. However billing meter will be calibrated immediately and billing thereafter will be as per consumption recorded by recalibrated billing meter.

If during test check or annual calibration, both billing and standby meters are found to have errors beyond permissible limits, the bill shall be revised for the previous thee months by applying correction factor to the consumption registered by the billing meter. The correction factor shall mean the percentage of error between the standard meter and billing meter.

If both billing meter and standby meters fail to record energy due to any reasons, the energy exported to the grid during the period of outage will be computed as per meter readings of individual meters installed at each WEG, period of run of each WEG, losses, consumption on the auxiliaries, power factor etc.,

All the tests on the billing and standby meter will be conducted by the meter relay testing staff of the DISCOM jointly with the representative of the company and results and corrections so arrived at mutually will be applicable and binding on both the parties.

Procedure for data apportioning in case the dates of the monitoring period do not match with the dates of the billing cycle

In case verification period dates and billing cycle of the WTGs dates do not coincide, the emission reductions of that particular period will be calculated based on the apportioning procedure as described below.

The apportioning of the net exported electricity from the WTG would be done by multiplying the net energy exported as per Monthly report on generation & consumption issued by DISCOM and the ratio of the WTG controller readings of the intervening period. The sample calculation is furnished below:

Generation at WTG Controller (MWh)
(for the intervening period) = A

Total generation at WTG Controller (MWh) = B
(Total generation of particular month)

C = Ratio of A & B = A/B*100

Generation as per Monthly report issued by
DISCOM (MWh) = D

Generation used for calculation of emission reduction
Calculations for the intervening period (MWh) = (D * C/100)

The same procedure will be followed if the mismatch occurs at the end of the crediting period.

Calibration procedure:

Billing meter and standby meter will be calibrated and adjusted once in a year.

Internal Audit:

Internal audit will be conducted for every six months by the authorised representative of the project proponent. The audit includes verification of data as available in monthly report on generation issued and certified by MPPKVV, Monthly reports (CRMS data base) furnished by Suzlon, billed units as per bills raised to MPPKVV and cross checking of payment receipts with monthly reports which will be submitted by Suzlon every month. The internal audit report will be furnished to the board of directors for their review.

QA AND QC PROCEDURES

The project would employ latest state-of-the-art microprocessor based high accuracy of 0.5s metering equipment. Hence, high quality of data monitoring system would be ensured. Sales records would be used and kept for checking consistency of the recorded data. The sales records are basically the invoices raised and the payment received from the utility for power exported to the grid.

DATA STORAGE AND ARCHIVING

All of the above parameters monitored under the monitoring plan would be kept for 2 years after the end of the crediting period or the last issuance of CERs for the project activity, whichever occurs later. The data will be archived electronically and in hard copy and kept in safe storage.

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Appendix 6: Summary of post registration changes

Not applicable as the project is yet to achieve registration status

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History of the document

Version	Date	Nature of revision
04.1	11 April 2012	Editorial revision to change history box by adding EB meeting and annex numbers in the Date column.
04.0	EB 66 13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the project design document form for small-scale CDM project activities" (EB 66, Annex 9).
03	EB 28, Annex 34 15 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.
02	EB 20, Annex 14 08 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>.
01	EB 07, Annex 05 21 January 2003	Initial adoption.
Decision Class: Regulatory **Document Type:** Form **Business Function:** Registration		