Project design document form

(Version 11.0)

BASIC INFORMATION	
Title of the project activity	9 MW Wind Energy Farm at Jodhpur Rajasthan by HZL
Scale of the project activity	☐ Large-scale ☒ Small-scale
Version number of the PDD	04
Completion date of the PDD	24/11/2020
Project participants	M/s Hindustan Zinc Limited (India) EKI Energy Services Limited (Australia)
Host Party	India
Applied methodologies and standardized baselines	AMS.I.D. "Grid connected renewable electricity generation" Version 18 Standardized baselines – Not Applicable
Sectoral scopes	Scope 1: Energy Industries (renewable-/non-renewable sources)
Estimated amount of annual average GHG emission reductions	14,740 tCO_2e

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

Hindustan Zinc Ltd. (HZL), a vertically integrated natural resources enterprise, headquartered at Udaipur, Rajasthan having broad operations ranging from exploration, mining, ore processing to smelting of non-ferrous metals, is the owner and project proponent of the proposed project activity. The project activity implemented 9 MW wind power project consisting of 6 WTGs of individual capacity 1.5 MW sourced from Suzlon Energy Limited at Osiyan in Rajasthan, India. The project activity is in line with the sustainable development priority of the country. The electricity generated from the wind farm is exported to the regional electricity grid and sold to the state electricity utility thereby marginally contributing to reducing the energy demand supply gap in the state of Rajasthan, diversification of grid supply and reduce greenhouse gas emissions.

Purpose of the Project Activity

The project activity aims to mitigate Green House Gas (GHG) emissions through generation of renewable power, and export of power to the regional grid. The electricity generated from the project site will displace the electricity generated from thermal power stations feeding into regional grid. Since wind power is GHG emissions free, the power generated will displace the anthropogenic GHG emissions generated by the fossil fuel based thermal power stations.

Contribution of the project activity to sustainable development:

Ministry of Environment and Forest and Climate Change, Govt. of India has stipulated the following indicators for sustainable development in the interim approval guidelines for CDM projects[1]

- **Social well being**

The CDM project activity should lead to alleviation of poverty by generating additional employment, removal of social disparities and contribution to provision of basic amenities to people leading to improvement in quality of life of people.

  - The project activity generates employment in the region during construction as well as operation of the project activity.
  - It leads upliftment of society by generation of employment and development of the region.
  - It augments power generation in the region that would aid the local population.

- **Economic well being**

The CDM project activity should bring in additional investment consistent with the needs of the people.

  - The project activity leads to additional business for equipment suppliers. O&M contractors, civil work contractors etc .
  - It leads to additional investment for the development of infrastructure in the region like roads, communication facilities etc and the same could be utilized by the local population.

[1] https://ncdmaindia.gov.in/approval_process.aspx

- **Environmental well being**

This should include a discussion of impact of the project activity on resource sustainability and resource degradation, if any, due to proposed activity; bio-diversity friendliness; impact on human health; reduction of levels of pollution in general.

- The proposed project activity reduces the GHG emissions associated with the combustion of fossil fuels in grid connected power plants.
- The project activity utilizes wind power as the source of kinetic energy used to generate renewable power. Wind power generation does not consume any fuels or water for power generation.
- Wind is a clean form of energy and electrical power generation using wind does not produce any solid waste products (such as ash from combustion), emissions of carbon dioxide, SOx, or NOx.

- **Technological well being**

The CDM project activity should lead to transfer of environmentally safe and sound technologies with a priority to the renewable sector or energy efficiency projects that are comparable to best practices in order to assist in up-gradation of technological base.

- The proposed project activity demonstrates the use of wind-based electricity generation, which would serve as an example for other industries to replicate.

A.2. Location of project activity

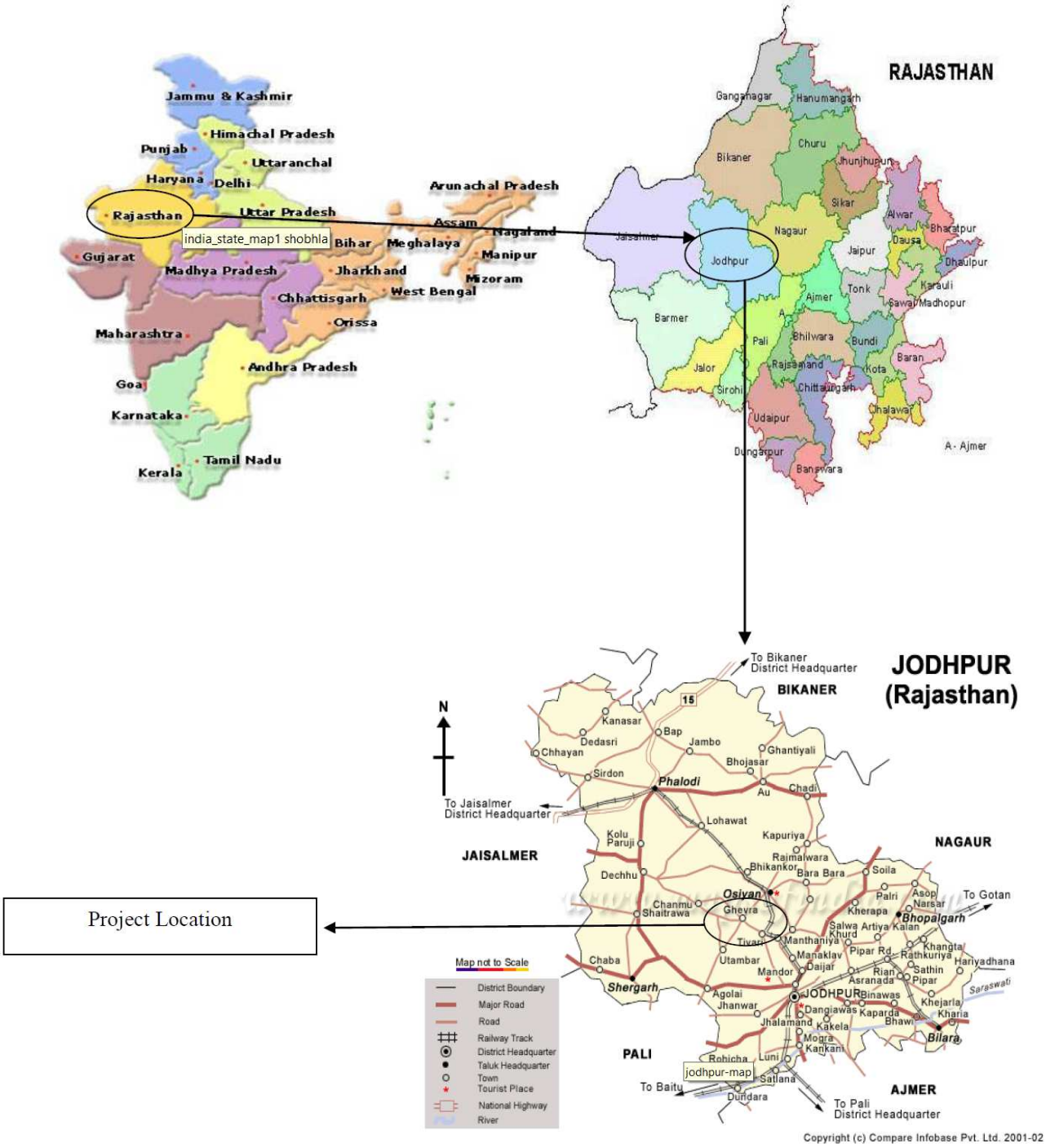
Host Country:
India
Region/State/Province:
Rajasthan
District:
Jodhpur
Village:
Dhaundhara, Bhambhuo ki Dhani, Dhaundariya

Sr. No.	WTG No.	Village
1	OS – 58	Dhaundhara
2	OS – 57	Bhambhuo ki Dhani
3	OS – 56	Bhambhuo ki Dhani
4	OS – 54	Dhaundhariya
5	OS – 51	Dhaundhariya
6	OS - 50	Dhaundhariya

The project activity consists of six 1.5 MW wind turbine in the district of Jodhpur in the state of Rajasthan, India.
The specific geographical coordinates of the individual WEGs are as follows:

Sr. No.	WTG No.	Latitude	Longitude
1	OS – 58	N26^0 44’ 24.9”	E72^0 58’ 45.8”
2	OS – 57	N26^0 44’ 36.1”	E72^0 58’ 39.0”
3	OS – 56	N26^0 44’ 38.0”	E72^0 58’ 22.6”

4	OS – 54	N26^0 44’ 25.2”	E72^0 57’ 58.8”
5	OS – 51	N26^0 44’ 24.8”	E72^0 57’ 20.9”
6	OS - 50	N26^0 43’ 49.5”	E72^0 57’ 13.4”



A.3. Technologies/measures

Since the capacity of the wind farm project is 9 MW, which is less than the maximum qualifying capacity of 15 MW, the project falls under the UNFCCC small-scale CDM project

activity categories under Type-I with project activity being renewable electricity generation for a grid.

Sectoral Scope: I – Energy Industries (renewable-/non-renewable sources)
Type: I -Renewable Energy Projects
Category: I.D "Grid connected renewable electricity generation"

As per paragraph 1 under Category I.D of Appendix B of the UNFCCC-defined **simplified modalities and procedures (M&P) for small-scale CDM project activities** (Version 10: 23rd December 2006) Type I.D "comprises renewables, such as photovoltaics, hydro, tidal/wave, wind, geothermal, and biomass, that supply electricity to an electricity distribution system that is or would have been supplied by at least one fossil fuel or non-renewable biomass fired generating unit". The project is a grid-connected wind based power plant and qualifies as a Category I. D project activity.

The technology consists of conversion of the energy available in the wind flow to mechanical energy using a wind turbine. By connecting the turbine to a generator, the mechanical energy is converted into electricity energy. Therefore, in this process, there are no greenhouse gas emissions or burning of any fossil fuels. Thus electricity is generated through sustainable means without causing any negative effect on the environment and hence the technology is environmentally safe and sound.

The project employs the use of wind energy for the purpose of electricity generation. Since, the technology employed by the project proponent does not result in GHG emissions; the project does not cause any negative effects on the environment. Hence, the technology used for the project activities do not pose any threat to the environment when compared to the fossil fuel-fired power plants.

WTG (S82, 1.5 MW, 50 Hz) TECHNICAL DATA

Rated capacity : 1500 kW
Rotor diameter : 82 m
Hub height : 78.5 m

Rotor with Pitch Control

Type : Upwind rotor with active pitch control
Number of blades : 3
Swept area: 5281 m²
Blade material : The rotor blades are made epoxy bonded fibre glass
Rotor speed : 16.30 rpm
Tip speed : 70 m/s

Generator :
Type: Single fed Induction Generator with slip-rings, variable rotor resistance with SUZLON-FLEXI-SLIP control system
Hub : Cast spherical hub
Bearings : Spherical roller bearing
Tower : Steel Tubular, 76 m height

Technology Transfer
No technology transfer from other countries is involved in the project.

Plant Load Factor

The expected plant load factor for the project activity as determined by an independent third party assessment is 19.85%. The plant load factor is applied in accordance with paragraph 3(b) of the "Guidelines for the reporting and validation of plant load factors" for ex-ante estimation of emission reductions. However, for the investment analysis, the PLF available the time of investment decision (based on offer Letter from Suzlon dated 04/12/2010) is applied as explained in section B.5

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	Hindustan Zinc Limited (Private Entity)	No
Australia	EKI Energy Services Limited	No

A.5. Public funding of project activity

There is no public funding involved in the proposed project activity. The project proponent hereby confirms that there is no divergence of Official Development Assistance (ODA) to the proposed project activity. The required funds have been raised through in-house funding.

A.6. History of project activity

The registration date of the project activity under CDM mechanism is 08/11/2012. Currently, the project is applying for Renewal of 2nd Crediting Period.

The CDM project activity is registered as a CDM project activity and not included as a component project activity (CPA) in a registered CDM programme of activities (PoA).
The CDM project activity is also not a project activity that has been deregistered.
The CDM project activity was not a CPA that has been excluded from a registered CDM PoA.
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

According to Appendix C, paragraph 2 of Simplified Modalities & Procedures for small scale CDM project activities, a proposed small-scale project activity shall be deemed to be a de-bundled component of a large project activity if there is a registered small-scale CDM project activity or an application to register another small-scale CDM project activity:

- By the same project participants;
- In the same project category and technology/measure; and
- Registered within the previous 2 years; and
- Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point.

There are two large scale CDM wind power projects by the project proponent registered with UNFCCC.
Following are the details of the projects:

1. Wind power project by HZL in Gujarat[2]
2. Wind power project by HZL in Karnataka[3]

These projects are registered under CDM. The same can be viewed on the site of UNFCCC for CDM. Also PP have other large scale projects in Rajasthan and Maharashtra (UN7895, UN7981, and UN7873)

None of the above projects are within 1 km of the above mentioned projects, and have been implemented in different states.

It can be seen that there is no registered CDM project activity or an application to register another CDM project activity by Hindustan Zinc Limited in same project category, technology /measure which is within 1 km of the project boundary of the proposed small scale project activity. The proposed project activity qualifies for the use of simplified modalities and procedures for small-scale CDM project activities as it is not a debundled component of a large scale project activity.

SECTION B. Application of methodologies and standardized baselines

B.1. References to methodologies and standardized baselines

As per the Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories, Type I.D Version 18 has been used.

Title: "Grid connected renewable electricity generation".
Reference: AMS I D, Version 18[4]

It has been referred from the list of approved methodologies for CDM project activities in the UNFCCC/CDM (https://cdm.unfccc.int/methodologies/SSCmethodologies/approved) website

The approved methodology uses the
"Tool to calculate the emission factor for an electricity system" [5] Version 7.0 for determination of the baseline scenario,
"Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"[6] Version 03.0 for determining project emissions and also draws upon Appendix B of the simplified modalities and procedures for small-scale CDM project activities "Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories" for demonstration of additionality.
"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

B.2. Applicability of methodologies and standardized baselines

The methodology AMS.I.D Version 18 is being applied for the project activity. The reasons for the choice of project type and category for the project activity are as follows:

[2] http://cdm.unfccc.int/Projects/DB/BVQI1211956663.14/view

[3] http://cdm.unfccc.int/Projects/DB/BVQI1208874936.63/view

[4] https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK

[5] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf
[6] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v3.pdf

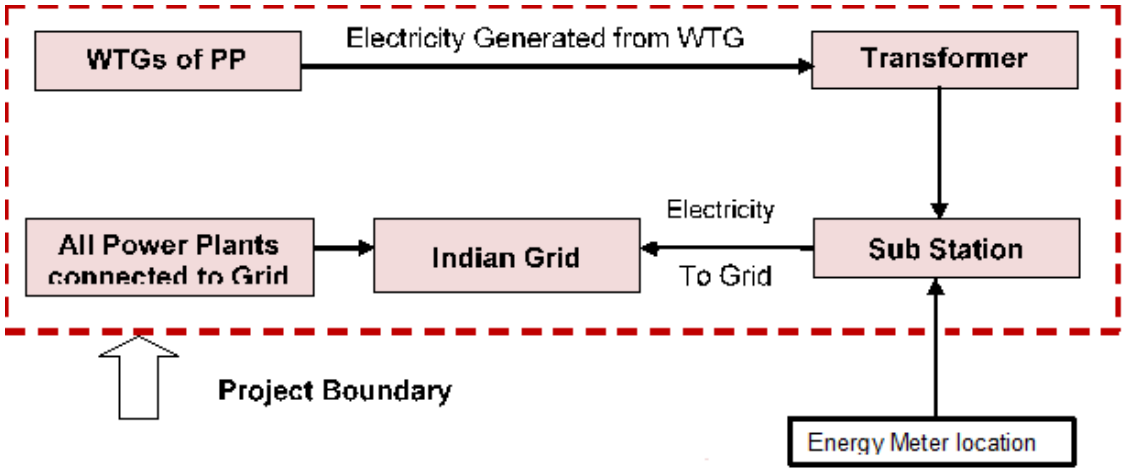
Criteria	Applicability to the project
1. This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass: (a) supplying electricity to a national or a regional grid; or (b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.	The project is renewable energy generation through WTGs. The project will supply electricity to the Indian grid. Thus, this criterion is applicable to the project activity and the project activity complies with this criterion.
2. Illustration of respective situations under which each of the methodology (i.e. AMS-I.D, AMS-I.F and AMS-I.A2) applies is included in Appendix	As per Appendix of the AMS.I.D Version 18 project activities that supply electricity to the national/regional grid are applicable under AMS.I.D Version 18. Since the proposed project activity under consideration will also supply electricity to the regional grid. Thus, this criterion is applicable to the project activity and the project activity complies with this criterion.
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 activity is Greenfield installation of new power plant at a site where there was no renewable energy power plant operating prior to implementation of project. Thus, this criterion is applicable to the project activity and the project activity complies with this criterion.
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	The project activity is not a hydro power plant. Thus, this criterion is not applicable to the project activity.

section, is greater than 4 W/m^2.	
5. If new unit has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15MW for a small-scale CDM project activity applies only to the renewable component. If new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15MW.	The project does not involve any use of fossil fuel. Thus, this criterion is not applicable to the project activity.
6. Combined heat and power (co-generation) systems are not eligible under this category.	The project activity generates only power and hence is not a cogeneration system. Thus, this criterion is not applicable to the project activity.
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.	The project activity is Greenfield and there is no existing power generation facility at the site. Thus, this criterion is not applicable to the project activity.
8. In the case of retrofit or replacement, to qualify as a small scale project, the total output of the modified or retrofitted or replacement unit shall not exceed the limit of 15 MW.	Project activity is neither retrofit nor modification of existing facility. Thus, this criterion is not applicable to the project activity.
9. In the case of landfill gas, waste gas, waste water 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 Type-I methodologies such as "AMS I.C.: Thermal energy production with or without electricity" shall be explored.	The project activity is a renewable wind energy power project and is not a landfill gas, waste gas, wastewater treatment and agro-industries projects or recovered methane emissions project. Hence, the criteria is not applicable to the project activity
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 activity is a renewable wind energy power project and is not a biomass project. Hence the criteria is not applicable to the project activity.

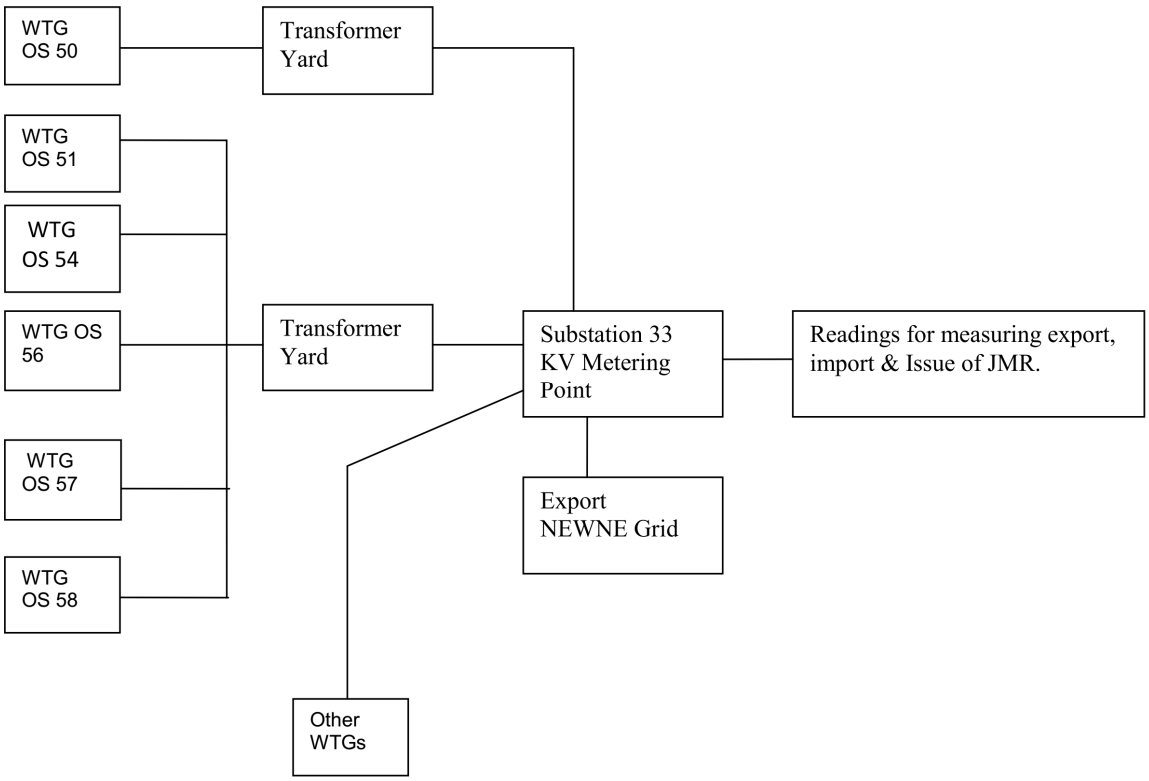
Since the project activity is a small scale project activity of 9 MW Wind, the project activity falls under the Sectoral Scope: 01 - Energy industries (renewable/non-renewable sources), Project Type: I - Renewable Energy Projects and Project Category: Grid-connected electricity generation from renewable sources AMS-I.D (Version 18.0).

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

The project boundary as described in AMS.I.D includes the project power plant and all power plants connected physically to the electricity system. Accordingly the project boundary includes wind power generation system and all power plants connected physically to the local grid to which the renewable electricity is supplied to avoid GHG emissions. The project is located in the state of Rajasthan and hence falls under the Indian grid. The following diagram explains the project boundary for the proposed project activity.



The metering, feeder arrangement is under control of state electricity board and PP do not have any control on it. The meter locations, feeder arrangements may change during crediting period. The electricity is exported to NEWNE regional grid which is part of Indian Grid. The details of current metering locations for the project activity are as below.



Source		GHG	Included?	Justification/Explanation
Baseline	Grid connected electricity generation.	CO_2	Yes	Main emission source
		CH_4	No	Minor emission source
		N_2O	No	Minor emission source
		Other	No	Project activity does not emit other forms of GHG emissions
Project activity	Greenfield Wind Power Project Activity.	CO_2	No	No CO_2 emissions are emitted from the project
		CH_4	No	Project activity does not emit CH_4
		N_2O	No	Project activity does not emit N_2O
		Other	No	Project activity does not emit other forms of GHG emissions

B.4. Establishment and description of baseline scenario

Updated baseline for the second crediting period in line with 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.

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 paragraph 283 to 286 of Project Standard version 02.0.

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 baseline scenario remains unchanged and is in compliance with all the relevant mandatory national and/or sectoral policies.

Step 1.2: Assess the impact of circumstances

The 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. Thus this project activity was a voluntary investment which intends to replace equivalent amount of electricity at grid from renewable source. PP was not bound to incur this investment; hence absence of project activity (i.e. the investment) does not lead to any continued baseline practice for PP within their scope whereas the continued operation of the project activity would continue to replace equivalent amount of electricity at 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 356,100.20 MW as on 31.03.2019, consisting of 226,279.34 MW Thermal, 77,641.63 MW Renew, 45,399.22 MW Hydro and 6,780 MW Nuclear. Sector-wise details of installed capacity are

shown in Table 1. However, it is evident from Table 1[7] that 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 CO_2 emissions in the country by increased use of renewable energy sources.

Furthermore, project participant has considered the latest available CO_2 Baseline Database (CEA database, version 15) 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 31/03/2019 (CEA Database version 15)

Sector	Thermal				Nuclear	Hydro	RES	Total
	Coal	Gas	Diesel	Total				
State	65366.50	7118.71	363.93	72849.14	0.00	29878.80	2347.93	105075.86
Central	58820.00	7237.91	0.00	66057.91	6780.00	12126.42	1632.30	86596.63
Private	76518.00	10580.60	273.70	87372.30	0.00	3394.00	73661.40	164427.70
All India	200704.50	24937.22	637.63	226279.34	6780.00	45399.22	77641.63	356100.19

Note - In the above table, the last column "Total" includes the total summation of installed capacity of thermal, Nuclear, Hydro and Renewable Energy.

Thus, current baseline remain same and there is no impact if 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.

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

[7] http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver15.pdf

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 available at the time of PDD submission for renewal.

In line with the project standard version 02.0, the impact of new relevant national and/or sectoral policies and circumstances on the baseline taking into account relevant EB guidance with regard to renewal of the crediting period at the time of requesting renewal of crediting period; and the correctness of the application of an approved baseline methodology for the determination of the continued validity of the baseline or its update, and the estimation of emission reductions for the applicable crediting period

Impact of the national and/or sectoral policies and circumstances upon the baseline scenario of the project activity

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. The Electricity Act 2003 was in force at the time of the completion of the baseline study for the registered PDD.

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[8] on 12th February 2005 which was in force at the time of completion of the baseline study as stated in the registered PDD 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, State Electricity Regulatory Commissions (SERCs) have announced preferential tariffs and 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 study for the registered PDD 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 Southern Grid has not increased to such an extent that this would lead to more than 50% contribution from the low cost must run resources towards the total generation from the Southern Grid.

[8] http://www.cercind.gov.in/Act-with-amendment.pdf

The approved small scale methodology for Grid connected renewable electricity generation, AMS-I.D (Version 18), has been used to determine the baseline and the estimation of emission reductions for the applicable crediting period. As referred in the methodology "*Tool to calculate the emission factor for an electricity system*" *(version 07.0)* has been used to determine continued validity of the baseline based on combined margin (CM) calculations.

As per CEA database version 15, the fossil fuel dominated electricity is more than renewable sector and is continuing with same pattern. In light of the above discussion it is to be concluded that in accordance with relevant guidelines stipulated in the Project Standard version 02.0, national and/or sectoral policies and circumstances had been considered towards formulating the OM & BM baseline scenario. Hence the baseline scenario as applied for the present project activity remains justified.

As per the approved small scale methodology for Grid connected renewable electricity generation, AMS-I.D (Version 18.0) para 19: If the project activity is the installation of a Greenfield power plant, "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 grid".

The project activity involves setting up of wind project to produce electricity and supply to the grid. In the absence of the project activity, the equivalent amount of power would have been supplied by the Indian grid, which is fed mainly by fossil fuel fired plants.

In the absence of the project activity, the equivalent amount of power would have been drawn from the Indian grid. Hence, the baseline for the project activity is the equivalent amount of power from the Indian grid.

The combined margin ($EF_{grid,y}$ or $EF_{grid,CM,y}$) is the result of a weighted average of two emission factor pertaining to the electricity system: the operating margin (OM) and build margin (BM). Calculations for this combined margin must be based on data from an official source (where available) and made publically available. The CEA database version 15 is the latest available data at the time of PD submission to DOE for validation, hence same is considered for emission factor calculations.

The combined margin of the Indian grid used for the project activity is as follows:

Parameter	Value	Nomenclature	Source
$EF_{grid,y}$ or $EF_{grid,CM,y}$	0.9419 tCO_2/MWh	Combined margin CO_2 emission factor for the project electricity system in year y	Calculated as the weighted average of the operating margin (0.75) & build margin (0.25) values, sourced from Baseline CO_2 Emission Database, Version 15.0, Dec 2019 published by Central Electricity Authority (CEA), Government of India
$EF_{grid,OM,y}$	0.9622 tCO_2/MWh	Operating margin CO_2 emission factor for the project electricity system in year y	Calculated as the last 3 year (2016-17, 2017-18, 2018-19) generation-weighted average, sourced from Baseline CO_2 Emission Database, Version 15.0, Dec 2019 published by Central Electricity Authority (CEA), Government of India

$EF_{grid,BM,y}$	0.8811 tCO_2/MWh	Build margin CO_2 emission factor for the project electricity system in year y	Baseline CO_2 Emission Database, Version 15.0, Dec 2019 published by Central Electricity Authority (CEA), Government of India

B.5. Demonstration of additionality

As per the "*Guidance on the demonstration and assessment of prior consideration of the CDM"* Version 03, for project activities with start date after 02 August 2008, the project participant is required to inform the host party DNA and UNFCCC Secretariat in writing of the commencement of the project activity and of their intention to seek CDM status. Such a notification is required to be made within six months of the project activity start date and must contain the precise geographical location and a brief description of the proposed project activity. In accordance with this guidance, Hindustan Zinc Limited had informed the host party DNA as well as the UNFCCC Secretariat on 16/05/2011 of its intention to seek CDM status so as to make the project activity financially viable. This notification falls within six months of the project activity start date which is described in detail in section C.1.1.

As per the UNFCCC specified simplified modalities to demonstrate additionality, 'The project participants shall provide an explanation to show that the project activity would not have occurred due to at least one of the four listed barriers in Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities (SSC-PDD)'. The project activity faces the following barriers:

Investment Barrier

The project proponent has adopted to establish the additionality of the project activity by performing an investment analysis using Equity IRR; which is one of the known financial indicators used by banks, financial institutions and project developers for making investment decisions. The project activity generates revenue from sale of power to the state utility, and therefore a simple cost analysis is not applicable.

Furthermore, in accordance with the Guidelines on the Assessment of Investment Analysis', EB 62, Annex 5, para and Guidance 19, which states that "*If the proposed baseline scenario leaves the project participant no other choice than to make an investment to supply the same (or substitute) products or services, a benchmark analysis is not appropriate and an investment comparison analysis shall be used. If the alternative to the project activity is the supply of electricity from a grid this is not to be considered an investment and a benchmark approach is considered appropriate.*" Since, the project activity supplies electricity to grid, investment comparison analysis is not appropriate in the context of the project activity, and a benchmark analysis has been carried out.

The project is entirely funded by project proponent's equity and involves no debt funding. The chosen indicator, Equity IRR, represents the overall returns from an investment, and therefore, is duly considered as the financial indicator for the project activity. Post Tax equity IRR for a project activity needs to be be worthy enough from the point of view of investors. Therefore Post tax equity IRR has been compared with the benchmark rate of return on equity (cost of equity).

The assumptions used for the carrying out the IRR analysis are as below:

Assumption	Value	Unit	Reference
Capacity			
Project Size	9	MW	Techno-commercial offer from equipment supplier / O&M service provider
Total Project Cost	538.95	INR million	Techno-commercial offer from equipment supplier / O&M service provider
Means of Finance			
Debt (0%)	0	INR million	Investment decision
Equity (100%)	538.95	INR million	Investment decision
Operating Parameters			
Plant Load Factor*	22.83	%	Estimated Electricity Generation specified in Offer Letter from Suzlon dated 04/12/2010
Life of the WTG assumed	20	Years	WTG technical specifications
Operation & Maintenance Cost			
O & M Cost Exemption	2.00	years	Techno-commercial offer from equipment supplier / O&M service provider
O & M Cost	1.425	Million/WTG	Techno-commercial offer from equipment supplier / O&M service provider
O & M escalation	5.0	%	Techno-commercial offer from equipment supplier / O&M service provider
Tax on OMS	10.30	%	Techno-commercial offer from equipment supplier / O&M service provider
Insurance cost			
Insurance Cost	0.1	Million/WTG	Insurance costs incurred in previously commissioned wind power projects
Depreciation Rate			
Yearly book depreciation	5.28	%	As per Companies Act[9]
Yearly tax depreciation	7.69	%	As per IT Act[10]
Tax			
Income Tax	33.22	%	As per IT Act http://www.incometaxindiapr.gov.in/ incometaxindiacr/contents/forms2010/ pamphets/COMPANIES_2012_13.htm

[9] http://asa-india.com/Depreciation%20Rates%20Companies%20Act.pdf

[10] http://law.incometaxindia.gov.in/DIT/File_opener.aspx?page=ITRU&schT=rul&csId=2f13c0bd-dec4-4df6-a273-431e3b91a01b&rNo=&sch=&title=Taxmann%20-%20Direct%20Tax%20Laws

Minimum alternate Tax	19.93	%	http://www.incometaxindiapr.gov.in/incometaxindiacr/contents/forms2010/pamphets/COMPANIES_2012_13.htm
Tariff			
Tariff**	3.87 (This includes benefit of 1% due to transmission losses as per the tariff order)	Rs	RERC Tariff Order dated 06/08/2010
GBI	0.5	INR / kWh	http://mnre.gov.in/file-manager/UserFiles/faq_wind.pdf

* The PLF considered for the investment analysis is based on the estimated generation indicated by the equipment supplier in the offer letter dated 04/12/2010, which corresponds to a PLF of 22.83%. This PLF is applicable at the time of investment decision and is in compliance with EB 62 Annex 5, Paragraph 6. However, in line with the requirements of EB 48, Annex 11, PLF has also been evaluated based on an independent third party assessment by Power and Energy Consultants (after the investment decision for the project activity). However, as the PLF based on the offer letter (22.83%) is more conservative than the PLF based on the third party assessment (19.85%), the offer letter has been taken as the basis of the PLF applied for computation of the post tax equity IRR.

**The tariff of 3.87 was available at the time of decision making and hence being considered for the calculation of IRR. However, the Project Proponent has gone for PPA lately and it was singed at INR 4.22. This falls within 10% of the sensitivity analysis and has been explained in the sensitivity analysis observations.

Using the assumptions in the table above, the post-tax equity IRR for the project activity works out to be **8.45%,** calculated in accordance with the "Guidance on the Assessment of Investment Analysis" Version 05. The project activity is not financially attractive as the equity IRR is much below the selected benchmark.

The Post tax Internal Return Rate of return has been computed to be **8.45%**

Benchmark Analysis

As per paragraph 14 in the Guidelines on the Assessment of Investment Analysis, EB 62 Annex 5:

"In the cases of projects which could be developed by an entity other than the project participant the benchmark should be based on parameters that are standard in the market."

In accordance with the guideline, the benchmark has been determined using parameters standard in the market, and is based on the expected return on equity calculated using the Capital Asset Pricing Model (CAPM). The Capital Asset Pricing Model (CAPM) is a well accepted methodology for estimating the expected rate of return on equity. The reliability of CAPM as a tool for evaluating the minimum rate or return for an investor, is well documented. It may be noted that all the relevant indexes (BSE Sensex, BSE 100, BSE 200 and BSE 500) were analyzed for calculating the market returns and the most conservative value of the market return has been used while calculating the Benchmark for the project activity. BSE 500 is not considered as Indices since the data available is only from Year 1999 and thus the data is available for only 10 years which is not comparable for the project life time which is 20 years. The comparison of the same is provided in the consolidated excel sheet. January 1991 is chosen for BSE Sensex, BSE 100 & BSE 200 thus providing the market returns for 19.92 years which is comparable with the operational lifetime of the

project activity (20 years). Further, the use of data from 1991 is appropriate as the economic liberalization of the Indian economy started in 1991

(http://www.indiainbusiness.nic.in/economy/economic_reforms.htm). Hence, the economic growth path of India changed from 1991 and the use of data from this year provides a realistic representation of the market returns used to estimate benchmark.
As per CAPM, the required return on investment is computed as follows:

$$K_e = R_f + \beta \times (R_m - R_f)$$

where:
K_e = Rate of return on equity capital;
R_f = Risk-free rate of return;
β (Beta) = The stock's risk relative to that of the whole market;
$R_m - R_f$ = Market risk premium;

Risk free rate:
The risk free rate is understood as the rate of return on an asset that is theoretically free of any risks. Therefore the weighted average yield of Government of India Securities are considered as risk free rate determined at the time of project start. This data is published by Reserve Bank of India. The latest risk free rate available at the time of decision making was for the year 2009-10 (20 years maturity period has been taken to be conservative) published on 12h November 2010 by RBI

(Reference: http://www.rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=11731)

The applicable risk free rate is 8.30%.

Risk Premium:
The market risk premium, as measured and applied in practice, is the premium above the risk-free rate of return that investors expect to earn on a well-diversified portfolio of equities. The most common approach for estimating the risk premium is to base it on historical data. In the CAPM, the premium is estimated by looking at the difference between average return on stocks and return on government securities over a period of time.

Market rate of return, **Rm = 15.87%**
The risk premium has been calculated as the difference in compounded annual return between the broad well diversified market portfolio represented by BSE Sensex index and the Government bond rates since the year of inception of BSE Sensex. The detailed calculations are presented in the attached excel sheet.
Source: BSE Stock Exchange (www.bseindia.com)

The applicable risk premium is determined as: 15.87% – 8.30% = 7.57%.

Beta:

Beta (β) indicates the sensitivity of the company to market risk factors. For companies that are not publicly listed, the beta is determined by referring beta values of publicly listed companies that are engaged in similar types of business. The project activity type is wind power generation; the approach therefore should be to base the beta for the project on the beta values of listed wind power generation companies in India. However, in the absence of adequate data on companies which are exclusively into the exactly same type of business (i.e. wind power projects), the next best option for assessing the risk of these projects is to consider the data available on companies which are involved in similar businesses.

Therefore, we have considered beta values of electricity generating companies in India. The group of companies considered includes renewable as well as conventional power generating companies. Investors demand a higher return from renewable energy projects than from conventional energy ones, given the higher risks in renewable, including risks of technology, risks from significantly varying and unpredictable resource availability (e.g. water in a run of the river project), and a lower established support base for such projects relative to that for conventional power (e.g. grid connections, bank finance, suppliers, etc.). The use of this Beta value is therefore considered conservative, as it does not add for the higher risk of non conventional energy.

The Beta value taken for this analysis is based on the beta values of the listed power producing companies engaged in similar business as the project activity at the time of investment decision estimated by regressing weekly returns on stock against local index, using 5 years[11] of data if available otherwise the data since incorporation of the company has been used. The equity beta values have been taken from BSE. The beta value for PTC has not been considered in the analysis as the stock as it is a power trading company. The beta values for the five years period prior to the time of investment decision has been taken. The table below summarizes the beta values:

Name	**Effective Tax**	**Debt/ Equity**	**Levered Equity beta**	**Unlevered Equity Beta**
CESC Ltd.	17%	0.621	1.0713	0.7088
Gujarat Industries Power Co Ltd	17%	0.725	1.2145	0.7860
TATA Power	25%	0.525	0.9953	0.7119
Reliance Infrastructure Limited	11%	0.425	1.7585	1.3015
Neyveli Lignite Corporation	22%	0.379	1.4702	1.1625
BF Utilities	29%	1.101	2.0982	1.5101
NTPC	20%	0.563	0.6200	0.4467
Jaiprakash Power Venture Limited	17%	1.586	1.7082	0.7416
Average				**0.9211**

The average asset beta of companies engaged in power sector is thus **0.9211**

The required rate on equity based on BSE 200 is the most conservative among the three indices as tabulated below:

Market Index	**Average Beta**	**CAPM**
BSE 100	**0.9304**	**15.81%**
BSE 200	**0.9201**	**15.27%**
BSE Sensex	**0.9703**	**15.96%**

The detailed benchmark calculation spreadsheets for all three market indices have been submitted to the DOE. Therefore, the benchmark for the project activity is applied as **15.27%** on a conservative basis.

The required return on equity computing using CAPM is 15.27%. The Post tax equity IRR calculated for the project activity without CDM revenue was **8.45%** which is well below the benchmark of **15.27 %.**

[11] Five years of Beta value has been chosen in line the Crisil Report on Cost of Capital for Central Sector Utilities which states that 'for such economies, and for companies whose capital structure and operating environment has been changing, the time period over which beta is calculated should be small',

Sensitivity Analysis

A sensitivity analysis has been carried out, by varying the critical parameters of the project activity. As per paragraph 20 of the "Guidance on Assessment of Investment Analysis", EB 62 Annex 5: "only variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation."

Sensitivity analysis has been carried out considering variations in PLF, tariff rate, O&M cost, and project cost. In accordance with Paragraph 21 of the guidance, a range of +10% to -10% has been considered as the range of variation.

Upon introducing the variation of 10% in crucial parameters the IRR does not surpass the benchmark. The results of sensitivity analysis for the project activity are as given below:

S. No.	Parameters	Variation	IRR without CDM
1.	PLF	+ 10 %	10.07%
		- 10 %	6.79%
2.	Tariff rate	+10 %	10.04%
		-10 %	6.81%
3.	O&M Cost	+10%	8.20%
		-10 %	8.69%
4.	Project Cost	+10%	6.93%
		-10 %	10.27 %

It is evident from the above that the Equity IRR without CDM benefits is consistently below the benchmark of 15.28 %, even after introducing variation of 10% in the critical parameters. The variation of parameters required for the Equity IRR to attain the benchmark is tabulated below.

S. No.	Parameters	Variation for IRR without CDM revenue to attain benchmark
1.	PLF	+44%
2.	Tariff rate	+45%
3.	O&M Cost	-350%
4.	Project Cost	-30%

It is unlikely that the above variations would be achieved as:

- The PLF considered in the financial analysis (based on offer letter dated 04.12.2010) is 22.83% whereas actual PLF as per third party report is 19.67%. An increase of 44% is highly unlikely after being conservative (PLF considered is 22.83% for IRR Calculation).
- The project proponent has entered into a power purchase agreement valid for 20 years. The tariff of INR 3.87 was available at the time of decision making and hence being considered for the calculation of IRR. However, the Project Proponent has gone for PPA lately and it was singed at INR 4.22. This falls within 10% of the sensitivity analysis and would not be varying further as the PPA has already been signed.
- The IRR remains below the benchmark at no O&M costs. It is not possible to have negative costs.

- The purchase orders for the project have been signed based on the offer letter considered at the time of investment decision. Therefore any decrease in the investment cost is not possible.

The project activity was not financially viable to the project proponent considering the low financial returns as described above. The investment decision was approved after considering the CDM revenues, which would be accrued upon registration of the project activity with UNFCCC.

B.6. Estimation of emission reductions

B.6.1. Explanation of methodological choices

As per the approved consolidated Methodology AMS - I.D, version 18:

Baseline emissions include only CO_2 emissions from electricity generation in fossil fuel fired 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:

$$\mathbf{BE_y = EG_{PJ,y} \times EF_{grid,y}}$$

Where:

BE_y = Baseline emissions in year y (t CO_2/yr)

$EG_{PJ,y}$ = 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/yr)

$EF_{grid,y}$ = Combined margin CO_2 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 CO_2/MWh). The emission factor is also abbreviated as $EF_{grid,CM,y}$ as per tool.

As per para 23 of methodology AMS I.D Version 18, 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"; 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.

PP has followed option a) for calculation of grid emission factor.

As per para 26 of AMS I.D methodology Version 18, If the project activity is the installation of a greenfield power plant, then:
$EG_{PJ,y} = EG_{PJ,Facility,y}$
Where:
$EG_{PJ,Facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)

As per methodology, combined grid emission factor as per the "Tool to calculate the emission factor for an electricity system" version 07 is calculated as below.

CO_2 Baseline Database for the Indian Power Sector, Version 15, December 2019 [12] published by Central Electricity Authority (CEA), Government of India has been used for the calculation of emission reduction.

As per Methodological tool: Tool to calculate the emission factor for an electricity system (Version 07.0, EB 100, Annex 4), following six steps have been followed:

(a) **Step 1:** Identify the relevant electricity systems;

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

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

(d) **Step 4:** Calculate the operating margin emission factor according to the selected method;

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

(f) **Step 6:** Calculate the combined margin (CM) emission factor.

Step 1: Identify the relevant electricity systems

As described in tool "For determining the electricity emission factors, identify the relevant project electricity system. Similarly, identify any connected electricity systems". It also states that "If the DNA of the host country has published a delineation of the project electricity system and connected electricity systems, these delineations should be used". Keeping this into consideration, the Central Electricity Authority (CEA), Government of India has divided the Indian Power Sector into five regional grids viz. Northern, Eastern, Western, North-eastern and Southern.

However since August 2006, however, all regional grids except the Southern Grid had been integrated and were operating in synchronous mode, i.e. at same frequency. Consequently, the Northern, Eastern, Western and North-Eastern grids were treated as a single grid named as NEWNE grid from FY 2007-08 onwards for the purpose of this CO_2 Baseline Database. As of 31 December 2013, the Southern grid has also been synchronised with the NEWNE grid, hence forming one unified Indian Grid. Since the project supplies electricity to the Indian grid, emissions generated due to the electricity generated by the Indian grid as per CM calculations will serve as the baseline for this project.

Table: Geographical Scope of Indian Electricity Grid

Northern	Eastern	Western	North-Eastern	Southern
Chandigarh	Bihar	Chhattisgarh	Arunachal Pradesh	Andhra Pradesh
Delhi	Jharkhand	Gujarat	Assam	Karnataka
Haryana	Orissa	Daman & Diu	Manipur	Kerala
Himachal	West Bengal	Dadar&	Meghalaya	Tamil Nadu

[12] http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver15.pdf

Pradesh		Nagar Haveli		
Jammu & Kashmir	Sikkim	Madhya Pradesh	Mizoram	Telangana
Punjab	Andaman & Nicobar	Maharashtra	Nagaland	Puducherry
Rajasthan		Goa	Tripura	Lakshadweep
Uttar Pradesh				Telengana
Uttarakhand				

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.
The Project Participant has chosen only grid power plants in the calculation.

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 Step 4:

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

The data required to calculate Simple adjusted OM and Dispatch data analysis OM is not possible due to lack of availability of data to project developers. The choice of other two options for calculating operating margin emission factor depends on generation of electricity from low-cost/ must-run sources. In the context of the methodology low cost/must run resources typically include hydro, geothermal, wind, low cost biomass, nuclear and solar generation.

Share of Must-Run (Hydro/Nuclear) (% of Net Generation)

	2014-15	2015-16	2016-17	2017-18	2018-19
India	16.8%	15.1%	14.6%	14.3%	14.5%

Data Source: Central Electricity Authority (CEA) database Version 15, Dec 2019[13]

The above data clearly shows that the percentage of total grid generation by low-cost/ must-run plants (on the basis of average of five most recent years) for the Indian grid is less than 50 % of the total generation. Thus the Average OM method cannot be applied, as low cost/must run resources constitute less than 50% of total grid generation.

[13] http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver15.pdf

The simple OM emission factor 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.

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:

(a) **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. For grid power plants, use a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation.

OR

(b) **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 calculation of Simple OM emission factor using a 3-year generation-weighted average, based on the most recent data available at the time of submission of the PD 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 ($EF_{grid,OMSimple,y}$) according to the selected method

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

Net Generation in Operating Margin (GWh) (incl. Imports)			
	2016-17	**2017-18**	**2018-19**
INDIAN Grid	916,278	960,639	995,957

Simple Operating Margin (tCO_2/MWh) (incl. Imports)			
	2016-17	**2017-18**	**2018-19**
INDIAN Grid	0.9636	0.9543	0.9685

Weighted Generation Operating Margin	
INDIAN Grid	**0.9622**

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

As per Methodological tool: "Tool to calculate the emission factor for an electricity system" (Version 07.0, EB 100, Annex 4) para 72:

In terms of vintage of data, project participants can choose between one of the following two options:

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

(b) **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 as described above is chosen by PP 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 PD and is fixed for the entire crediting period.

Build Margin (tCO_2/MWh) (not adjusted for imports)	
	2018-19
INDIAN Grid	**0.8811**

Step 6: Calculate the combined margin (CM) emission factor ($EF_{grid,CM,y}$)

As per Methodological tool: "Tool to calculate the emission factor for an electricity system" (Version 07.0, EB 100, Annex 4) para 81:

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

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

PP has chosen option (a) i.e weighted average CM to calculate the combined margin emission factor for the project activity.

The combined margin emissions factor is calculated as follows:

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

Where:

$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year y (t CO_2/MWh)
$EF_{grid,OM,y}$ = Operating margin CO_2 emission factor in year y (t CO_2/MWh)
W_{OM} = Weighting of operating margin emissions factor (per cent)
W_{BM} = Weighting of build margin emissions factor (per cent)

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

For wind project activities: W_{OM} = 0.75 and W_{BM} = 0.25 (owing to their intermittent and non-dispatchable nature) for the first crediting period and for subsequent crediting periods. Since project activity meets above criteria, the above weightage has been considered for OM and BM.

Therefore, $EF_{grid,CM,y}$ = 0.9622 * 0.75 + 0.8811 * 0.25
= 0.9419 tCO_2/MWh

Baseline emission factor (EF_y):

The baseline emission factor is calculated using the combined margin approach as described in Step 6 above:

Therefore, $EF_{grid,y} = EF_{grid,CM,y}$ = 0.9419 tCO_2/MWh.

BE_y= 15,650 x 0.9419 = 14,740 tCO_2 during a given year y.

B.6.2. Data and parameters fixed ex ante

Data/Parameter	**$EF_{grid,OM,y}$**
Data unit	tCO_2/MWh
Description	Operating Margin CO_2 emission factor in year y
Source of data	Calculated from CEA database, Version 15, Dec 2019[14]
Value(s) applied	0.9622
Choice of data or measurement methods and procedures	Calculated as the last 3 year (2016-17, 2017-18, 2018-19) generation-weighted average, sourced from Baseline CO_2 Emission Database, Version 15.0, Dec 2019 published by Central Electricity Authority (CEA), Government of India.
Purpose of data	For the calculation of the Baseline Emission
Additional comment	This parameter is fixed ex-ante for the entire crediting period

Data/Parameter	**$EF_{grid,BM,y}$**
Data unit	tCO_2/MWh
Description	Build Margin CO_2 emission factor in year y
Source of data	Calculated from CEA database, Version 15, Dec 2019[15]
Value(s) applied	0.8811
Choice of data or measurement methods and procedures	Calculated as per "Tool to calculate the emission factor for an electricity system, version 07" as per the latest data available for the most recent year 2018-19. The data is obtained from "CO_2 Baseline Database for Indian Power Sector" version 15, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of data	For the calculation of the Baseline Emission
Additional comment	This parameter is fixed ex-ante for the entire crediting period

[14] http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver15.pdf
[15] http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver15.pdf

Data/Parameter	$EF_{grid,CM,y}$
Data unit	tCO_2/MWh
Description	Combined Margin CO_2 emission factor in year y
Source of data	Calculated from CEA database, Version 15, Dec 2019[16]
Value(s) applied	0.9419
Choice of data or measurement methods and procedures	The combined margin emissions factor is calculated as follows: $EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,BM,y} * W_{BM}$ 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 (%) = 75% W_{BM}= Weighting of build margin emissions factor (%) = 25%
Purpose of data	For the calculation of the Baseline Emission
Additional comment	This parameter is fixed ex-ante for the entire crediting period

B.6.3. Ex ante calculation of emission reductions

Baseline emissions (BE_y)
The ex-ante calculation of baseline emission are tabulated below:

	Parameter	Value	Units	Source
A	Capacity	9	MW	Purchase Orders
B	Baseline Emission factor ($EF_{grid,y}$)	0.9419	tCO2/MWh	CEA Database Ver 15.0
C	PLF[17]*	19.85	%	Third party PLF report
D	Net Energy Generation ($EG_{PJ,y}$ or $EG_{PJ,Facility,y}$)	15,650	MWh/ year	Calculated as: A x C% x24 x365
E	Baseline Emissions (BE_y) = $EF_{CO2,grid,y}$ x $EG_{PJ,y}$	14,740	tCO_2/ year	Calculated as: D x B

Project activity emissions (PE_y)
As per para 39 of methodology, For most renewable energy project activities, PEy = 0. As there would be no emissions due to the implementation of the project, the project emissions are estimated to be zero.

Leakage (LE_y)
As per AMS I.D, 'if the energy generating equipment is transferred from another activity or if the existing equipment is transferred to another activity, leakage is to be considered', in the project activity, there is no transfer of energy generating equipment and therefore the leakage from the project activity is considered as zero.

[16] http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver15.pdf

[17] *The PLF chosen for emission reductions is taken from third party PLF study by "Power and Energy Consultants" in line with EB 48, Annex 11. This is conservative for emission reduction calculations as the PLF available in the offer letter (22.83%) at the time of investment decision was higher. PP has chosen this higher PLF of 22.83% for the IRR analysis and a lower PLF of 19.85% (from third part report) for emission reduction calculations to be conservative.

Emission reductions (ER_y) are calculated as follows:

Baseline Emissions (BE_y)	14,740	tCO_2/y
Project Activity Emissions (PE_y)	0	tCO2/y
Leakage (LE_y)	0	tCO_2/y
Emission Reductions (ER_y) = BE_y - PE_y - LE_y	**14,740**	**tCO_2/y**

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*	14,740	0	0	14,740
Year 2	14,740	0	0	14,740
Year 3	14,740	0	0	14,740
Year 4	14,740	0	0	14,740
Year 5	14,740	0	0	14,740
Year 6	14,740	0	0	14,740
Year 7	14,740	0	0	14,740
Total	103,180	0	0	103,180
Total number of crediting years	7			
Annual average over the crediting period	14,740	0	0	14,740

*Year 1 represents first year of second crediting period (1 December 2020 to 30 November 2021) and similar approach follows for subsequent years.

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

Data/Parameter	$EG_{PJ,y}$ or $EG_{PJ,Facility,y}$
Data unit	MWh
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y
Source of data	Joint Meter Readings / Statements on Break-up of Net Export Units prepared by the O&M Service provider
Value(s) applied	15,650

Measurement methods and procedures	Net electricity supplied to grid would be calculated using monitored values through the following method: Energy meters (main meter and check meter) are installed at metering yards at the project site. The meters are electronic trivector meters of 0.2 accuracy class. Five WTGs with location numbers OS 51, OS 54, OS 56, OS 57, OS 58 are connected to a single metering point and one WTG with location number OS 50 is connected to another metering point. The export and import of electricity would be measured from these onsite meters. Net electricity exported = Total electricity exported – Total electricity imported These values would be compared with the values provided by Joint Meter Readings / Statements on Break-up of Net Export Units prepared by the O&M Service provider, and the conservative value of the two would be considered for the emission reduction calculation. Calibration frequency: Yearly
Monitoring frequency	Monthly
QA/QC procedures	The quantity of net electricity supplied will be cross-verified from the invoices raised to the state electricity board. Further, cross-checking will be carried out using meters located at transformer yards.
Purpose of data	To determine Baseline Emissions
Additional comment	The data will be kept for two years after the crediting period or from last issuance. The values shall be monitored ex-post and CERs will be calculated at actual.

Data/Parameter	$EG_{p\ export,y}$
Data unit	MWh
Description	Electricity exported to the state electricity board by the project activity.
Source of data	Joint Meter Readings / Statements on Break-up of Net Export Units prepared by the O&M Service provider
Value(s) applied	15,650
Measurement methods and procedures	Electricity exported is monitored using digital energy meters of 0.2 accuracy class at the sub-station of the state electricity board. Joint meter readings of the energy meters will be carried out by representatives of the project promoter and representatives of the state electricity board on a monthly basis. The export readings will be apportioned based on the electricity generation from the individual WTGs connected to the substation. The apportioning procedure is under control of state electricity board and PP do not have any control on it. The PP have the values of export, import and net for their project activity and the same parameters are considered as monitoring parameters. The total electricity exported by the project activity is calculated as: • Total Electricity exported by Project activity = (Y/X)*A • (Electricity generated by the project activity(Y)/Total electricity generated by all WTGs connected to substation)(X)*(Total electricity exported by all WTGs connected to substation)(A)
Monitoring frequency	Monthly
QA/QC procedures	For cross verification, the invoices raised by the project proponent to the state electricity board for sale of electricity will be checked.
Purpose of data	To determine Baseline Emissions
Additional comment	The data will be kept for two years after the crediting period or from last issuance. The values shall be monitored ex-post and CERs will be calculated at actual.

Data/Parameter	$EG_{p\ import,y}$
Data unit	MWh
Description	Electricity imported from state electricity board by the project activity.
Source of data	Joint Meter Readings / Statements on Break-up of Net Export Units prepared by the O&M Service provider
Value(s) applied	-
Measurement methods and procedures	Electricity imported is monitored using digital energy meters of 0.2 accuracy class at the sub-station of the state electricity board. Joint meter readings of the energy meters will be carried out by representatives of the project promoter and representatives of the state electricity board on a monthly basis. The export readings will be apportioned based on the electricity generation from the individual WTGs connected to the substation. The apportioning procedure is under control of state electricity board and PP do not have any control on it. The PP have the values of export, import and net for their project activity and the same parameters are considered as monitoring parameters. The total electricity exported by the project activity is calculated as: • Total Electricity exported by Project activity = (Y/X)*A • (Electricity generated by the project activity(Y)/Total electricity generated by all WTGs connected to substation)(X)*(Total electricity exported by all WTGs connected to substation)(A)
Monitoring frequency	Monthly
QA/QC procedures	For cross verification, the invoices raised by the project proponent to the state electricity board for sale of electricity will be checked.
Purpose of data	To determine Baseline Emissions
Additional comment	The data will be kept for two years after the crediting period or from last issuance. The values shall be monitored ex-post and CERs will be calculated at actual.

B.7.2. Sampling plan

No sampling approach has been used

B.7.3. Other elements of monitoring plan

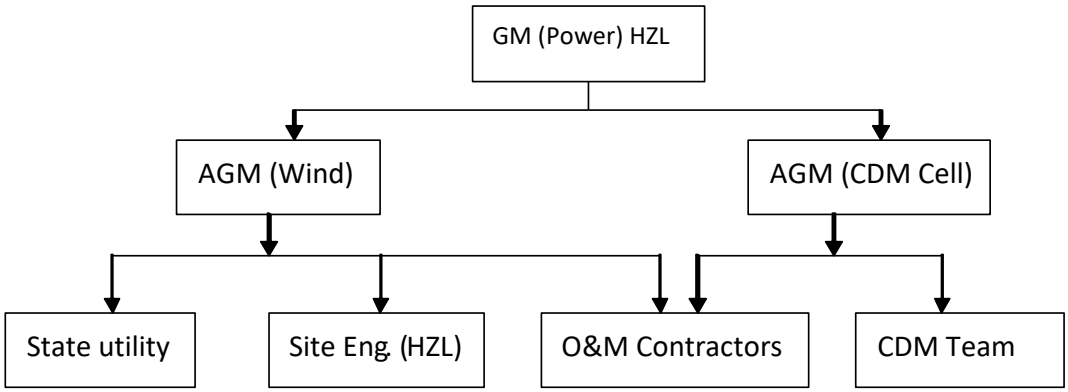
The purpose of the monitoring plan is to define the organizational structure of the monitoring team, monitoring practices, QA / QC procedures and archiving procedures. The monitoring plan aims to ensure that the emission reductions from the project activity are reported accurately and transparently.

Roles and Responsibilities of the Monitoring Team

The authority and responsibility of project management as well as registration, monitoring, measurement and reporting lies with HZL. The project proponent has formulated a Monitoring Team to ensure proper and continuous monitoring of the emission reductions as well as performance of turbines and generation of power.

To ensure trouble free operation of all the wind turbines, HZL has entered into a comprehensive Operation and Maintenance agreement with the manufactures of the turbines. The contractor, Suzlon Infrastructure Limited, would be responsible for the operation and maintenance of the WTGs. The O&M personnel are qualified engineers and are trained at the WEG manufacturing facility of Suzlon Infrastructure Limited.

The monitoring team will interact with the O&M contractors as well as the State Utility officials for executing the monitoring plan. The structure of the Monitoring Team is as follows:



Monitoring Team	Roles & Responsibilities
General Manager (Power), HZL	• Communication with CDM EB • Communication with State utility
AGM (CDM Cell), HZL	• Overall coordination with monitoring team and DOE for verification activities • Maintaining data records, documentation and archiving
CDM Team	• Assisting the General Manager (Wind) with overall coordination and with maintaining data records, documentation, archiving etc
AGM (Wind) HZL	• Coordinating with Site Engineer, O&M operators and State Utility.
Site Engineer, HZL	• Overseeing monitoring, operation and maintenance activities at site • Interacting with State Utility and O&M contractors for JMRs and calibration
O&M contractors	• Carrying out operation & maintenance of WTGs • Carrying out joint meter readings with state utility
State Utility	• Carrying out joing meter readings with representative of project proponent (O&M contractors • Calibration of energy meters

Metering Arrangements and Procedures

The general conditions set out for metering, recording, meter readings, meter inspections, Test & Checking and communication shall be as per the PPA (power purchase agreement). The electricity exported from the sub-station will be metered using electronic trivector meters.

On a monthly basis, a joint meter reading of the meter installed at substation will be carried out in the presence of the state electricity board officials and representatives of the project promoters.

Joint Metering Report (JMR) is generated based on readings from the meter installed at metering point at the sub-station of the state utility, from where the electricity is exported to the grid. The export and import readings of the JMR are then apportioned to account for the apportioned net electricity supplied by the project activity.

In addition to the metering point at the sub-station, for cross-checking purposes, there are energy meters located at transformer yards at the project site, which would be used for cross-checking purposes only. There are two transformer yards, consisting of a main and check meter of 0.2 accuracy class. Five WTGs with location numbers OS 51, OS 54, OS 56, OS 57, and OS 58 are connected to a single metering point and one WTG with location number OS 50 is connected to another metering point. Readings of these meters would be taken by representatives of the project proponent only.

The metering, feeder arrangement is under control of state electricity board and PP do not have any control on it. The meter locations, feeder arrangements may change during crediting period.

Apportioning Procedures for calculation of Net Electricity Supplied by the Project Activity

The net electricity supplied by the WTGs in the project activity to the grid is calculated based on export and import readings at the sub-station as well as generation data from individual WTGs. The main billing meter at substation records total export, and total import by all the WTGs connected to the substation. Additionally, the O&M contractors maintain records of the electricity generation from individual WTGs which is monitored through the SCADA system. This data is used for the apportioning of electricity export and import to individual WTGs.
The electricity export and import by the WTGs of HZL is calculated by using the following methodology.

Parameter	Figure	Unit
Gross electricity generated by all WEGs connected to substation of the state utility	X	MWh
Gross electricity generated by all WEGs owned by PP in project activity	Y	MWh
Share of all WEGs owned by PP in project activity in gross generation	(Y/X) %	%
Total electricity exported to the grid measured at the substation of the state utility	A	MWh
Total electricity imported from the grid measured at the substation of the state utility	B	MWh
Share of all WEGs owned by PP in project activity in total export	(Y/X) % * A	MWh
Share of all WEGs owned by PP in project activity in total import	(Y/X) % * B	MWh
Net export of all WEGs owned by PP in project activity	**[**(Y/X) % * A] – [(Y/X) % * B]	MWh

The above apportioning procedure is under control of state electricity board and PP do not have any control on it. The PP have the values of export, import and net for their project activity and the same parameters are considered as monitoring parameters.

Quality control and Quality Assurance procedures:
Calibration Procedures:

Main meters and check meters are installed for monitoring of the energy exported. The main and check meters shall be tested for accuracy every calendar year with reference to a portable standard meter. The meters shall be deemed to be working satisfactorily if the errors are within specifications for meters of 0.2 accuracy class. The data registered by the main meter alone will be adopted for the purpose of calculation as long as the error in the main meter is within permissible limits. If during the annual accuracy tests, the main meter is found to be within the permissible limit of error and the corresponding check meter is beyond the limits, the main meter reading shall be considered as usual. However, the check meter shall be calibrated immediately. If the main meter is found to be beyond the permissible limits of error, but corresponding check meter is within limits, then the check meter reading shall be adopted for that period. The main meter shall be calibrated immediately.

Apportioning Procedures in case the dates of monitoring period do not match with billing cycle dates

The monitoring period for the project activity may start from a date that does not coincide with the date of the initial reading of the respective JMR statement. For instance the monitoring period may start on the 20th of the month whereas the JMR Statement may report the net electricity generation data from the first of the month to the first of the next month. In such a scenario, the net electricity generation data from the start of the monitoring period to the first date of the next month (the apportioning period) would be determined as follows:

> Apportioned Net Electricity Generation = Apportioning Ratio X Net electricity generated as per JMR statement

The apportioning ratio would be determined as the ratio of the electricity generation at the WTG for the apportioning period to the electricity generation at the WTG for the entire period covered under the JMR statement. This procedure would only have to be followed for the first and last month of the monitoring period if the start and end dates do not coincide with the date of the joint meter readings of the energy meters.

Data collection and archiving

The daily data on electricity generation from WTGs at the site is collected in electronic form. Monthly JMR statements are collected and maintained in hard copy, and archived electronically. The project proponent shall keep complete and accurate records of all the data as a part of monitoring for at least a period of 2 years after the end of the crediting period or the last issuance of CERs for the project activity, whichever occurs later.

SECTION C. Start date, crediting period type and duration

C.1. Start date of project activity

The start date of the project activity is 28/03/2011, which corresponds to the date of purchase orders.

C.2. Expected operational lifetime of project activity

20 years and 0 months

C.3. Crediting period of project activity

C.3.1. Type of crediting period

Renewable crediting period

C.3.2. Start date of crediting period

01/12/2020 (Second crediting period)

C.3.3. Duration of crediting period

7 years, 0 months

SECTION D. Environmental impacts

D.1. Analysis of environmental impacts

As per the Ministry of Environment and Forests (Government of India) (now changed as Ministry of Environment and Forest and Climate Change, Govt. of India) notification the project activity does not fall under the purview of the Environmental impact Assessment thus the project activity is exempted from the environmental clearances. It should be noted here that though EIA is not a regulatory requirement in India for wind energy projects.

There are no negative environmental impacts that are envisaged due to the project activity. The following are the positive impacts due to the project activity.

- *Impact on air and water*: Wind energy is a form of renewable electricity generation; hence there would be no release of GHG into the atmosphere. Also as there is no fuel used for electricity generation no effluents or solid waste (such as ash) are generated.
- *Socio economic impact:* The project activity helps create demand for skilled and unskilled manpower in the region. The project provides employment opportunity to not only during the construction phase, but also during its operational life time. The project activity improves employment rate and livelihood of local populace in the vicinity of the project.

Moreover, the project generates eco-friendly, GHG free power, which contributes to sustainable development of the region.

D.2. Environmental impact assessment

The project activity i.e. electricity generation from wind, clean and green source of power which results in no negative impact on environment. Further as per the applicable regulation, the implementation of the wind park does not require an environmental impact assessment. The Ministry of Environment and Forests (MoEF), Government of India (now changed as Ministry of Environment and Forest and Climate Change, Govt. of India) notification dated 1 December 2009 regarding the requirement of Environment Impact Assessment (EIA) studies[18] states that any project developer in India needs to file an application to the Ministry of Environment and Forests (now changed as Ministry of Environment and Forest and

[18] As per the Environment Protection Rule, 1986 (Published in the Gazette of India, Extraordinary, Part-II, and Section 3, Sub-section (ii) MINISTRY OF ENVIRONMENT AND FORESTS) http://envfor.nic.in/legis/eia/so1533.pdf (accessed during registration of project activity and this document can view now at http://environmentclearance.nic.in/writereaddata/EIA_notifications/2006_09_14_EIA.pdf as on 24/11/2020)

Climate Change, Govt. of India) (including a public hearing and an EIA) in case the proposed industry or project is listed in a predefined list. Electricity generation from wind, are not included in this list and thus an EIA is not necessary.

Further amendments to the notification have been done on 14/07/2018. (EIA Notification 2018: http://www.egcipl.com/Doc/Gazzette%20Notification.pdf)

As per the notification:

"The following projects or activities shall require prior environmental clearance from the concerned regulatory authority, which shall hereinafter referred to be as the Central Government in the Ministry of Environment and Forests for matters falling under Category „A" in the Schedule and at State level the State Environment Impact Assessment Authority (SEIAA) for matters falling under Category „B" in the said Schedule, before any construction work, or preparation of land by the project management except for securing the land, is started on the project or activity:

(i) All new projects or activities listed in the Schedule to this notification;

(ii) Expansion and modernization of existing projects or activities listed in the Schedule to this

notification with addition of capacity beyond the limits specified for the concerned sector, that is, projects or activities which cross the threshold limits given in the Schedule, after expansion or modernization;

(iii) Any change in product - mix in an existing manufacturing unit included in Schedule beyond the specified range."

As the wind power generation projects are not listed in any of the categories of the schedule. So, the project is considered environmentally safe and as per Host party- India no EIA is required

SECTION E. Local stakeholder consultation

E.1. Modalities for local stakeholder consultation

The project activity being undertaken envisages the installation of a wind farm for supply to grid. The stakeholders for a project activity are defined as the public, including individuals, groups or communities, affected, or likely to be affected, by the proposed CDM project activity.

A meeting was organized by Suzlon Infrastructure Services Ltd. on 06/09/2011 Primary school, Govindpura, Osiyan, Jodhpur to inform the local stakeholders about the project activity and discuss their concerns, if any, regarding the project activity. Local stakeholders including Sarpanchs and residents of the neighbouring villages were invited to the meeting through a newspaper advertisement and a public notice.

The agenda of the meeting was as follows:

- Welcome Speech
- Introduction to Climate Change and Clean Development Mechanism
- Views expressed by the villagers
- Interactive session with the stakeholders
- Vote of Thanks

The representatives of Suzlon Infrastructure Services Ltd. and the project proponent presented the salient features of the project activity to the stakeholders. The opinions expressed by the local stakeholders and the respective responses were recorded.

E.2. Summary of comments received

A summary of comments and queries from the project participants and the stakeholders are presented below:

Comment / Query from Stakeholder	Response from Project Participant
Will this project enable the village to get an increased supply of power?	Once the electricity is generated, it is fed in to the state grid and then it becomes the decision of the state government as to where they have to give supply with respect to the amount of power at their disposal. We do expect that there would be increased supply of power.
This plan drawn up by the government for tapping the energy from the sun, will this lead to an increase in jobs for the villagers?	The plan drawn up by the government (National Action Plan on Climate Change) does signal the intentions of the government as to give a major thrust to solar power, but it is still too early to say how the government will exactly implement the plan that they have made. Nevertheless, plans of such a large scale do lead to generation of a number of jobs, Hence, we can expect employment generation from this too.

The stakeholders also expressed and acknowledged the socio-economic benefits of the project activity including improved infrastructure in the region, and employment opportunities for local residents.

E.3. Consideration of comments received

There were no concerns raised by the local stakeholders. The potential benefits of the project activity for the local stakeholders were acknowledged.

SECTION F. Approval and authorization

The Party involved in the project activity is India and it is involved indirectly. The Letter of Approval from the Designated National Authority for India i.e. National CDM Authority provided with reference of 4/6/2012-CCC dated 14/09/2012.
The other party involved is Australia and letter from Australia's DNA with reference of AUSCDM215/8103

Appendix 1. Contact information of project participants

Organization name	Hindustan Zinc Limited
Country	India
Address	CPP-CLZS, Chanderiya lead zinc smelter,Putholi, Chittorgarh-312021, Rajasthan
Telephone	91-9928140302, +91-1472-2564801
Fax	+91-1472-256593
E-mail	V.Jayaraman@vedanta.co.in
Website	-
Contact person	Mr. Jayaraman V.

Organization name	EKI Energy Services Ltd.
Country	India
Address	EnKing Embassy Office No. 201,Plot 48, Scheme 78, Part 2 ,Vijay Nagar-452010,MP India
Telephone	0731 428 9086
Fax	-
E-mail	naveen@enkingint.org
Website	https://www.enkingint.org/
Contact person	Mr. Naveen Sharma

Appendix 2. Affirmation regarding public funding

Not Applicable.

Appendix 3. Applicability of methodologies and standardized baselines

Please refer section B.2 of the PDD.

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

Please refer section B.6.3 of the PDD.

Appendix 5. Further background information on monitoring plan

The monitoring plan has been already explained in section B.7

Appendix 6. Summary report of comments received from local stakeholders

Please refer section E of the PDD

Appendix 7. Summary of post-registration changes

Not applicable

Document information

Version	*Date*	*Description*
11.0	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN); • Make editorial improvements.
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.

Version	*Date*	*Description*
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.
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