Project design document form

(Version 10.1)

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION	
Title of the project activity	The Converging World Renewable Energy India Wind Farm Phase 1
Scale of the project activity	☐ Large-scale ☒ Small-scale
Version number of the PDD	Version 2.0
Completion date of the PDD	22nd January 2019
Project participants	CW Renewable Energy (India) Private Limited The Converging World
Host Party	India
Applied methodologies and standardized baselines	Grid connected renewable electricity generation AMS-I.D. ver. 18
Sectoral scopes linked to the applied methodologies	Sector scope 1 : Energy industries (renewable - / non-renewable sources)
Estimated amount of annual average GHG emission reductions	7,953 tCO2e/year

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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The Converging World is a UK-registered charity with the aim of reducing the impact of climate change as well as reducing inequality and social injustice in the world. As part of its strategy The Converging World (TCW) has decided to construct a wind farm in Tamil Nadu, India, providing non-polluting electricity in a developing country to aid their sustainable development, while helping to reduce global greenhouse gas emissions.

The first phase of The Converging World Renewable Energy India Wind Farm will consist of 2 wind turbines, each of which will have a capacity of 1.5 MW, giving a total capacity of 3 MW. The wind farm is expected to generate approximately 8,399 MWh/year net of own use and losses, which will be supplied to the National grid on the basis of a Power Purchase Agreement (PPA).

In the next few years, TCW is hoping to be able to add further capacity in Tamil Nadu or elsewhere, with a goal of reaching 25.5 MW of installed capacity and 66 GWh/y net generation. If and when TCW is able to consider further investment, this additional capacity will be proposed as a separate CDM project, in order to comply with the requirements of the DNA.

The proposed project activity will generate greenhouse gas (GHG) emission reductions by avoiding CO2 emissions from fossil fuel-fired power plant supplying the national Grid in India. The expected annual reductions, once fully operational, will be 7,953 tCO2e. The southern and NEWNE grids are since synchronised and henceforth referred to as national grid. (CEA database v13.0)

The baseline scenario, therefore, is the same as the scenario existing prior to the implementation of the project activity, i.e. generation of electricity by grid connected power plants. The proposed project activity's two main aims are sustainable development and emission reductions. The project will:
• Generate non-polluting electricity
• Aid sustainable development in Southern India
• Reduce greenhouse gas emissions compared to fossil fuel-fired power plants that supply the Southern India Grid
• Reduce other pollutants resulting from the fossil fuel-fired power plants business-as-usual scenario.
• Help the further growth of the wind power industry in Southern India
• Create local employment opportunity during assembly, installation and operation of the project
• Help stakeholder awareness in the region

The proposed project activity will be built and operated by Suzlon, an experienced wind farm project operator, who also provides the technology.

In addition, after payments to the operator, the revenues from the project will be used to further the sustainable development impact of the project. Some of the surplus revenue from the project activity will be donated to TCW's local partner, the NGO SCAD ("Social Change and Development"), to invest in community development, and re-invested in further low-energy and sustainable development projects

A.2. Location of project activity

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Country: India
State: Tamilnadu
District: Tirunelveli
Village: Kasthurirangapuram village
Taluk: Radhapuram
Turbine R.385 co-ordinates: N8 17.285 E77 46.694
Turbine R.386 co-ordinates: N8 17.735 E77 46.111

A.3. Technologies/measures

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Using the agreed small scale methodology AMS-I.D the category of the project activity is:

Sectoral scope 1: Energy industries
Type I – Renewable Energy Projects
Category I.D. Grid connected renewable electricity generation
The project activity involves the installation of 2 wind turbines, each with a capacity of 1.5 MW, manufactured in India by Suzlon. While Suzlon is an Indian company, its R&D facilities are based in Europe, and it has acquired other technology from the "North".1 The technical design of the wind turbines is highly advanced and reflects current best practice. Some key technology parameters are listed below.

Key technology parameters of the turbine

Key technology parameters	Value
Manufacture	Suzlon
Model	S82
Rotor diameter	82 m
Swept area	5281 m^2
Cut-in wind speed	4 m/s
Rated wind speed	14 m/s
Cut-out wind speed	20 m/s
Hub height of the wind turbines	78.5 m
Capacity	1500 kW

With the wind resource available on site, as established by Suzlon from significant experience at both this location and with the specific technology, each turbine is expected to generate 4.307 million kWh per year (gross). The generated electricity will be supplied to the grid via the 110 kV Tamil Nadu Electricity Board (TNEB) substation.

Time schedule of the implementation of the project

Milestone	Date
CDM discussions with consultant	Jan 2007
CDM development agreement	Jun 2007
First stakeholder meeting	Feb 2008
Publication of PDD for global stakeholder comment	April 2008
First discussions with the DNA for the	May 2008
Equipment contract signed	May 2008
Draft validation report from SGS	Jun 2008
Commissioning of first two turbines & second stakeholder meeting	Aug 2008
DNA approval of the project	Dec 2008

The project scenario is the installation of 2 wind turbines with an aggregate capacity of 3MW. The wind turbines are estimated to generate on average 8,614 MWh of electricity annually (excluding consumption). The power generation is monitored by the electronic control and monitoring system in the project office.

Prior to the implementation of the project activity, the electricity was generated by grid-connected power plants. Without the implementation of the project, this scenario would have continued and is considered the baseline scenario.

A.4. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
India (host Party)	Private entity: CW Renewable Energy (India) Private Limited	No
United Kingdom of Great Britain and Northern Ireland	Private entity: The Converging World	No

A.5. Public funding of project activity

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There is no public funding from Annex I Parties for this Project.

A.6. History of project activity

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PP confirms/declares
1. Confirm that:
   (a) The proposed CDM project activity is neither registered as a CDM project activity nor included as a component project activity (CPA) in a registered CDM programme of activities (PoA);
   (b) The proposed CDM project activity is not a project activity that has been deregistered.
2. Declare that :
   (a) The proposed CDM project activity was not a CPA that has been excluded from a registered CDM PoA;
   (b) There is no registered CDM project activity or a CPA under a registered CDM PoA whose crediting period has or has not expired (hereinafter referred to as former project) exists in the same geographical location as the proposed CDM project activity.

A.7. Debundling

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PP referred to the tool “Assessment of debundling for the small scale project activities” version 4.0. PP confirms that the project is not a debundled component of a larger project activity. There is no registered small-scale CDM project activity or an application to register another small-scale CDM project activity:
• With the same project participants.
• In the same project category and technology/measure.
• Registered within the previous two years.
• Whose project boundary is within one km of the project boundary of the proposed small-scale activity at the closest point.

The proposed project activity is the only one project belongs to the PP in India.

SECTION B. Application of selected methodologies and standardized baselines

B.1. Reference to methodologies and standardized baselines

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AMS.I. D version 18.0 “Grid connected renewable electricity generation”
https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK

Tool to calculate the emission factor for an electricity system version 7.0 (Tool 07)
https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf

Tool “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period” version 3.0.1 (Tool 11)
https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-11-v3.0.1.pdf

B.2. Applicability of methodologies and standardized baselines

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Applicable conditions	Justification by the PP
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 consists of 2 wind turbines, each of which will have a capacity of 1.5 MW, giving a total capacity of 3 MW. The electricity thus generated is supplied to the national grid.
2.Illustration of respective situations under which each of the methodology (i.e. “AMS-I.D.: Grid connected renewable electricity generation”, “AMS-	The electricity generated is supplied to the national grid. Hence AMS.I,D is correct

I.F.: Renewable electricity generation for captive use and mini-grid" and "AMS-I.A.: Electricity generation by the user) applies is included in the appendix (of the applied methodology)	
3.This methodology is applicable to project activities that: (a) Install a Greenfield plant; (b) Involve a capacity addition in (an) existing plant(s); (c) Involve a retrofit of (an) existing plant(s); (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) Involve a replacement of (an) existing plant(s).	The project was installed in a greenfield where there was no power plant prior to installation.
4.Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: (a) The project activity is implemented in an existing reservoir with no change in the volume of reservoir (b) The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the project emissions section, is greater than 4 W/m^2 (c) 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/m^2.	The project consists of wind turbines.
5. If the new unit has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	The installed capacity of the wind power plant (renewable energy) is 3 MW which is less than 15 MW.
6. Combined heat and power (co-generation) systems are not eligible under this category	This is the wind power plant hence not applicable.
7. In the case of project activities that involve the capacity 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 distinct1 from the existing units.	The project was installed in a greenfield where there was no power plant prior to installation. Hence condition is not applicable.
8. In the case of retrofit, rehabilitation or replacement, to qualify as a small-scale project, the total output of the retrofitted, rehabilitated or replacement power plant/unit shall not exceed the limit of 15 MW.	The project was installed in a greenfield where there was no power plant prior to installation. Hence condition is not applicable.
9. In the case of landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered methane emissions are eligible under a relevant Type III category. If the recovered methane is used for electricity generation for supply to a grid then the baseline for the electricity component shall be in accordance with procedure prescribed under this methodology. If the recovered methane is used for heat generation or cogeneration other applicable	The project consists of wind turbines. So condition is not applicable.

Type-I methodologies such as "AMS-I.C.: Thermal energy production with or without electricity" shall be explored.	
10. In case biomass is sourced from dedicated plantations, the applicability criteria in the tool "Project emissions from cultivation of biomass" shall apply.	The project consists of wind turbines. No biomass is used. Condition is not applicable.
11. As per "Tool to calculate the emission factor for an electricity system" v7.0, This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).	The electricity generated from the project substitutes grid electricity that is where the project activity supplies electricity to the grid (national grid). Hence this condition is satisfied.
12. Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants. In the latter case, two sub-options under the step 2 of the tool are available to the project participants, i.e. option IIa and option IIb. If option IIa is chosen, the conditions specified in "Appendix 1: Procedures related to off-grid power generation" should be met. Namely, the total capacity of off-grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity.	The emission factor for the project electricity system is calculated for the grid power plants only as demonstrated in section B.6 of this report.
13. In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	The project is located in India which is not an Annex I country. Hence this emission factor tool can be used for this project.
14. Under this tool, the value applied to the CO2 emission factor of biofuels is zero.	No biofuel is used in this project. Hence condition is not applicable.

B.3. Project boundary, sources and greenhouse gases (GHGs)

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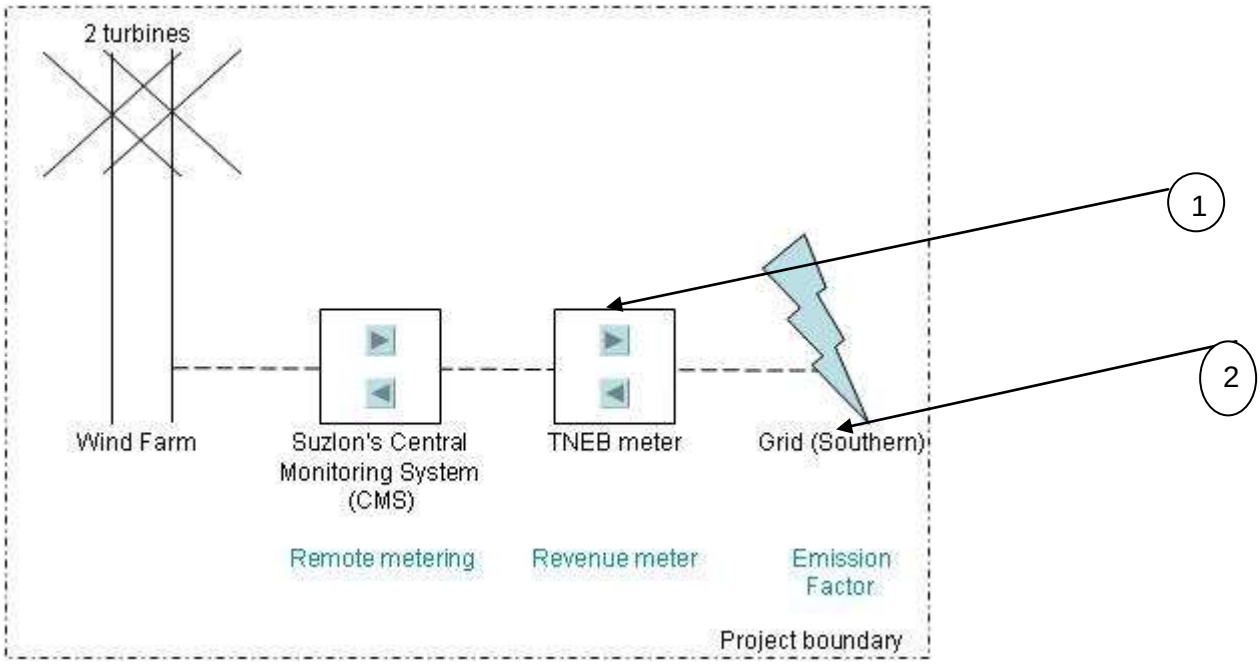
Source		GHG	Included?	Justification/Explanation
Baseline	National grid	CO_2	Yes	Following the methodology
		CH_4	No	Conservative
		N_2O	No	Conservative
Project activity	Fossil fuel	CO_2	Yes	Following the methodology
		CH_4	No	According to the methodology
		N_2O	No	According to the methodology



Electrical diagram

1-$EG_{facility,y}$

2-$EG_{grid,y}$

B.4. Establishment and description of baseline scenario

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PP referred to the "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period" version 03.0.1 for assessing the validity of the current baseline. This tool provides a stepwise procedure to assess the continued validity of the baseline and to update the baseline at the renewal of a crediting period, as required by the Project Standard for project activities v1.0.

The tool stipulates the following steps to be carried out.

Step 1: Assess the validity of the current baseline for the next crediting period

Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies
The Government of India enacted the Electricity Act in the year 2003 to harmonize and rationalize the provisions in the existing laws. The Act consolidated the laws relating to generation, transmission, distribution, trading and use of electricity. With the Enactment of the act, the then existing laws viz, The Indian Electricity Act 1910, The Electricity Supply Act, 1948 and The Electricity Regulatory Commissions Act, 1998 were repealed.

Section 3 of the said act required the Central Government to prepare the national electricity policy and tariff policy, in consultation with the State Governments and the Authority for development of the power system based on optimal utilization of resources such as coal, natural gas, nuclear substances or materials, hydro and renewable sources of energy. In accordance with the section 3 of the Electricity Act 2003, the Central Government notified the National Electricity Policy on 12th February 2005 which was in force at the time of completion of the baseline study of the project activity. This policy has not been revised since then and is currently in force as well.

In addition to the above policies, Indian Renewable Energy Development Agency (IREDA) provides term loan assistance towards establishing biomass power projects. All these fiscal and financial incentives were in force at the time of completion of the baseline of the project activity and still continue to exist.

The state electricity regulatory commission issues tariff order in respect of procurement of power generated wind generators and there is no mandatory national and/or sectoral policies have come into effect that would affect the compliance of the current baseline. Hence, it can be concluded the current baseline complies with all relevant mandatory national and/or sectoral policies that have come into effect after the submission of the project activity for validation and are applicable at the time of requesting renewal of the crediting period. However, in spite of the financial incentives given by the government to renewable power projects in India the generation from the low cost must run resources connected to the national Grid has not increased to such an extent that this would lead to more than 50% contribution (14.6% in 2016-2017) from the low cost must run resources towards the total generation from the national Grid.

The baseline scenario remains unchanged and is in compliance with all the relevant mandatory national and/or sectoral policies as demonstrated in step 1.2.

Step 1.2: Assess the impact of circumstances

The current baseline scenario identified at the validation of the project activity was the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid connected power plants and by the addition of new generation sources into the grid. The project activity is an investment which is not mandated by any law. In the absence of project activity does not lead to any continued baseline practice for PP whereas the continued operation of the project activity would continue to replace grid. Hence, the same baseline as identified in the previous crediting period is still valid for the project. Therefore, the assessment of the changes in market characteristics is not required for the renewal of the project's crediting period under CDM.

Nevertheless, there is an impressive growth attained by the Indian Power Sector within the recent years, the installed capacity has grown from mere 1,713 MW in 1950 to 326,848.54 MW as on 31.03.2017, consisting of 218,329.89 MW Thermal, 57,260.23 MW RES, 44,478.42 MW Hydro and 6,780 MW Nuclear. However, as evident from the below table the installed capacity is predominantly coal based and therefore, is a major source of carbon dioxide emissions in India. Hence, there exists scope for reducing the CO2 emissions in the country by increased use of renewable energy sources. Furthermore, project participant has considered the latest available CO2 Baseline Database (CEA database, version 13) at the time of requesting renewal of the crediting period for establishing the baseline emission factor, which itself considered all the new circumstances. Hence, the new circumstances do not have an impact on the baseline emission. As per below table, the fossil fuel based thermal power generation is dominant over the renewable based power generation, thus baseline scenario remains same as original.

Table 1: Sector- wise installed capacity (MW) as on 31.03.2017 (CEA Database version 13.0)

Sector	Thermal				Nuclear	Hydro	RES	Total
	Coal	Gas	Diesel	Total				
State	64685.50	7257.95	363.93	72307.38	0.00	29683.00	1976.90	103967.28
Central	54335.00	7490.83	0.00	61825.83	6780.00	11651.42	0.00	80257.25
Private	73142.38	10580.60	473.70	84196.68	0.00	3144.00	55283.33	142624.01
All India	192162.88	25329.38	837.63	218329.89	6780.00	44478.42	57260.23	326848.54

Note: These capacities are not identical with those listed in the Excel database, because the database excludes renewable, few small diesel and steam units.

Thus current baseline remains the same and there is no impact of circumstances, existing at the time of requesting renewal of crediting period.

Step 1.3: Assess whether the continuation of the use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested

As explained in step 1.2, the baseline scenario was the electricity import/generation from the power plants connected to the electricity grid. The project activity in green field project and there is no any baseline equipment or investment involved in project activity. Therefore this condition is not applicable to the project activity.

Step 1.4: Assessment of the validity of the data and parameters

This step stipulates that "Where emission factors, values or emission benchmarks are used and determined only once for the crediting period, they should be updated, except if the emission factors, values or emission benchmarks are based on the historical situation at the site of the project activity prior to the implementation of the project and cannot be updated because the historical situation does not exist anymore as a result of the CDM project activity." In the context of the present project activity the emission factor has been updated along with the approach used to calculate the emission factor in section B.6 of this document.

Step 2: Update the current baseline and the data and parameters

As evident from the explanation provided above the baseline scenario remains unchanged. Only the approach used to calculate the baseline emission factor is updated as per the latest version of CEA database (v13.0) available at the time of PDD submission for renewal.

B.5. Demonstration of additionality

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As per para 284 of the Project Standard for Project Activities v1.0, PP need not reassess the additionality nor update the additionality section. Hence PP reproduces the original additionality aspect as specified in the registered PDD.

CDM consideration
The emission reductions are the primary aim, along with encouraging development in the area, of the proposed project activity. The CDM, therefore, had been taken into account prior to the starting date of the project activity, aiming to obtain the investment for the plant on the basis of upfront sales of the reductions.

After initial discussions with the CDM consultant since January 2007, a CDM development contract was signed in June 2007. Due to the unique nature of the project, in particular with regards to the financing of the equity, through upfront sales of the lifetime carbon reductions from the project, the preparatory phase took until the beginning of 2008.

The stakeholder consultation meeting was organised, in conjunction with the NGO SCAD, in February 2008, before the equipment contract was signed in May 2008. A second meeting was held at the time when the two turbines were commissioned in August 2008, and a third meeting in February 2009.

A detailed timeline of the implementation of the project is presented in A.3 of this document.

Additionality
Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities is used to demonstrate and assess the additionality of the proposed project, using the investment barrier.

Investment analysis
The purpose of this step is to determine whether the proposed project activity is not: (a) the most economically or financially attractive; or (b) economically or financially feasible, without the revenue from the sale of certified emission reductions (CERs). To conduct the investment analysis, use the following sub-steps:

Determine appropriate analysis method

Determine whether to apply the simple cost analysis, investment comparison analysis or benchmark analysis (below):
Following the EB guidance on the assessment of investment analysis, if the alternative to the project activity is the supply of electricity from the grid, this is not considered an investment and a benchmark approach is considered appropriate. As the baseline alternative involves the continuation of current practices, supply of electricity from the grid, a benchmark analysis is used to identify whether the project is economically attractive.

Apply benchmark analysis
As The Converging World is a registered charity and not a for-profit company, there is no industry standard for the investment return that can be used. Therefore the benchmark chosen is the loan rate used in the IRR calculations, which is the loan rate achieved for the debt financing. This choice of benchmark is conservative, as equity returns are normally expected to be above the loan rate.

In accordance with EB51 Annex 58 para 12 "local commercial lending rates … are appropriate benchmarks for project IRR". Therefore, the benchmark used is appropriate and in line with the guidance.

In the latest tariff order (Order No 1 of 2009 dated 20-3-2009), the Commission decides that 17.63% pre-tax (which is equivalent to 14% post tax) return on equity may be allowed up to 31-3-2009 and 19.85% pre-tax (which is equivalent to 15.5% post tax) return on equity may be allowed after 31-3-2009.

Therefore, it can be concluded that the benchmark rate used is conservative.

The loan rate is the lowest reasonable benchmark that can be applied for any project, and it is not reasonable to assume that any investment would be made with returns below the loan rate as this does not include any risk premium at all. Therefore, the benchmark is suitable in accordance with VVM v1.2 para 112.

Calculation and comparison of financial indicators:
The data for the financial estimation is presented in the below table. All variables are taken from the Suzlon 1500 kW Feasibility Report, which was the offer from the equipment supplier, and which formed the basis for the decision by TCW to go ahead with the project.

Input values
The IRR calculations are based on the financial estimation for two wind turbines to be installed by Suzlon.

Table. Key data for the financial assessment

Item	Value
Electricity generated per turbine (gross)	4.307 million kWh
Own use and losses	2.5%[5]
Price per turbine	92.50 million IR
O&M	1.35 million IR
Tariff	2.90 IR/kWh
Interest rate	10.3%[6]
Loan term	12 years

Source: Suzlon Financial Analysis, 28 August 2007.

Investment costs
The total investment is based on the feasibility report which was also the offer from the equipment supplier. The analysis estimates the costs at 92.50 million IR per turbine, which is 61.67 million IR per MW installed capacity. Despite being a small scale turn-key contract, this price is within the range quoted by the Centre for Wind Energy Technology (C-WET, a research institution under the Ministry of New and Renewable Energy), which quotes a range of 45 to 68.5 million per MW, and reasonable compared to the range quoted by the Tamil Nadu Energy Development Agency (TEDA), which gives a range of 50 to 60 million IR per MW.

The investment costs are also compared with the values presented by one of the most important wind energy studies in the World, "Wind Energy – The Facts" implemented by a consortium led by the European Wind Energy Association (EWEA) and published in March 2009. According to the study, the investment costs per kW typically varies from around €1000/kW to €1350/kW. The price for the proposed project activity is equivalent to €862/kW. Therefore, it can be concluded that the estimated investment costs in the feasibility report are low.

Tariff
The tariff is set by the TNERC and derived from the latest Tariff Order at the time of the preparation of the financial analysis. Tariff Order No. 3 of 2006, dated 15-5-2006 gives a tariff of 2.90 IR per kWh fixed for the project life time with no escalation in the tariff. The latest Tariff Order (after the feasibility report was done) is "Comprehensive Tariff Order on WIND ENERGY" Order No 1 of 2009 dated 20-3-2009, also confirms that wind mills commissioned between 15-5-2006 and 19-3-2009 shall be eligible for a tariff of Rs.2.90 per unit. The power purchase agreement again confirms the tariff at 2.90 IR/kWh. Therefore, it can be concluded that the tariff in the analysis was correctly estimated.

Generation / plant load factor
In line with EB48 Annex 11, the plant load factor was defined ex-ante and provided to banks and/or equity financiers while applying the project activity for project financing, or to the government while applying the project activity for implementation approval. Therefore, the plant load factor was defined in conformance with EB48 Annex 11 para 3(a). Additionally, the plant load factor was determined by an experienced operator of the same turbine model in the same location.

Gross generation
The expected gross power generation of the proposed project is calculated by Suzlon who already operate the same turbine in the same location, and is based on monthly wind data as presented in section A.4.3 of the PDD. The estimated generation is 4.307 million kWh per turbine per year (on the basis of 100% grid availability and 97% machine availability), which is a gross load factor of 32.78%.

Own use and losses
The own use and losses are taken as 2.5%, which is more conservative than the value in the original analysis which was 10%. The gross generation is estimated on the basis of 100% grid availability and 97% machine availability The TNERC uses grid availability of only 95%, machine availability of only 95%, and internal losses of 2% in its estimation of annual generation.

Additionally, the O&M contract includes a performance guarantee to limit the losses to 5%. Therefore, it can be concluded that the estimate rate of losses is reasonable.

Net generation
After deducting the estimated own use and losses, the net load factor for the project is expected to be 31.96%.The Tamil Nadu Electricity Regulatory Commission adopted a capacity utilization of 27.46% in order No.3 dated 15-5-2006 for new machines based on performance of the machines installed immediately before 15-5-2006. In the latest tariff order (Order No 1 of 2009 dated 20-3-2009), the Commission estimates that capacity utilisation figure of 27.15% for new machines is reasonable.

An independent determination of the plant load factor by Mitcon calculated an average load factor of only 22.73% for turbines in Tirunelveli, Tamil Nadu. Therefore, the net generation and net plant load factor are significantly higher and therefore in terms of the investment analysis, significantly more conservative, than the TNERC estimate applicable for TamilNadu.

Operating costs
The O&M costs are based on the feasibility report which was also the offer from the equipment supplier and operator of the project. The analysis estimates the costs at 1.35 million IR, or 1.46% of investment costs, which is below the range quoted by the Tamil Nadu Energy Development Agency (TEDA), which gives a range of 1.5% to 2%. Therefore, this is conservative. These costs are also compared with the values presented by one of the most important wind energy studies in the World, "Wind Energy – The Facts" implemented by a consortium led by the European Wind Energy Association (EWEA) and published in March 2009. According to the study, O&M costs made up a small percentage (2–3 per cent) of total investment costs for the first two years when they are usually covered by manufacturer's warranty; after six years, the total O&M costs constitute slightly less than 5 per cent of total investment costs."

As a relatively small project it could be expected that O&M costs be relatively high. In addition, the project is carried out on a full service turn-key basis. The O&M contract with Suzlon includes various performance guarantees, including turbine availability guarantees and maximum line loss guarantees, which if exceeded would be bourn or partially bourn by the operator rather than the project participant *Escalation of costs* The Tariff Order No 3 of 2006 states that the O&M costs may escalate by 5% annually, following guidance from MNES. The latest tariff order (Order No 1 of 2009 dated 20-3-2009) confirms the same. Therefore, it can be concluded that the estimated average annual O&M costs and escalation in the feasibility report are reasonable.

Interest rate
The interest rate is taken as the actual achieved rate (10.3%), which is more conservative than the value in the original analysis which was 12%. In the latest tariff order (Order No 1 of 2009 dated 20-3-2009), the Commission states that it considers that an interest rate of 12% is reasonable, given the actual rates available to project developers. Therefore, it can be concluded that the interest rate used is conservative.

Comparison of indicators
Below table shows the result of the IRR calculations of the proposed project activity without and with CER revenue from CDM registration. It can be seen that the IRR without CER revenue is below the benchmark / loan rate and that revenue from the CDM makes the proposed project more financially attractive.

Table Investment **analysis of the proposed project (IRR, post tax)**

	Without CDM	With CDM
IRR (post tax)	9.63%	15.80%

Sensitivity analysis
A sensitivity analysis is used to show whether the conclusion regarding the economic or financial attractiveness is robust to reasonable variations in the critical assumptions. The investment analysis above provides a valid argument in favour of additionality as the sensitivity analysis consistently supports (for a realistic range of assumptions) the conclusion that the project activity is unlikely to be economically or financially attractive.

According to EB guidance, only variables that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variations. For the proposed project activity, the key variable analysed are:
1) Investment cost;
2) O&M cost;
3) On-grid tariff
4) Generation (plant load factor)

In line with EB guidance, the range of variations in the sensitivity analysis covers a range of between –10% and +10%. The result of the sensitivity analysis is presented below.

Table IRR sensitivity analysis for the project

Variation	-10%	0%	+10%
Investment	11.49%	9.63%	8.09%
O&M	9.94%	9.63%	9.32%
Generation	7.60%	9.63%	11.62%
Tariff	7.60%	9.63%	11.62%

The sensitivity analysis shows that without CER revenue the IRR of the project is unlikely to reach the benchmark 10.3%.

Investment: The investment would need to reduce by 3.9% for the project to reach the benchmark. However, it is not possible that investment could be reduced as the basis of the analysis is the actual contract offer for the equipment from the equipment provider. Indeed, the starting date of the project is the date of the equipment purchase contract and therefore the final price was largely known at the start of the project.

Tariff: The project would need to obtain a feed in tariff 3.4% higher than expected to reach the benchmark. However, the tariff is centrally regulated, fixed and published by the Tamil Nadu Electricity Regulatory Commission as Tariff Order No. 3, dated 15-5-2006. Therefore, it was not possible that the tariff would increase. Indeed the tariff was fixed at the level of 2.90 IR/kWh, and has again been confirmed by the later Tariff Order No 1 of 2009 dated 20-3-2009 that wind mills commissioned between 15-5-2006 and 19-3-2009 shall be eligible for a tariff of Rs.2.90 per unit.

Generation / plant load factor: The net generation would need to be more than 3.4% greater than expected to reach the benchmark. However, the estimated load factor in the financial analysis is already higher than

the ranges given in other studies. Also, the estimate is based on long term wind data and actual previous operation by Suzlon in the same area and the same model of turbine, using 100% grid availability and 97% machine availability. Therefore, it is not likely that average net generation over the period would exceed the estimated value.

O&M: The impact of variations in the O&M costs have a limited impact on the project IRR, in order to achieve the benchmark O&M expenditure would need to be dramatically reduced. It is not possible that O&M costs would be reduced by 22% as the basis of the analysis is the actual contract offer from the operator, which was known at the start date of the project activity. Also the O&M costs are already below the normal range of costs according to the regulator.

However, the revenue from the CERs will greatly improve the financial feasibility of the proposed project. Indeed, in the case of this project, the CER revenue is the means for obtaining the equity, with no other source for equity, and without CERs the project would not be possible.

The financial analysis shows that the project is not the most financially/economically attractive alternative, and the sensitivity analysis shows that it is not possible to be financially/economically attractive under reasonable variations in the assumptions.

In conclusion, all the steps above are satisfied, the proposed CDM project activity is not the baseline scenario and is additional.

B.6. Estimation of emission reductions

B.6.1. Explanation of methodological choices

>>

Baseline emissions include only CO2 emissions from electricity generation in power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows

$$BEy = EGPJ,y \times EFgrid,y$$

Where:

BEy -Baseline emissions in year *y* (t CO2)

$EGPJ,y$ -Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year *y* (MWh)

$EFgrid,y$ -Combined margin CO2 emission factor for grid connected power generation in year *y* calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (t CO2/MWh)

Calculation of $EG_{PJ,y}$

The calculation of $EG_{PJ,y}$ is different for greenfield plants, capacity additions, retrofits, and replacements. These cases are described as follows:

Greenfield power plants

If the project activity is the installation of a Greenfield power plant, then:

$$EGPJ,y = EGPJ,facility,y$$

Where

$EG_{PJ,facility,y}$ -Quantity of net electricity generation supplied by the project plant/unit to the grid in year *y* (MWh) = EG_generation,y - EG_consumption,y

EG_generation,y = Capacity x PLF x 8760 =1.5 MW x 32.78% x 8760 = 8614 MWh per year (rounded)

EG_consumption,y = Loss x EG_generation,y = 215 MWh per year

As per the registered PDD, $EGPJ,facility,y$ = 8,399 MWh per year

So $EG_{PJ,y}$ = 8,399 MWh per year

Calculation of $EFgrid,y$

The emission factor shall 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"; (version 7.0) or

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

Step 1: Identify the relevant electricity systems

The project electricity system is defined by the spatial extent of the power plants that are physically connected through transmission and distribution lines to the project activity and that can be dispatched without significant transmission constraints. The grid delineation in Indian is determined by Central Electricity Authority and is accepted by the local DNA. Electricity transfers are accounted for. The baseline calculations by CEA are used in this document. CEA published baseline carbon dioxide emission database for the grid system in India. The calculation of the emission factor of the national grid follows the approach of the "Tool to calculate the emission factor for an electricity system".

The relevant electricity system for this project is national grid as defined by CEA in this database v13.0.

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

PP has chosen option I i.e only grid power plants are included.

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

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

(a) Simple OM; or

(b) Simple adjusted OM; or

(c) Dispatch data analysis OM; or

(d) Average OM.

Simple OM can be used if Low-cost/must-run resources constitute less than 50 per cent of total grid generation (excluding electricity generated by off-grid power plants) in: 1) average of the five most recent years, and the average of the five most recent years shall be determined by using one of the approaches described in the tool.

Simple operating margin (OM):

The operating margin describes the average CO2 intensity of the existing stations in the grid which are most likely to reduce their output if a CDM project supplies electricity to the grid (or reduces consumption of grid electricity). Furthermore, option A has been selected as the required disaggregated data is available in India.

The simple operating margin is the weighted average emissions rate of all generation sources except so-called low-cost or must-run sources. In India, hydro and nuclear stations qualify as low-cost/must-run sources and are excluded. The operating margin, therefore, can be calculated by dividing the grid's total CO2 emissions by the net-generation of all thermal stations. In other words, it represents the weighted average emissions rate of all thermal stations. Values for operating margins given in the CEA user guide v13.0.

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Share of Must-Run (Hydro/ Nuclear) (% of Net Generation)	19.6%	16.9%	18.6%	16.8%	15.1%	14.6%

Hence simple OM method is used.

For the simple OM, the simple adjusted OM and the average OM, the emissions factor can be calculated using either of the two following data vintages:

Ex ante option: If the ex-ante option is chosen, the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required. Or

Ex post option: If the ex post option is chosen, the emission factor is determined for the year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring.

PP has chosen ex ante option for the calculation of OM with 3 years generation weighted average of the most recent years available at the time of submission of CDM-PDD to the DOE for validation. OM determined at validation stage will be the same throughout the crediting period. There will be no requirement to monitor & recalculate the emission factor during the crediting period.

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

The operating margin emission factor has been calculated using a 3 year data vintage:

	2014-15	2015-16	2016-17
Net Generation in Operating Margin (GWh) (incl. Imports)	8,08,417	8,71,753	9,16,278
Simple Operating Margin (tCO2/MWh) (incl. Imports)	0.99	0.97	0.96
Weighted Generation Operating Margin	0.9726981 tCO2/MWh (rounded)		

Source: CEA database v13.0

STEP 5: Calculate the build margin emission factor ($EF_{BM,y}$):

The build margin reflects the average CO2 intensity of newly built power stations that will be (partially) replaced by a CDM project. In accordance with the Grid Tool, the build margin is calculated in this database as the average emissions intensity of the 20% most recent capacity additions in the grid based on net generation. The build margin covers units commissioned in the last five years.

Option 1 as described above is chosen to calculate the build margin emission factor for the project activity. BM is calculated ex-ante based on the most recent information available at the time of submission of PDD and is fixed for the entire crediting period.

	2016-17
Build Margin (tCO2/MWh) (not adjusted for imports)	0.87

Source: CEA database v13.0

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

The combined margin is the weighted average of the simple operating margin and the build margin. In particular, for intermittent and non-dispatchable generation types such as wind, the tool allows to weigh the operating margin and build margin at 75% and 25%, respectively.

Combined margin = 0.9726981* 75% + 0.87* 25% = 0.947 tCO2/MWh (rounded)

$BEy=EGPJ,y\times EFgrid,y$

=8,399 x 0.947
=7,953 tCO2e per year (rounded)

Project Emissions:
For most renewable power generation projects activities PEy =0. As per applied methodology only emission associated with the fossil fuel combustion, emission from operation of geo-thermal power plants due to release of non-condensable gases, emission from water reservoir of Hydro should be accounted for the project emission. Since the project activity is a wind power project, PEy= 0

Leakage Emissions:
No Leakage emissions are considered. The main emission potentially giving rise to leakage in the context of electrical sector projects is emission arising due to activities arising such as power plant construction and upstream emission from fossil fuel use (e.g. extraction, processing, and transport). These emission sources are neglected. No biomass is involved in this project.

Hence, LEy= 0

Emission reduction (ERy):

The project activity mainly reduces carbon dioxide through substitution of grid electricity generation with fossil fuel fired power plant by renewable electricity. The emission reduction ERy by the project activity during a given year y is the difference between Baseline emission and Project emission & Leakage emission.

ERy = BEy - PEy – LEy= 7,953 tCO2e per year

B.6.2. Data and parameters fixed ex ante

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

Data/Parameter	$EF_{grid,y}$
Data unit	CO2e/MWh
Description	CO_2 emission factor of the grid electricity in year *y*
Source of data	CEA database v13.0
Value(s) applied	0.947 tCO2/MWh
Choice of data or measurement methods and procedures	As per the requirements in “Tool to calculate the emission factor for an electricity system” v7.0
Purpose of data	Baseline emissions
Additional comment	CEA database v13.0 is based on Tool to calculate the emission factor for an electricity system. This data will be archived for 2 years beyond the crediting period.

B.6.3. Ex ante calculation of emission reductions

>>
Refer B.6.1 of this document for details.

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

Year	Baseline emissions (t CO_2e)	Project emissions (t CO_2e)	Leakage (t CO_2e)	Emission reductions (t CO_2e)
Year 1	7,953	0	0	7,953
Year 2	7,953	0	0	7,953
Year 3	7,953	0	0	7,953
Year 4	7,953	0	0	7,953
Year 5	7,953	0	0	7,953
Year 6	7,953	0	0	7,953
Year 7	7,953	0	0	7,953

Total	55,671	0	0	55,671
Total number of crediting years	7			
Annual average over the crediting period	7,953	0	0	7,953

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

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

Data/Parameter	$EG_{PJ,facility,y}$
Data unit	MWh per year
Description	Quantity of net electricity supplied by the project plant/unit to the grid in year (y)
Source of data	Suzlon's Central Monitoring System
Value(s) applied	8,399 MWh per year
Measurement methods and procedures	All turbines are connected to the CMA through fibre optic cables/radio modems, allowing continuous monitoring. Meter readings are provided by the utility (TNEB) every month, providing a statement for the previous 30 days per period. Net generation is calculated from exports (generation) minus imports (consumption)
Monitoring frequency	Every month
QA/QC procedures	Cross check by receipt of sales. The Main meter will be calibrated once every two years as per industry practice or during any maintenance.
Purpose of data	Baseline emissions
Additional comment	Generation details are provided on a daily basis by the operator to the PP. Data is uploaded on a website.

Data/Parameter	$EG\_{Generation, y}$
Data unit	MWh per year
Description	Quantity of electricity supplied to the grid by the project in year (y)
Source of data	Suzlon's Central Monitoring System
Value(s) applied	8,614 MWh per year
Measurement methods and procedures	All turbines are connected to the CMS through fibre optic cables/radio modems, allowing continuous monitoring. Meter readings are provided by the utility (TNEB) every month, providing a statement for the previous 30 days per period.
Monitoring frequency	Every month
QA/QC procedures	Cross check by receipt of sales. The Main meter will be calibrated once every two years as per industry practice or during any maintenance.
Purpose of data	Baseline emissions
Additional comment	Generation details are provided on a daily basis by the operator to the PP. Data is uploaded on a website.

Data/Parameter	$EG\_{consumption,y}$
Data unit	MWh per year
Description	Quantity of electricity imported from the grid by the project in year (y)
Source of data	Suzlon's Central Monitoring System
Value(s) applied	215 MWh per year
Measurement methods and procedures	All turbines are connected to the CMS through fibre optic cables/radio modems, allowing continuous monitoring. Meter readings are provided by the utility (TNEB) every month, providing a statement for the previous 30 days per period.

Monitoring frequency	Every month
QA/QC procedures	Cross check by receipt of sales. The Main meter will be calibrated once every two years as per industry practice or during any maintenance.
Purpose of data	Baseline emissions
Additional comment	Generation details are provided on a daily basis by the operator to the PP. Data is uploaded on a website.

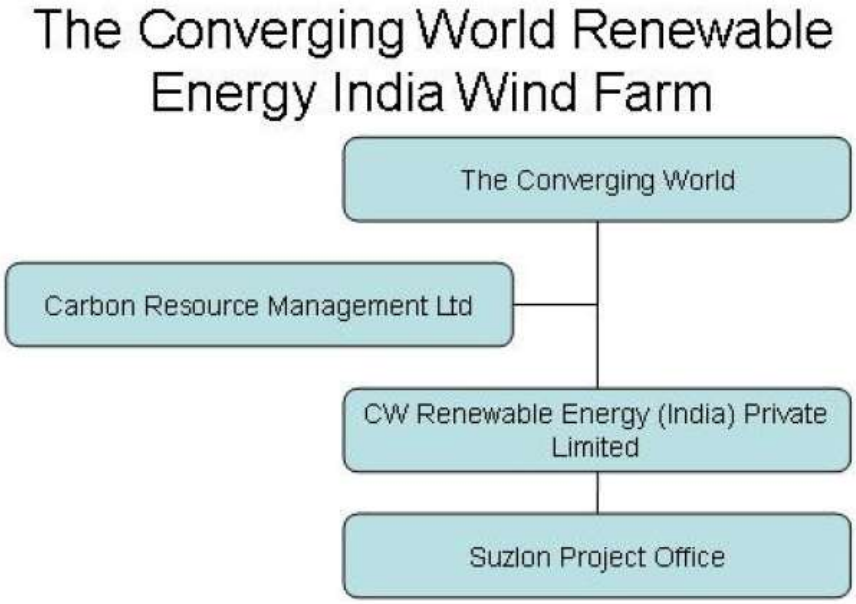
B.7.2. Sampling plan

>>

The operation and maintenance of the proposed project activity is contracted out to Suzlon, who are an experienced operator and developer of wind farms in India.

Suzlon's onsite project office will be responsible for operation and maintenance of the wind farm, as well as the monitoring and reporting requirements of the CDM project**.**

The operating and management structure is illustrated as follows.



B.7.3. Other elements of monitoring plan

>>

Installation of the meter:

The output from each of the turbines will be metered at the onsite project office. Each of the wind turbines is individually connected by fibre optic cable/ radio modem to the Central Monitoring System (CMS), allowing continuous monitoring. The utility (TNEB) records main meter reading every month during 10th to 15th day of the month and provides a statement for the previous 30 day period. The main meter is a trivector meter, recording imports and exports. The meters are of the 0.5 accuracy class i.e having a variation of less than 0.5%.

Calibration:

The main meter is first calibrated on commissioning and then calibrated again once every two years by TNEB, as per industry practice or during any maintenance. The operator, Suzlon, is responsible for the calibration and maintenance of the CMS, which will be calibrated as per industry practice, at least every two years or during any maintenance.

Monitored data

During the operating years, the net electricity supplied to the grid will be monitored and recorded following the procedures above. All data is continuously recorded in the CMS and is uploaded daily to a secure website and emailed to the PP.

Should any previous readings of the main meter be inaccurate by more than the allowable error, or otherwise functioned improperly, the net generation output shall be determined by a) first, by reading check meter, unless a test reveals it is inaccurate b) if the check meter is not with acceptable limits of accuracy or operation is performed improperly the developer and grid company shall jointly prepare an reasonable and conservative estimate of the correct reading, and provide sufficient evidence that this estimation is reasonable and conservative for verification by the DOE; and c) if the grid company and the developer fail to agree then the net generation for this period are taken as zero.

Net electricity supplied to the grid will be double checked with receipt of sales. This audit will check compliance with operational procedures in this monitoring plan. This internal audit will also identify potential improvements to procedures to improve monitoring and reporting in future years.

Physical document such as paper based maps, diagrams and environmental assessments will be collated in a central place, together with this monitoring plan. In order to facilitate auditor's reference of relevant literature relating to the project, the project material and monitoring results will be indexed. All data including calibration records are archived electronically and kept until 2 years after the end of the total crediting period of the CDM project.

SECTION C. Start date, crediting period type and duration

C.1. Start date of project activity

>>
26/05/2008 (date of contract for first turbine)

C.2. Expected operational lifetime of project activity

>>
20 years 0 months.

C.3. Crediting period of project activity

C.3.1. Type of crediting period

>>
Renewable

C.3.2. Start date of crediting period

>>
05/04/2018

C.3.3. Duration of crediting period

>>
7 years

SECTION D. Environmental impacts

D.1. Analysis of environmental impacts

>>

Wind power is one of the cleanest sources of renewable energy, with no associated emissions and waste products. In India, wind power projects do not require an Environmental Impact Assessment. As per the Schedule 1 of Ministry of Environment and Forests (MoEF – Government of India) notification dated 14 September 2006. For details see http://envfor.nic.in/legis/eia/so1533.pdf.

The proposed project does not fall under the list of activities requiring EIA as it will not involve any negative environmental impacts. Additionally, the wind turbines of the proposed project activity are added to an already-existing wind farm site, thus avoiding any impacts on "unspoiled" areas. Therefore no EIA study was conducted. However certain significant impacts are discussed below:

Noise pollution

The wind farm is located in a designated wind zone, and hence is not expected to cause residents of the area any concern.

Flora and fauna

Prior to the establishment of the wind farm, the area was mostly barren land. The impact of the wind farm construction on flora and fauna, therefore, is minimal.

Bird kill in these areas is not a common phenomenon. The wind farm is not in the path of migratory birds. There have been no serious incidents involving birds and wind turbines in the area to the best of our knowledge.

Visual impact

As gathered in the stakeholder analysis, the presence of the wind mills does not have a negative impact on the surrounding villagers in terms of visual impact. The majority of the persons spoken to, were not concerned about the wind mills in the area.

Social Impacts

The social impact of the project is positive. The Project does not displace people nor interfere in their daily life. It provides employment during construction and operation. The Project has also had positive impacts since the infrastructure like roads and communication was developed in the area.

Hence it can be concluded that there are no negative impacts associated with this project.

D.2. Environmental impact assessment

>>

The environmental impacts are not significant.

SECTION E. Local stakeholder consultation

E.1. Modalities for local stakeholder consultation

>>

A total of three stakeholder meetings were held in the villages near the proposed site of the wind farm on 17 February 2008, 23 August 2008 and 6 February 2009. Local, national and international stakeholders were invited to each of the meetings. The local people were invited in person by making site visits prior to the meeting dates.

At the meeting, an introduction to the proposed project and the objective of the stakeholder meeting was given by a representative of The Converging World. A representative of the turbine supplier and operator, Suzlon, answered any technical questions. Questionnaires for the local stakeholders were distributed at the meeting.

E.2. Summary of comments received

>>

First meeting (Chidamparapuram village, 17 February 2008)

All of the returned questionnaires (49) agreed with the construction of the project. 48 stakeholders thinking the overall impact of the project would be positive, and 1 negative. 47 stakeholders assumed there would be economic benefits, mostly jobs, for the local area. However, 27 people responded that the project would have some negative impact on the environment, mentioning mostly noise (22), impact of wildlife (14), and sight spoiling (7).

At the meeting it was mentioned that this was the first opportunity that stakeholders have had to seriously comment on the development of wind farms despite several projects in the area. The stakeholders indicated that they were very happy with this opportunity. Many of the more detailed comments therefore relate as much if not more to these other existing projects rather than the proposed TCW wind farm.

Further comments related to land use, availability of labour, noise, damage to roads, waste from construction and the damage to irrigation canals resulting from the construction and construction traffic.

Second meeting (Mudavankulam village, 23 August 2008)

A number of factors, outside TCW's direct control, influenced the feedback from this second meeting resulting in an unfair representation of local stakeholder sentiment towards the project. These factors are highlighted below:

Location

The village chosen for the first stakeholders meeting (Chidamparapuram) was in line with the project design and corresponding turbine locations initially published by Suzlon. Last minute changes, made by Suzlon, to the location of the first two turbines meant there were communities closer to the actual turbine sites. This meant the second stakeholders meeting was held in a nearby but different location to the first. Further complications around location arose when it became clear that the two turbines - although close together - are actually located in two separate panchayats, only one of which was included in that meeting.

Previous lack of stakeholder consultation around Nagercoil turbine sites

From the feedback gathered by TCW it is clear that local stakeholders have never been given the opportunity to express their views on turbine projects located close to their homes and land. TCW gave local residents the platform to express these views and as a result we received feedback on activities that date back several years, well before the inception of the proposed project.

Land purchase for turbine sites

One issue dominated the feedback at the 2nd stakeholders meeting. It appears there is a high level of dissatisfaction and mistrust towards the wind farm developers from local stakeholders. This is borne out of the perception that local land owners were not paid a full and fair price for their land, purchased to erect wind turbines. This is something that pre-dates the involvement of the project participants in the area. TCW's entire model as an NGO is based around channelling the financial returns from the wind turbine investments back to the originating community through trusted sustainability partners such as SCAD. Therefore there is the opportunity to begin to redress this disparity that still sits so uncomfortably with local stakeholders.

Further problems

This situation was exacerbated by the fact that our meeting was held during the run up to local elections within the village. It was in the interest of certain individuals to voice these concerns in a way that generated popular support at the expense of a clear understanding of how TCW's project is designed to help rather than hinder the local community. For example, once the nature of TCW's project was fully explained, the sentiment began to change and the attendees began to share with us some other issues that it was felt we could help with. It later emerged that some of the local villagers were in need of support with caring for children that had either mental or physical disabilities.

All of these factors combined meant that TCW did not feel it had a true representation of local stakeholder sentiment towards the project at this second meeting. With that in mind we conducted a further meeting, incorporating all of the learning from previous engagements.

Third meeting (Mudavankulam village, 6 February 2009)

44 questionnaires were returned. 33 stakeholders thinking the overall impact of the project would be positive, and 5 negative. 25 stakeholders assumed there would be economic benefits, mostly jobs, for the local area. However, 32 people responded that the project would have both positive and negative impacts on the environment, mentioning mostly noise (23), and sight spoiling (2).

A number of important non-project related issues were discussed that should be prioritised as work for SCAD, including rehabilitation work for disabled children and educational services. 30 participants said they were impressed with the social development activities of SCAD and TCW.

E.3. Consideration of comments received

>>

TCW has responded to the issues raised, aiming to minimise any negative impact and maximise any positive impact on the local area. In particular TCW commits to follow up the stakeholder process with an ongoing opportunity for the villagers to give feedback, through the local liaison team of SCAD.

As a result of the stakeholder consultations TCW has committed to the following:

- ☑ Repair irrigation canals damaged by the construction of the proposed project. This was raised as one of the major issues, and has been acted on immediately after the construction of the turbines. TCW employed a team of local residents to check and repair any damage to the irrigation canals.
- ☑ Appropriate collection and disposal of all construction waste from the project. This was raised as one of the major issues, and has been acted on immediately after the construction of the turbines. TCW employed a team of local residents to clean away the plastic waste left behind by the construction team.
- ☑ TCW will liaise with the local community to determine the best use of the land on which the wind farm is constructed.
- ☑ TCW will investigate the impact of the proposed project on the availability of agricultural labourers.
- ☑ None of the turbines will be constructed within 500m of the nearest residence.
- ☑ Through SCAD continue to give stakeholders an opportunity for feedback on any issues related to the proposed wind farm, including through further stakeholder meetings.
- ☑ Restore habitat around the turbines.

In addition, TCW has already responded to the request by the stakeholders for support with caring for children with mental or physical disabilities. The project participants send a team of carers and advisors to begin a community programme to help the children and their parents/carers. Work has already begun to establish the number of children and adults affected and the nature of the disabilities that require treatment.

SECTION F. Approval and authorization

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LoA already available at the CDM website

Appendix 1. Contact information of project participants

Organization name	CW Renewable Energy (India) Private Limited
Country	India
Address	Old no 72/3, New No 18/3, Vepery, Chennai, Tamilnadu
Telephone	+91 44 25387151/25384598
Fax	+91 44 25387151
E-mail	johnpontin@theconvergingworld.org
Website	-
Contact person	Mr. John Pontin

Organization name	The Converging World
Country	UK
Address	No 70 Prince Street, Bristol, BS1 4HU, UK
Telephone	+44 117 917 7200; +44 117 927 7089
Fax	+44 117 917 7201
E-mail	wendystephenson@theconvergingworld.org
Website	-
Contact person	Ms. Wendy Stephenson

Appendix 2. Affirmation regarding public funding

No public funding involved in the investment.

Appendix 3. Applicability of methodologies and standardized baselines

Refer B.2 of this document.

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

Refer B.6.1 of this document

Appendix 5. Further background information on monitoring plan

Refer B.7.3 of this document.

Appendix 6. Summary report of comments received from local stakeholders

Refer section E of this document

Appendix 7. Summary of post-registration changes

Not applicable

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Document information

Version	*Date*	*Description*
10.1	28 June 2017	Revision to make editorial improvement.
10.0	7 June 2017	Revision to: • Improve consistency with the “CDM project standard for project activities” and with the PoA-DD and CPA-DD forms; • Make editorial improvement.
09.0	24 May 2017	Revision to: • Ensure consistency with the “CDM project standard for project activities” (CDM-EB93-A04-STAN) (version 01.0); • Incorporate the “Project design document form for small-scale CDM project activities” (CDM-SSC-PDD-FORM); • Make editorial improvement.
08.0	22 July 2016	EB 90, Annex 1 Revision to include provisions related to automatically additional project activities.
07.0	15 April 2016	Revision to ensure consistency with the “Standard: Applicability of sectoral scopes” (CDM-EB88-A04-STAN) (version 01.0).
06.0	9 March 2015	Revision to: • Include provisions related to statement on erroneous inclusion of a CPA; • Include provisions related to delayed submission of a monitoring plan; • Provisions related to local stakeholder consultation; • Provisions related to the Host Party; • Make editorial improvement.
05.0	25 June 2014	Revision to: • Include the Attachment: Instructions for filling out the project design document form for CDM project activities (these instructions supersede the "Guidelines for completing the project design document form" (Version 01.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for the application of the methodology (ies) to the project activity in B.7.4 and Appendix 1; • Change the reference number from F-CDM-PDD to CDM-PDD-FORM; • Make editorial improvement.
04.1	11 April 2012	Editorial revision to change version 02 line in history box from Annex 06 to Annex 06b.

Version	*Date*	*Description*
04.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the project design document form for CDM project activities" (EB 66, Annex 8).
03.0	26 July 2006	EB 25, Annex 15
02.0	14 June 2004	EB 14, Annex 06b
01.0	03 August 2002	EB 05, Paragraph 12 Initial adoption.

Decision Class: Regulatory
Document Type: Form
Business Function: Registration
Keywords: project activities, project design document