

Gold Standard for the Global Goals
Key Project Information & Project Design Document (PDD)



Version 1.1 – August 2017

KEY PROJECT INFORMATION

Title of Project:	Wind energy project by KWEPL - 3
Brief description of Project:	The project activity is a 31.2 MW Wind power project, promoted by Khandke Wind Energy Private Limited. The purpose of the project activity is to generate clean electricity with utilization of renewable Wind energy.
Expected Implementation Date: Expected duration of Project:	NA. (Commissioned) 20 years
Project Developer:	Khandke Wind Energy Private Limited
Project Representative:	Infinite Solutions
Project Participants and any communities involved:	Khandke Wind Energy Private Limited
Version of PDD: Date of Version:	02 28/03/2020
Host Country / Location:	India
Certification Pathway (Project Certification/Impact Statements & Products)	Impact statements & products
Activity Requirements applied: (mark GS4GG if none relevant)	Renewable Energy activity requirement
Methodologies applied:	ACM0002: Grid-connected electricity generation from renewable sources - Version 20.0
Product Requirements applied:	GHG Emissions Reductions & Sequestration Product Requirements
Regular/Retroactive:	Retroactive
SDG Impacts:	<ul style="list-style-type: none"> 1 - SDG 7 Affordable and Clean Energy 2 - SDG 8 Decent Work and Economic Growth 3 - SDG 13 Climate Action
Estimated amount of SDG Impact Certified	<ul style="list-style-type: none"> 1 - SDG 7- 62,205 MWh/year 2- SDG 8 - <ul style="list-style-type: none"> • Number (employees): 20 persons • Number(Trainings): Minimum 1 training. <p>The income to all the unskilled workers are made on day to day basis in line with minimum wage requirements.</p> 3- SDG 13 – 58,274 tCO_{2e} per annum

SECTION A. Description of project

A.1. Purpose and general description of project

The project activity is registered in CDM mechanism. Project CDM Ref number is 10040¹.

The project activity involves the generation of electricity from renewable wind power by installation of 39 Wind Turbine Generators (WTGs) at village Narmada of Anantpur district in the state of Andhra Pradesh, India. Each WTG has an installed capacity of 0.8 MW. The total installed capacity of the project is 31.2 MW. Project proponent has signed a power purchase agreement (PPA) to export the electricity to local grid.

Khandke Wind Energy Private Limited is the Project Participant / Developer and Infinite Solutions is the project Representative.

The process of generating power through wind resources is a clean technology, as there is no fossil fuel fired or no green house gases are emitted during the process.

The project displaces electricity from the Indian grid. This helps in significant reduction of GHG emissions as the Grid is mostly dependent on fossil fuel generated electricity. The estimated annual emission reduction is 58,274 tCO₂e per year.

The project activity is the installation of a new renewable wind power project and this is not a CPA that has been excluded from CDM PoA as a result of erroneous inclusion of CPAs.

Scenario existing prior to the implementation of the project activity

As the project activity is the installation of a new grid-connected renewable power plant/unit. The scenario existing prior to the implementation of project activity is 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, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system"

Baseline Scenario

Baseline scenario and Scenario existing prior to the implementation of the project activity are both same.

Sustainable Development

The National CDM Authority (NCDMA), which is the Designated National Authority (DNA) for the Government of India (GOI) under the Ministry of Environment, Forest and Climate Change (MoEFCC), has mentioned four indicators for the sustainable development in the interim approval guidelines for Clean Development Mechanism (CDM) projects from India. The project's contribution towards sustainable development has been addressed based on the following sustainable development aspects, in line with the requirements of the NCDMA:

➤ *Social well being*

The project activity will provide job opportunity to local people during erection, commissioning and maintenance of the Wind power project. Frequency of visiting to villages and nearby areas by skilled, technical and industrialist has increased due to installation /site visit/operation and maintenance work related to the project at plant site. This directly and indirectly positively effects the economy of nearby populace.

Business opportunities will be enhanced as a result of the project activity for manufacturers, contractors, suppliers etc. The project activity will also improve local infrastructure like connectivity of the area through the construction of roads to the site which will benefit the villagers located on and nearby these roads.

➤ *Environmental well being*

Wind power is one of the cleanest renewable energy powers and does not involve any fossil fuel. There are no GHG emissions associated with the Wind project.

¹ <https://cdm.unfccc.int/Projects/DB/RINA1411398002.62/view>

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The impact on land, water, air and soil is negligible. Thus the project activity contributes to environmental well-being without causing any negative impact on the surrounding environment.

➤ **Economic well being**

The project activity would help in alleviation of poverty in the area as it creates employment opportunities to the local people both temporary and permanent during the construction of the project as well as in operation.

The project activity will contribute significantly to the economical development of the region through land leases, permanent/temporary employment generation.

➤ **Technological well being**

The successful implementation of the project activity will result in encouraging the use of cleaner technology. This will lead to replacement of the non eco friendly sources of power generation like thermal energy which are the major sources of power in the country.

This will also give rise to increased interest in wind energy in the country. This in turn would push the investment into research into creating better technology.

A.2. Eligibility of the project under Gold Standard

The project activity meets the eligibility criteria as per section 3.1.1 of GS4GG Principles & Requirements document as described below.

- The project applies methodology ACM0002 Version 20, which is an approved methodology under Gold Standard.
- The project type is Wind which is an eligible project type as it is in accordance with 1.1.1 a) and 1.1.1 b) of the Eligible Project Types & Scope under Renewable Energy Activity Requirements.
- The project activity results in displacement of electricity from thermal power stations while contributing to sustainable development of India. Hence, the project contributes to the Gold Standard Vision and Mission.
- Wind projects are an approved project type and do not require further approval from Gold Standard.
- This project activity is not associated with geo-engineering or energy generated from fossil fuel or nuclear, fossil fuel switch, nor does it enhances or prolongs such energy generation.

General Eligibility Criteria under Renewable Energy Activity Requirements

Project Type : As discussed above, the project type is eligible.

Project Location : The project is located in India.

Project scale : The project activity is a 31.2 MW Wind power project and thus qualifies under Large scale projects.

Project is registered in CDM mechanism and can be checked on the webpage; <https://cdm.unfccc.int/Projects/DB/RINA1411398002.62/view>. Further the project is not registered with any other voluntary credit mechanism/schemes.

The start date for the project activity with capacity 31.2 MW is 23/08/2012 and The project proponent has (as per EB 62, paragraph 2, Annex 13) informed the Indian DNA and the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status. The form for prior consideration was submitted to the host DNA and UNFCCC on 28/12/2012 and 19/12/2012 respectively, which is within six months of the project activity start date.

However, the project proponent hereby confirms that there would not be double counting of credits for any particular monitoring period. The project is not registered under the REC mechanism of India and the same can be cross-checked at <https://recregistryindia.nic.in>.

A declaration mentioning the same will be submitted from the Project Developer.

A.3. Legal ownership of products generated by the project and legal rights to alter use of resources required to service the project

This is registered under CDM project and already commissioned. The project participants have the commissioning certificates which demonstrates that the PP as the legal owner. Thus the project participants

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Khandke Wind Energy Private Limited owner of the project and have the legal rights for the credits that shall be generated by this project activity.

A.4. Location of project

A.4.1. Host Country

India

A.4.2. Region/State/Province etc.

Andhra Pradesh

A.4.3. City/Town/Community etc.

District: Village Narmada of Anantpur district in the state of Andhra Pradesh

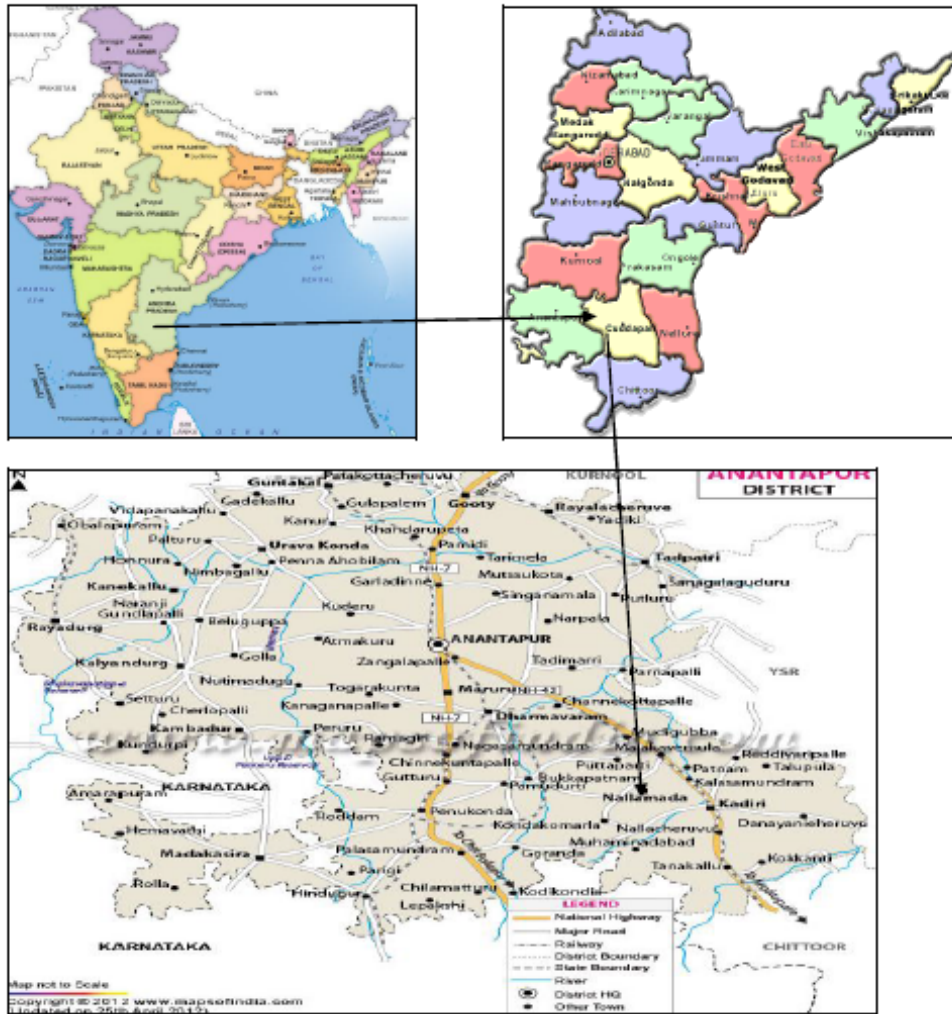
A.4.4. Physical/Geographical location

State: Andhra Pradesh

Country: India

S. No.	Phase No. with capacity	Commissioning Date
1	Phase 1 (2.4 MW)	18/04/2013
2	Phase 2 (3.2 MW) part 1	20/05/2013
3	Phase 2 (3.2 MW) part 2	22/06/2013
4	Phase 3 (4 MW)	25/07/2013
5	Phase 4 (2.4 MW)	30/08/2013
6	Phase 5 (8 MW)	01/10/2013
7	Phase 5 (8 MW)	30/11/2013

A pictorial representation of the location of the project activity on the map of India is provided as follows:



Project Location

A.5. Technologies and/or measures

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

The proposed project activity involves installation of 39 WEGs of 0.8 MW capacity each, i.e. total installed capacity of 31.2 MW and a PLF of 22.76 %. The WEGs are of Wind World model, WW-53, with newly designed blades, type tested and approved by the Ministry of New and Renewable Energy (MNRE). The specifications of the WEGs installed at each of the sites are specified below:

Parameter	Specification
Turbine Model	WW-53
Rated Power	800 kW
Rotor Diameter	52.9 m
Hub Height	75 m
Turbine type	Direct driven, horizontal axis wind turbine with variable rotor speed
Power Regulation	Independent pitch system for each blade
Cutin wind speed	3.0 m/s
Rated wind speed	12 m/s
Cutout wind speed	25 m/s

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Extreme wind speed	52.5 m/s
Rated rotational speed	29 rpm
Operating range rotational speed	11-29.5 rpm
Orientation	Upwind
Number of blades	3
Blade Material	Fibre glass epoxy reinforced
Gear box type	Gear less
Generator type	Synchronous generator
Braking	Aerodynamic
Output voltage	400 V
Yaw system	Active yawing with 4 electric yaw drives with brake motor
Tower	74 m (Concrete Tower)
Turbine life	20 years

The electricity generated by the project activity is being supplied to the grid.

Age and Technical Life Time:

Designed technical life time of project activity will be 20 years. This confirms project activity continues to displace electricity for the life time comparable to the baseline scenario noted.

The entire project of 31.2 MW capacity was commissioned in phases the dates of which and the project residual life are tabulated below:

S. No.	Phase No. with capacity	Commissioning Date	Residual life till
1	Phase 1 (2.4 MW)	18/04/2013	17/04/2033
2	Phase 2 (3.2 MW) part 1	20/05/2013	19/05/2033
3	Phase 2 (3.2 MW) part 2	22/06/2013	21/06/2033
4	Phase 3 (4 MW)	25/07/2013	24/07/2033
5	Phase 4 (2.4 MW)	30/08/2013	29/08/2033
6	Phase 5 (8 MW)	1/10/2013	01/10/2033
7	Phase 5 (8 MW)	30/11/2013	29/11/2033

Project activity is a registered CDM project and its CDM crediting period is from 28 Oct 14 - 27 Oct 24 (Fixed). Hence, the GS crediting period end date is restricted till 27 Oct 24 only i.e for the residual CDM crediting period which is within the residual technical lifetime of the project WTGs. Please refer section C for further details.

The project activity is expected to export 62,205 MWh annually of electrical energy, throughout its entire life span of 20 years. This will result in average annual reduction of 58,274 tCO₂ per annum from the project activity. The project activity does not involve any technology transfer.

Baseline Scenario

As the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following as per applied methodology: "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, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system".

Hence, pre-project scenario and baseline scenario are the same.

Purpose of the Project

The purpose of the project activity is to generate electrical power using Wind energy, there by displacing non-renewable fossil resources resulting to sustainable, economic and environmental development. In the absence of the project activity equivalent amount of power generation would have taken place through fossil fuel dominated power generating stations. Thus the renewable energy generation from project activity will result in reduction of the greenhouse gas emissions.

Positive contribution of the project to the following Sustainable Development Goals

1. **SDG13: Climate Action** : The project would lead to reduction of approx. 58,274 tCO₂ per annum due to implementation of project activity.
2. **SDG 7: Affordable and Clean Energy** : The project is generating approx 62,205 MWh of clean energy per annum.
3. **SDG 8: Decent Work and Economic Growth** : The project is providing direct employment to around 10 persons. The project leads to Trainings & workshops which are conducted for the O&M staff of the PP.

A.6. Scale of the project

Renewable energy project activities with a maximum output capacity of 15 megawatts (or an appropriate equivalent) are small scale project activity and project activities of more than 15 MW are considered as large-scale CDM project activity.

As the project activity is of 31.2 MW capacity, hence clearly it is Large Scale project.

A.7. Funding sources of project

The PP hereby confirms that there is no public funding from Annex 1 countries and no diversion of Official Development Assistance (ODA) involved in the project activity.

A.8. Assessment that project complies with 'gender sensitive' requirements

Question 1: Does the project reflect the key issues and requirements of Gender Sensitive design and implementation as outlined in the Gender Policy? Explain how.

Response: As per Gold Standard Gender Policy, para 4.2 (i) "*Foundational gender-sensitive requirement - This strengthens Gold Standard's 'do no harm' approach and addresses safeguards to prevent or mitigate adverse impacts on women or men and girls and boys. Such action is mandatory for all projects seeking Gold Standard certification and includes compliance with the gender 'do no harm' safeguards, gender gap analysis and gender sensitive stakeholder consultations.*" The project being a renewable energy project is not gender sensitive project. The project does not adversely impact women or men.

Question 2: Does the project align with existing country policies, strategies and best practices? Explain how.

Response: India is party to "Convention on the Elimination of All Forms of Discrimination against Women²" and the project has aligned its policies which does not discriminate on gender.

Question 3: Does the project address the questions raised in the Gold Standard Safeguarding Principles & Requirements document? Explain how.

Response: The Project shall complete the following gender assessment questions below:

1. *Is there a possibility that the Project might reduce or put at risk women's access to or control of resources, entitlements and benefits?* No, the Project being a wind project does not reduce access to or control of resources for women.
2. *Is there a possibility that the Project can adversely affect men and women in marginalised or vulnerable communities (e.g., potential increased burden on women or social isolation of men)?* No, the Project beneficiaries in terms of employment and social upliftment of the area are common for both the gender.
3. *Is there a possibility that the Project might not take into account gender roles and the abilities of women or men to participate in the decisions/designs of the project's activities (such as lack of time, child care duties, low literacy or educational levels, or societal discrimination)?* No, the CSR activities that are planned to be carried out by the project proponent shall be discussed with the community, consisting both the genders, before the actual implementation.
4. *Does the Project take into account gender roles and the abilities of women or men to benefit from the Project's activities (e.g., Does the project criteria ensure that it includes minority groups or landless peoples)?*

2 <http://hrlibrary.umn.edu/research/ratification-india.html>

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Yes the project takes into account gender roles and abilities of women/men. Job profile is allocated based on the type of work to be carried out.

5. *Does the Project design contribute to an increase in women's workload that adds to their care responsibilities or that prevents them from engaging in other activities?* No, on the contrary the project leads to increased availability of electricity in the regional grid thereby uplifting the living standards.
6. *Would the Project potentially reproduce or further deepen discrimination against women based on gender, for instance, regarding their full participation in design and implementation or access to opportunities and benefits?* No, since the project is a renewable electricity generation project, thus it will not have discriminated against women.
7. *Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and priorities of women and men in accessing and managing environmental goods and services?* No, in fact, the project leads to improved electricity in the regional grid thereby leading to less usage of fuel for lighting.
8. *Is there a likelihood that the proposed Project would expose women and girls to further risks or hazards?* No, in fact, due to improved electricity availability the usage of fuel for lighting would be reduced as well as indoor air quality would be improved.

Question 4: Does the project apply the Gold Standard Stakeholder Consultation & Engagement Procedure Requirements? Explain how.

Response: Since the project is applying retroactively for GS registration, a Stakeholder Feedback round shall be carried out at a later stage.

However, the Stakeholders' Meet was conducted Wind World India Limited, Near MG Metallic Spring Factory, Back side of Apollo Tyres, Bellary Road, Anantpur, Andhra Pradesh – 515001 on 10/05/2013. The project representative explained how such power projects help in providing clean energy and thereby help in mitigating impacts due to Global Warming and the impacts of Wind power projects which lead to providing clean energy, increase in employment opportunities both long term and short term, increased income and thereby leading to improvement in living standard of the people. The stakeholders shared full support for the Wind power project operations.

SECTION B. Application of selected approved Gold Standard methodology

B.1. Reference of approved methodology

Title : Grid-connected electricity generation from renewable sources.

References : Approved Large Scale Consolidated Methodology: ACM0002 "Grid-connected electricity generation from renewable sources" (Version 20, EB 105)³

ACM0002 draws upon the following tools which have been used in the PDD:

- Methodological Tool: Tool to calculate the emission factor for an electricity system - Version 07.0⁴
- Methodological Tool: Tool for the demonstration and assessment of additionality - Version 07.0.0⁵

B.2. Applicability of methodology

As per para 2 of ACM0002 (Version 20), "This methodology applies to project activities that include retrofitting, rehabilitation (or refurbishment), replacement or capacity addition of an existing power plant or construction and operation of a Greenfield power plant".

The project activity meets the applicability conditions of the approved consolidated baseline and monitoring methodology ACM0002, Version 20 for Greenfield projects as described below:

The project activity meets the applicability conditions of the approved methodology, Sectoral Scope 1 for Greenfield projects as described below:

³ <https://cdm.unfccc.int/methodologies/DB/XP2LKUSA61DKUQC0PIWPGWWDN8ED5PG>

⁴ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v7.0.pdf>

⁵ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-01-v7.0.0.pdf>

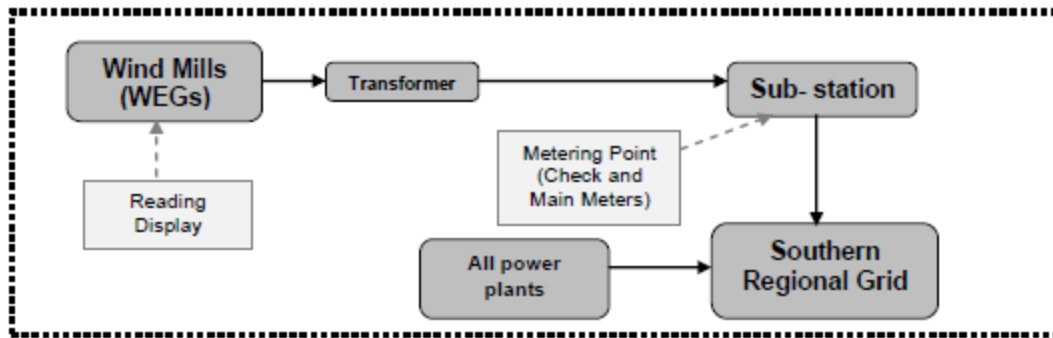
Applicability	Project activity vis-à-vis applicability Conditions
<p>This methodology is applicable to grid-connected renewable energy power generation project activities that:</p> <ul style="list-style-type: none"> (a) Install a Greenfield power plant; (a) Involve a capacity addition to (an) existing plant(s); (b) Involve a retrofit of (an) existing operating plants/units; (c) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (d) Involve a replacement of (an) existing plant(s)/unit(s). 	<p>The project activity is installation of a new grid connected Wind power plant/ unit at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant) and hence this criterion is applicable.</p>
<p>The methodology is applicable under the following conditions:</p> <ul style="list-style-type: none"> (a) The project activity may include renewable energy power plant/unit of one of the following types: hydro power plant/unit with or without reservoir, wind power plant/unit, geothermal power plant/unit, wind power plant/unit, wave power plant/unit or tidal power plant/unit; (b) In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, wind, wave or tidal power capacity addition projects the existing plant/unit started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity. 	<p>The proposed project activity is an installation of a new grid connected Wind power plant/ unit and hence criteria under point (a) is met.</p> <p>The project does not involve any capacity additions, retrofits or replacements and therefore this criteria under point (b) is not applicable.</p>
<p>In case of hydro power plants, one of the following conditions shall apply:</p> <ul style="list-style-type: none"> (a) The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or (b) The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density calculated using equation (3), is greater than 4 W/m^2 ; or (c) The project activity results in new single or multiple reservoirs and the power density, calculated using equation (3), is greater than 4 W/m^2 ; or (d) The project activity is an integrated hydro power project involving multiple reservoirs, where the power density for any of the reservoirs, calculated using equation (3), is lower than or equal to 4 W/m^2 , all of the following conditions shall apply: <ul style="list-style-type: none"> (i) The power density calculated using the total installed capacity of the integrated project, as per equation (4), is greater than 4 W/m^2 ; (ii) Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity; (iii) Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m^2 shall be: <ul style="list-style-type: none"> a. Lower than or equal to 15 MW; and b. Less than 10 per cent of the total installed capacity of integrated hydro power project. 	<p>The proposed project activity is an installation of a new grid connected Wind power plant/ unit and not Hydro power plant, therefore this criteria is not applicable for this project activity.</p>
<p>In the case of integrated hydro power projects, project proponent shall:</p> <ul style="list-style-type: none"> • Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or • Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water 	<p>The proposed project activity is an installation of a new grid connected Wind power plant/ unit and not Hydro power plant, therefore this criteria is not applicable for this project activity.</p>

<p>balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum five years prior to implementation of CDM project activity.</p>	
<p>The methodology is not applicable to:</p> <p>(a) Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site;</p> <p>(b) Biomass fired power plants/units.</p>	<p>The project activity is installation of a new grid connected Wind power project/ unit and does not involve switching from fossil fuel to renewable energy, therefore criterion described in point (a) is not relevant to the project activity. This is a Wind power plant/ unit and not a biomass fired plant, therefore criterion described in point (b) is not applicable to the project activity.</p>
<p>In the case of retrofits, rehabilitations, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is “the continuation of the current situation, that is to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance”.</p>	<p>The project activity is a new grid connected Wind power plant/ unit and not a retrofits, replacement or capacity additions and therefore this criterion is not applicable to the project activity.</p>
<p>Applicability conditions of “Tool to calculate the emission factor for an electricity system”, - Version 07.0</p>	
<p>This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).</p>	<p>This condition is applicable. OM, BM and CM are estimated using the tool under section B.6.3 for calculating baseline emissions.</p>
<p>Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants. In the latter case, two sub-options under the step 2 of the tool are available to the project participants, i.e. option IIa and option IIb. If option IIa is chosen, the conditions specified in “Appendix 2: be met. Namely, the total capacity of off-grid Procedures related to off-grid power generation” should power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity.</p>	<p>Since the project activity is grid connected, this condition is applicable and the emission factor has been calculated accordingly.</p>
<p>In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.</p>	<p>The project activity is located in India, a non-Annex I country. Therefore, this criterion is not applicable for the project activity.</p>
<p>Under this tool, the value applied to the CO₂ emission factor of biofuels is zero.</p>	<p>The project activity is a grid connected wind power project/ unit and does not involve emission from biofuels. Therefore, this criterion is not applicable.</p>

B.3. Project boundary

As per the methodology, “the spatial extent of the project boundary includes the project site and all power plants connected physically to the electricity system that the project power plant is connected to.”

The proposed project would be feeding the electricity in the Indian grid. Thus, all the power generation facilities connected to this grid form the project boundary for the purpose of baseline estimation.



Source		GHGs	Included?	Justification/Explanation
Baseline scenario	Grid connected electricity generation	CO ₂	Yes	Main emission source
		CH ₄	No	Minor emission source
		N ₂ O	No	Minor emission source
Project scenario	Greenfield Wind Power Project Activity	CO ₂	No	No CO ₂ emissions are emitted from the project activity
		CH ₄	No	No, Project Activity does not emit CH ₄
		N ₂ O	No	No, Project Activity does not emit N ₂ O

B.4. Establishment and description of baseline scenario

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

The project activity involves setting up of WTGs plant to harness the power generation from wind 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.

As per applicable methodology the baseline emissions are the product of electrical energy baseline $EG_{BL, y}$ expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission factor.

The combined margin ($EF_{grid, CM, y}$) is the result of a weighted average of two emission factor pertaining to the electricity system: the operating margin (OM) and build margin (BM), in accordance with the Tool to calculate the emission factor for an electricity system - Version 7. Calculations for this combined margin must be based on data from an official source (where available) and made publically available. In India, Central Electricity Authority (CEA), Government of India provides this data, and accordingly the same has been used.

Parameter	Value	Nomenclature	Source
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EF _{grid,CM,y}	0.9368 tCO ₂ /MWh	Combined margin CO ₂ emission factor for the project electricity system in year y as per latest available data Sources	Calculated as the weighted average of the operating margin (0.75) & build margin (0.25) values, sourced from Baseline CO ₂ Emission Database, Version 14 ⁶ published by Central Electricity Authority (CEA), Government of India in Dec 2018 which is the latest available.
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B.5. Demonstration of additionality

The table below is only applicable if the proposed project is deemed additional, as defined by the applied approved methodology or activity requirement or product requirement.

Specify the methodology or activity requirement or product requirement that establish deemed additionality for the proposed project (including the version number and the specific paragraph, if applicable).	Not Applicable
Describe how the proposed project meets the criteria for deemed additionality.	Not Applicable

The CDM project generates power using wind energy which is a renewable, zero emission source of energy. Baseline considerations for the project are based on approved methodology ACM0002 (Version 20.0).

The project is registered under CDM; hence refer CDM PDD section B.5 for additionality.

B.6. Sustainable Development Goals (SDG) outcomes

B.6.1. Relevant target for each of the three SDGs

Item	Goals and Targets	Indicators
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⁶http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver14.pdf

SDG 7: Affordable and Clean Energy	7.2: By 2030, increase substantially the share of renewable energy in the global energy mix	7.2.1: Renewable energy share in the total final energy consumption
	Target: 62,205 MWh per annum	
SDG 8: Decent Work and Economic Growth	8.6: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value	8.6.1: Average hourly earnings of female and male employees, by occupation, age and persons with disabilities
	Target: <ul style="list-style-type: none"> • Training: 1 nos annually • Employment of 20 staff 	
SDG 13: Climate Action	13.2: Integrate climate change measures into national policies, strategies and planning	13.2.1: Number of countries that have communicated establishment or operationalization of an integrated policy/ strategy/ plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production (including a national adaptation plan, nationally determined contribution, national communication, biennial update report or other)
	Target: 58,274 tCO ₂ per annum	

B.6.2. Explanation of methodological choices/approaches for estimating the SDG outcome

The company shall conduct regular surveys during construction as well as O&M phases in the villages near project locations to check the requirement of facilities by the villages. Based on the surveys, PP shall identify and works on several scope(s) of developmental activities such as health camps, distribution of furniture & sports kits in schools, toilet requirements in government schools, drinking water requirements etc. For this project activity, following SDGs are expected to be impacted:

SDG 7 : Affordable and Clean Energy

The baseline for the project is no project, thus leading to generation in the relevant grid which is dominated by fossil fuel. The clean energy generated by the project is calculated based on the amount of electricity generated by the project per annum. The project is expected to generate 62,205 MWh of clean energy per annum.

SDG 8: Decent Work and Economic Growth

The project leads to Trainings & workshops which are conducted for the O&M staff of the PP. It is expected that a minimum of 1 training (either of the above) would be carried out annually.

The project will also provide employment to approximately 20 persons including O&M staff, management, outsourced jobs as well as security guards during the O&M phase.

SDG13 : Climate Action :

The project leads to mitigation of 58,274 tCO₂ per annum.

As per the approved consolidated Methodology ACM0002 (Version 20), Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

Where:

ER_y = Emission reductions in year y (t CO₂e/yr)

BE_y = Baseline emissions in year y (t CO₂/yr)

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PE_y = Project emissions in year y (t CO₂e/yr)

Baseline Emissions:

Baseline Emissions for the amount of electricity supplied by project activity, BE_y is calculated as

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

Where:

BE_y = Baseline emissions in year y (t CO₂/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)

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

Calculation of $EG_{PJ,y}$

The calculation of $EG_{PJ,y}$ is different for

- Greenfield plants,
- Retrofits and replacements, and
- Capacity additions

The project activity is the installation of windmills and it is a green field project. So the formula in option (a) i.e., greenfield plants is used to calculate the value of $EG_{PJ,y}$. In accordance with para 46 of the applied methodology:

$$EG_{PJ,y} = EG_{facility,y}$$

Where:

$EG_{PJ,y}$ = 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)

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

The proposed project activity falls under Indian grid, which constitutes of both fossil fuels and non-fossil fuels sources of electricity generation. Emission reductions due to the project activity are considered to be equivalent to the baseline emissions, since the Wind project would not lead to any project emission and leakage emissions. Emission reductions are related to the electricity exported by the project and the emission coefficient of the grid system.

Baseline emission factor is calculated as combined margin, consisting of a combination of operating margin and build margin factors according to the procedures prescribed in the latest tool for calculating the emission factor for an electricity system. The steps of calculation are as follows:

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".

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

Option I is opted for the project activity i.e. only grid connected power plants are included in the calculation.

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

According to the tool, the calculation of the operating margin emission factor is based on one of the following methods:

- Simple OM; or
- Simple adjusted OM; or
- Dispatch data analysis OM; or
- Average OM.

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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 Wind generation.

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

	2013-14	2014-15	2015-16	2016-17	2017-18
India	18.6%	16.8%	15.1%	14.6%	14.3%

Data Source: Central Electricity Authority (CEA) database Version 14, Dec'2018

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.

The simple OM emission factor is calculated as the generation-weighted average CO₂ emissions per unit net electricity generation (t CO₂/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.

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 CDM-PDD to the DOE for validation.

OM determined at validation stage will be the same throughout the crediting period. There will be no requirement to monitor & recalculate the emission factor during the crediting period.

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

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

Net Generation in Operating Margin (MWh) (incl. Imports)			
	2015-16	2016-17	2017-18
Indian Grid	871,753	916,278	960,693

Simple Operating Margin (tCO ₂ /MWh) (incl. Imports)			
	2015-16	2016-17	2017-18
Indian Grid	0.9655	0.9636	0.9543

Weighted Generation Operating Margin	
Indian Grid	0.9610

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

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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 CDM-PDD submission to the DOE for validation. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE. For the third crediting period, 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 to calculate the build margin emission factor for the project activity. BM is calculated ex-ante based on the most recent information available at the time of submission of PDD and is fixed for the entire crediting period

Build Margin (tCO₂/MWh) (not adjusted for imports)	
	2017-18
Indian Grid	0.8644

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:

$$EF_y = EF_{grid,OM,y} * w_{OM} + EF_{grid,BM,y} * w_{BM}$$

Where:

- $EF_{grid,BM,y}$ = Build margin CO₂ emission factor in year y (t CO₂/MWh)
- $EF_{grid,OM,y}$ = Operating margin CO₂ emission factor in year y (t CO₂/MWh)
- w_{OM} = Weighting of operating margin emissions factor (per cent)
- w_{BM} = Weighting of build margin emissions factor (per cent)

According to "Tool to calculate the emission factor for an electricity system" the weights for OM and BM are 0.75 and 0.25 respectively.

$$\begin{aligned} \text{Therefore, } EF_{grid,CM,y} &= 0.9610 * 0.75 + 0.8644 * 0.25 \\ &= 0.9368 \text{ t CO}_2/\text{MWh} \end{aligned}$$

As per, CDM PDD, According to the 'Tool to calculate the emission factor for an electricity system', version 2, the weights for OM and BM are 0.75 and 0.25 respectively. Using the values for operating and build margin emission factor provided in the CEA database version 14 and their respective weights for calculation of

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combined margin emission factor, the baseline carbon emission factor (CM) was calculated: 0.9368 tCO_{2e}/MWh.

Hence, being conservative lower emission factor i.e. emission factor calculated in CDM PDD was considered for calculation of baseline emission.

Please refer ER calculation sheet for detailed calculation.

Project Emission

As per the ACM0002 ver-20, Project Emission for most renewable energy power generation project activities, PE_y = 0. However, some project activities may involve project emissions that can be significant. These emissions shall be accounted for as project emissions by using the following equation:

$$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$$

Where:

PE_y = Project emissions in year y (tCO_{2e}/yr)

PE_{FF,y} = Project emissions from fossil fuel consumption in year y (tCO₂/yr)

PE_{GP,y} = Project emissions from the operation of geothermal power plants due to the release of non condensable gases in year y (tCO_{2e}/yr)

PE_{HP,y} = Project emissions from water reservoirs of hydro power plants in year y (tCO_{2e}/yr).

The project activity involves the generation of electricity from the installation of WTGs. Hence, as per ACM0002, Version 20, there is no project emission for windmill projects. Therefore, project emissions are zero.

Leakage Emissions

No leakage emissions are considered in the project activity. The emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, transport). Since the emissions sources are small, it is neglected.

B.6.3. Data and parameters fixed ex ante for monitoring contribution to each of the three SDGs

Relevant SDG Indicator	SDG13 : Climate Action
Data/parameter	EF _{OM,y}
Unit	tCO _{2e} /MWh
Description	Operating Margin Emission Factor (This is the weighted average of operating margin of the Grid for the most recent 3 years for which data are available at the time of CDM PDD submission)
Source of data	Calculated from CEA database, Version 4
Value(s) applied	0.9610 (Detail Calculation has been provided in ER Sheet)
Choice of data or Measurement methods and procedures	The data are obtained from "CO ₂ Baseline Database for Indian Power Sector" version 14.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of data	The data is used to calculate baseline emission reductions.
Additional comment	This parameter is fixed ex-ante for the entire crediting period.

Relevant SDG Indicator	SDG13 : Climate Action
Data/parameter	EF _{BM, y}
Unit	tCO _{2e} /MWh
Description	Build Margin Emission Factor
Source of data	CEA database, Version4
Value(s) applied	0.8644

Choice of data or Measurement methods and procedures	The data are obtained from “CO2 Baseline Database for Indian Power Sector” version 14.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of data	The data is used to calculate baseline emission reductions.
Additional comment	This parameter is fixed ex-ante for the entire crediting period.

Relevant SDG Indicator	SDG13 : Climate Action
Data/parameter	$EF_{CM, y}$
Unit	tCO _{2e} /MWh
Description	Combined Margin Emission Factor
Source of data	Calculated from CEA database, Version 04
Value(s) applied	0.9368
Choice of data or Measurement methods and procedures	Calculated as per “Tool to calculate the emission factor for an electricity system”. The data is obtained from “CO2 Baseline Database for Indian Power Sector” version 14.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of data	The data is used to calculate baseline emission reductions.
Additional comment	-

B.6.4. Ex ante estimation of outcomes linked to each of the three SDGs

>>

SDG 7: Affordable and Clean Energy - Project expected to generate 62,205 MWh clean energy every year

SDG 8: Decent Work and Economic Growth - Minimum 1 training to be carried out annually, apart from providing employment to approximately 20 persons.

SDG13 : Climate Action - The project leads to mitigation of 58,274 tCO₂ per annum.

Calculation of Outcome for SDG13 : Climate Action

Baseline emissions

The baseline emissions are the product of electrical energy baseline $EG_{PJ,y}$ expressed in MWh of electricity produced by the renewable generating unit multiplied by an emission factor.

$$BE_y = EG_{PJ, facility, y} * EF_{grid, CM, y}$$

Where,

$EG_{PJ, facility, y}$ = Total quantity of net electricity delivered to the Indian grid.

$EF_{grid, CM, y}$ = Combined margin CO₂ emission factor for grid connected power generation in year y
= 0.9368 t CO₂/MWh.

Project Participant	Capacity	PLF (%)	Generated Power (MWh/year)	Baseline Emission Factor (tCO ₂ /MWh)	Baseline emissions (tCO ₂ / year)
Khandke Wind Energy Private Limited	31.2 MW	22.76%	62,205	0.9368	58,274

$$BE_y = 62,205 * 0.9368 \text{ t CO}_2/\text{year} = 58,274 \text{ tCO}_2/\text{year}$$

Project emissions

$$PE_y = 0$$

Leakage

No leakage emissions are applicable.

Emission reductions

B.6.5. Summary of ex ante estimates of each SDG outcome

SDG 7: Affordable and Clean Energy

Year	Baseline estimate	Project estimate	Net benefit
Year 1	0 MWh	62,205 MWh	62,205 MWh
Year 2	0 MWh	62,205 MWh	62,205 MWh
Year 3	0 MWh	62,205 MWh	62,205 MWh
Year 4	0 MWh	62,205 MWh	62,205 MWh
Year 5	0 MWh	62,205 MWh	62,205 MWh
Total	0 MWh	311,029 MWh	311,029 MWh
Total number of crediting years	5		
Annual average over the crediting period	0 MWh	62,205 MWh	62,205 MWh

The proposed project activity falls under Indian grid, which constitutes of both fossil fuels and non-fossil fuels sources of electricity generation hence in baseline, the affordable and Clean Energy generated was 0. Since the project is a Wind energy project, therefore the Affordable and Clean Energy produced by the project is 62,205 MWh per year.

SDG 8: Decent Work and Economic Growth

Year	Baseline estimate	Project estimate	Net benefit
Year 1	0 Training, 0 Jobs	1 Training, 10 Jobs	1 Training, 10 Jobs
Year 2	0 Training, 0 Jobs	1 Training, 10 Jobs	1 Training, 10 Jobs
Year 3	0 Training, 0 Jobs	1 Training, 10 Jobs	1 Training, 10 Jobs
Year 4	0 Training, 0 Jobs	1 Training, 10 Jobs	1 Training, 10 Jobs
Year 5	0 Training, 0 Jobs	1 Training, 10 Jobs	1 Training, 10 Jobs
Total	0 Training, 0 Jobs	5 Trainings, 10 Jobs	5 Trainings, 10 Jobs
Total number of crediting years	5		
Annual average over the crediting period	0 Training, 0 Jobs	1 Training, 10 Jobs	1 Training, 10 Jobs

There was no training in the baseline however the training and jobs generated by the project activity is 3 and 10 jobs.

SDG13 : Climate Action

Year	Baseline estimate	Project estimate	Net benefit
Year 1	58,274 tCO ₂	0 tCO ₂	58,274 tCO ₂
Year 2	58,274 tCO ₂	0 tCO ₂	58,274 tCO ₂
Year 3	58,274 tCO ₂	0 tCO ₂	58,274 tCO ₂
Year 4	58,274 tCO ₂	0 tCO ₂	58,274 tCO ₂
Year 5	58,274 tCO ₂	0 tCO ₂	58,274 tCO ₂
Total	291,370 tCO ₂	0 tCO ₂	291,370 tCO ₂
Total number of crediting years	5		

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Annual average over the crediting period	58,274 tCO ₂	0 tCO ₂	58,274 tCO ₂
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The proposed project activity falls under Indian grid, which constitutes of both fossil fuels and non-fossil fuels sources of electricity generation hence in baseline, the estimated emission is 58,274 tCO₂ per year. Since the project is Wind energy project, therefore the project does not emit any GHG.

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

Relevant SDG Indicator	SDG 7.2.1 : Affordable and Clean Energy
Data / Parameter	EG _y
Unit	MWh
Description	Total Net electricity exported to grid
Source of data	Credit notes from the state electricity utility
Value(s) applied	62,205
Measurement methods and procedures	Monitoring: Electrical Energy Meters which are electronic tri-vector meters of accuracy class 0.2 (Main & Check meters) Data type: Measured & Calculated $EG_y = EG_{\text{export}} - EG_{\text{import}}$ Archiving: Paper & Electronic Recording Frequency: Daily Responsibility: The O&M site-in-charge shall be responsible for the regular recording of data.
Monitoring frequency	Continuous measurement and monthly recording
QA/QC procedures	The meters will be calibrated once in every 5 years by an independent testing laboratory.
Purpose of data	The Data/Parameter is required to calculate the baseline emission
Additional comment	The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later. In the case of the crediting period start & end dates of the project activity falls in – between the billing cycles, then for emission reduction calculations, the daily generation reports provided by the O&M service provider, shall be considered

Relevant SDG Indicator	SDG 8.5.1: Decent Work and Economic Growth
Data / Parameter	<ul style="list-style-type: none"> Quantitative employment, Quality of employment Income generation
Unit	<ul style="list-style-type: none"> Number(Trainings) Number (employees) INR (salary)
Description	<ul style="list-style-type: none"> Number of Trainings provided to employees & O&M staff Number of project employees with Number of male/female, permanent/temporary, age and person with disabilities. Salary given to the employees of the project. <p>The income to all the unskilled workers are made on day to day basis in line with the minimum wage requirements. Annual records of income paid to all the employees would be available.</p>

Source of data	Training Records (HSE & HR) Salary of the project employees.
Value(s) applied	The trainings & workshops will be given to the O&M staff are: <ul style="list-style-type: none"> • HSE Training Record • Soft Skill Training <p>It is expected that a minimum of 1 training (either of the above) would be carried out annually.</p> <p>The training programmes help in making the workforce efficient and skilled at their job. This not only helps the company but adds to growth of individual employees. Thus, the project has a positive impact on the parameter.</p>
Measurement methods and procedures	<ul style="list-style-type: none"> • Training Attendance sheets. • Employee Records • Salary Record of the employees
Monitoring frequency	Once in a Monitoring period
QA/QC procedures	The number of persons employed would be mentioned in the plant register, which can be crossed checked with daily attendance register. Salary slip can be checked for earnings of employees
Purpose of data	Continuation of regular trainings/workshops for employees & O&M staff
Additional comment	-

Relevant SDG Indicator	SDG13.2.1 : Climate Action
Data / Parameter	Air quality
Unit	tCO ₂
Description	Reduction in CO ₂ emission reduction due to implementation of project activity
Source of data	Calculated as per "Tool to calculate the emission factor for an electricity system,". The data are obtained from "CO ₂ Baseline Database for Indian Power Sector" version 14.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Value(s) applied	58,274 tCO ₂ emission reductions estimated per annum
Measurement methods and procedures	Calculated from CEA database and Energy Generation
Monitoring frequency	The energy meters will be calibrated once in every 5 years by an independent testing laboratory. The calibration of the meters will be done once in five year as per CEA notification. The accuracy class of meters, feeder arrangements, metering and determination of net electricity supplied to grid and calibration interval are under purview of state electricity board and PP do not have any control on it.
QA/QC procedures	Calibration records will be maintained at the O&M site office.
Purpose of data	Calculation of baseline emissions
Additional comment	The data will be archived for crediting period+2 years

B.7.2. Sampling plan

Sampling is not required for the given project activity.

B.7.3. Other elements of monitoring plan

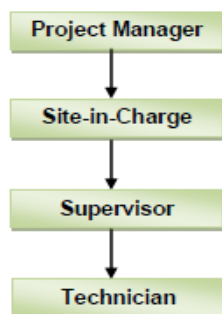
Project participants has implemented 31.2 MW Wind energy power generation project. The monitoring plan for the project activity will be formulated according to specifications given in the approved consolidated methodology ACM0002 version 20. The project proponent has devised a monitoring plan to ensure proper and continuous monitoring of the parameters involved in actual emission reduction calculations.

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Since the methodology is based on ex ante determination of the baseline emissions, the monitoring of the grid emission factor is not required. Thus, the sole parameter for monitoring for the project activity is the electricity supplied to the grid. The project proponent has entered into comprehensive Operation & Maintenance contract with Wind World (India) Limited, the supplier of Wind Electric Generators. The activities of the O&M team comprising of Wind World (India) Ltd. will be supervised by the Project Manager of KWEPL. The following will be maintained during operation of the project activities.

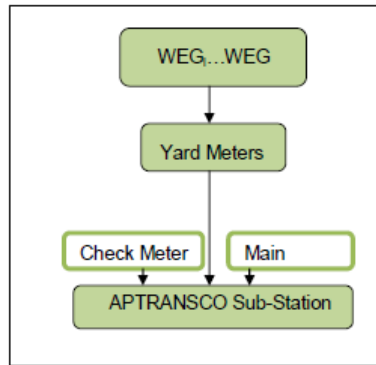
- i. Monitoring the functioning of the metering arrangements and getting them calibrated by an accredited agency as per the State Electricity Board norms, so that the accuracy and reliability levels are maintained.
- ii. Periodic onsite inspections to ensure the quality of the data collected by the team and initiate steps in case of any abnormal conditions.
- iii. Ensure monthly recording of the generation particulars.
- iv. Obtaining and archiving the generation certificates from the State Electricity Board for aggregation at the required intervals.
- v. Verification and reconciliation, if needed, of the generation certificates with the generation data recorded and maintained regularly.
- vi. Aggregating the data on net exported energy from the project thus reconciled and submission to KWEPL. This will then be forwarded to the CDM advisor for calculation and reporting of ERs.

Organisational Structure:



Metering system and monitoring plan:

- The project activity has a bulk meter comprising of a main meter, a check meter and a stand- by meter installed at the Wind World's sub- station. All the meters are bidirectional with accuracy class of 0.2s.
- The wind mills are grouped into clusters and have a dedicated bulk meter for each cluster.
- The initial readings (electricity supplied by the WTGs to the pooling sub- station) are taken at the bulk meter and also readings at the individual WEGs are taken by the Wind World operator on site.
- A Joint Meter Reading are taken by the representatives of Wind World and APTRANSCO at the high voltage side of the step up transformer installed at the substation at a particular date. This final reading is reported in the JMR issued by the APTRANSCO to Wind World.
- In case the main metering system is not in service, then the check metering system shall be used until the main system is back to service.
- Meter reading would be jointly signed by both the representatives.
- The main and the check metering systems shall be sealed in presence of representatives of Power producers, Wind World, and APTRANSCO.
- When any of these metering systems is found to be outside acceptable limits of accuracy or otherwise not functioning properly, it shall be repaired, recalibrated or replaced.
- PP will raise a monthly energy bill/statement based after calculating the losses incurred while transmitting power using the individual WEG values recorded at the site by Wind World officials and the windfarm electricity generation values mentioned in JMR on a monthly basis and the payment by State Electricity Board is done on this basis. The billing and payment records will be maintained by the PP.
- Calibration and Testing of Meters will be done by the accredited agency as per norms. The usual practice involves annual calibration of all the meters.



Metering Arrangement

Calculation of data:

Monthly invoice shall be determined as follows:

$$DE = X1 - (X1 \times Z\%)$$

Where,

- DE Delivered Energy pertaining to the project activity
- X1 Reading of the energy meter installed at the project's switchyard
- Z Transmission loss (%) incurred in the transmission line between the project & substation

$$Z = \left\{ \frac{(X1+X2+X3+...Xn)-Y}{(X1+X2+X3+...Xn)} \right\} \times 100$$

Where:

- Y Reading of the common energy meter installed on the 220KV side of the pooling substation
- X1,X2,...Xn are the readings of the energy meters installed at the various individual wind power projects being developed/proposed to be set up in the area and connected to the pooling substation

QA and QC Procedures

The electricity meter with accuracy class 0.2s at substation end (i.e. one main and one check meter and a stand-by meter) are installed. Calibration certificates of meters will be kept in records in seriatim.

Data Storage and Archiving

All the data items monitored under the monitoring plan will be kept for 2 years after the end of crediting period or till the last issuance of CERs for this project activity, whichever occurs later. The data will be archived both electronically and manually, and kept in safe storage by KWEPL.

SECTION C. Duration and crediting period

C.1. Duration of project

C.1.1. Start date of project

23/08/2012 [Date on which first purchase order was issued to the equipment supplier Wind World (India) Ltd. (formerly known as Enercon (India) Limited) for WEGs to be installed at the site]

C.1.2. Expected operational lifetime of project

20 years

C.2. Crediting period of project

C.2.1. Start date of crediting period

01/08/2018, or two years prior to the date of Project Design Certification, whichever is later.

C.2.2. Total length of crediting period

5 years ⁷ (fixed till 27/10/2024)

SECTION D. Safeguarding principles assessment

D.1. Analysis of social, economic and environmental impacts

Safeguarding principles	Assessment questions	Assessment of relevance to the project (Yes/potentially/no)	Justification	Mitigation measure (if required)
SOCIAL & ECONOMIC SAFEGUARDING PRINCIPLES				
1. Human Rights	<p>a. The Project Proponent and the Project shall respect Internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights.</p> <p>b. The Project shall not discriminate with regards to participation and inclusion.</p>	No	<p>a. The Project is not in conflict with the economic livelihood or other issue of the local community. Thus, the Project does not cause any human rights abuse and respects internationally proclaimed human rights issue.</p> <p>b. Project activities are not expected to cause any human rights abuse. As a member of United Nations⁸ and part of UN Agreement on Human Rights⁹, it is ensured by law in India that no action can be taken against human rights.</p>	Not Required
2. Gender Equality & Women's Rights	<p>1. The Project shall complete the following gender assessment questions in order to inform Requirements, below:</p> <p>a. Is there a possibility that the Project might reduce or put at risk women's access to or control of resources, entitlements and benefits?</p> <p>b. Is there a possibility that the Project can adversely affect men and women in marginalised or vulnerable communities (e.g., potential increased burden on women or social isolation of men)?</p> <p>c. Is there a possibility that the Project might not take into</p>		<p>1. The project does not decrease women's access to or control of resources.</p> <p>a) No, the Project does not reduce women's access to or control of resources, entitlements and benefits. The project will benefit to local community regardless of gender.</p> <p>b) No, the Project does not create any adverse effect on the local community.</p> <p>c) No, the Project does not consider the gender roles while engaging</p>	Not Required

⁷ The crediting period of the registered CDM PDD is till 27 Oct 2024.

⁸ <https://labour.gov.in/landilasdivision/india-ilo>

⁹ <https://www.ilo.org/newdelhi/lang--en/index.htm>

<p>account gender roles and the abilities of women or men to participate in the decisions/designs of the project's activities (such as lack of time, child care duties, low literacy or educational levels, or societal discrimination)?</p> <p>d. Does the Project take into account gender roles and the abilities of women or men to benefit from the Project's activities (e.g., Does the project criteria ensure that it includes minority groups or landless peoples)?</p> <p>e. Does the Project design contribute to an increase in women's workload that adds to their care responsibilities or that prevents them from engaging in other activities?</p> <p>f. Would the Project potentially reproduce or further deepen discrimination against women based on gender, for instance, regarding their full participation in design and implementation or access to opportunities and benefits?</p> <p>g. Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and priorities of women and men in accessing and managing environmental goods and services?</p> <p>h. Is there a likelihood that the proposed Project would expose women and girls to further risks or hazards?</p> <p>2. The Project shall not directly or indirectly lead to/contribute to adverse</p>		<p>them and thereby provide equal rights to men and women ¹⁰. Local community meetings are scheduled considering participation by both Men and Women.</p> <p>d) The project does not discriminate the local community on basis of gender or caste or religion and therefore equally serve to all.¹¹</p> <p>e) No, the Project design neither increase women's workload nor prevent them from engaging in other activities.</p> <p>f) There is no room for discrimination against women in this Project.</p> <p>g) The Project will not limit women's ability regarding natural resources. The project is solely utilizing Wind power and therefore does not impact natural resources of the region.</p> <p>h) No, the Project will not expose women and girls to further risks or hazards.</p> <p>2. The project does not create any</p>	
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¹⁰ <https://labour.gov.in/sites/default/files/Equal%20Remuneration%20Rules.%201976.pdf>

¹¹ https://labour.gov.in/sites/default/files/equal_remuneration_act_1976.pdf

	<p>impacts on gender equality and/or the situation of women.</p> <p>a. Sexual harassment and/or any forms of violence against women - address the multiple risks of gender-based violence, including sexual exploitation or human trafficking.</p> <p>b. Slavery, imprisonment, physical and mental drudgery, punishment or coercion of women and girls.</p> <p>c. Restriction of women's rights or access to resources (natural or economic).</p> <p>d. Recognise women's ownership rights regardless of marital status - adopt project measures where possible to support to women's access to inherit and own land, homes, and other assets or natural resources.</p> <p>3. Projects shall apply the principles of non-discrimination, equal treatment, and equal pay for equal work, specifically:</p> <p>a. Where appropriate for the implementation of a Project, paid, volunteer work or community contributions will be organised to provide the conditions for equitable participation of men and women in the identified tasks/activities.</p> <p>b. Introduce conditions that ensure the participation of women or men in Project activities and benefits based on pregnancy, maternity/paternity leave, or marital status.</p> <p>c. Ensure that these conditions do not limit the access of women or men, as the case may be, to Project</p>		<p>direct or indirect impacts on gender equality and/or the situation of women:</p> <p>a. The project proponent has a grievance cell which would investigate complaints.</p> <p>b. Project participation by women or girls is merely voluntary basis and there is no compulsion on them. The project proponent has a grievance cell which would investigate complaints.</p> <p>c. The Project will not restrict women's rights or access regarding natural resources.</p> <p>d. Marital status is completely irrelevant to the Project. The project proponent does not discriminate on gender, caste, religion etc.</p> <p>3. The project has applied the principles of non-discrimination and equal treatment, pay & work as follows:</p> <p>a. Yes, the Project has equal opportunity for women and men to contribute both in volunteer and working positions.</p> <p>b. The project proponent has a specified HR policy that considers participation by both men and women.</p> <p>c. There is no limit on the access to Project participation and benefits</p>	
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	<p>participation and benefits.</p> <p>4. The Project shall refer to the country's national gender strategy or equivalent national commitment to aid in assessing gender risks.</p>		<p>from either of these conditions.</p> <p>4. PP does not involve in any form of discrimination in any kind. India also ratified relevant ILO core conventions on equality, namely Equal Remuneration Convention (Convention No 100) and Discrimination (Employment and Occupation) Convention (Convention No 111) in 1997¹².</p>	
3. Community Health, Safety & Working Conditions	<p>a. The Project shall avoid community exposure to increased health risks and shall not adversely affect the health of the workers and the community.</p>	No	<p>a. The project proponent is committed to the employee's workplace health & safety during all phases of the project. All employees will attend health & safety trainings. This is issued in the Labour code on Occupational Safety, Health and Working Conditions and UN Agreement on Human Rights¹³.</p>	Workplace Health & Safety trainings will be conducted regularly during the project operation.
4. Cultural Heritage, Indigenous Peoples, Displacement and Resettlement	<p>a. Does the Project Area include sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g., knowledge, innovations, or practices)?</p> <p>b. Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)?</p> <p>c. Does the Project require any change to land tenure arrangements and/or other rights?</p> <p>d. For Projects involving land-use tenure, are there any uncertainties with regards land tenure, access rights, usage rights or land ownership?</p>		<p>a. This is a Large -Scale CDM Project under validation Wind power project, there are no protected archeological and cultural heritage sites are reported within the project footprint". Law on Cultural heritage is protected against alteration, damage or removal by the "law on cultural heritage¹⁴".</p> <p>b. The project does not involve any settlement areas. Thus, this project does not cause the physical or economic relocation of peoples. The project activity does not involve any alteration of existing roads as well as it does not add additional traffic. Since the site located isolated area, the traffic volume is negligible. Hence, there is no additional burden to the existing traffic. In addition, the project proponent built new roads for those sites which do not have road access.</p> <p>c. The WTGs were and all of them belongs to PP as per Commissioning</p>	Not required

¹² https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---sro-new_delhi/documents/publication/wcms_650119.pdf

¹³ <https://www.ohchr.org/EN/Countries/AsiaRegion/Pages/INIndex.aspx>

¹⁴ <https://cpwd.gov.in/Publication/ConservationHertBuildings.pdf>

	e. Are indigenous peoples present in or within the area of influence of the Project and/or is the Project located on land/territory claimed by indigenous peoples?		<p>report. No forest land is used for the project.</p> <p>d. There are no uncertainties regarding land tenure, access rights, usage rights or land ownership. The Land for the project has been approved by the several local Authorities.</p> <p>e. No cultural heritage/ indigenous people are replaced by the project.</p>	
1. Corruption	a. The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects.	No	PP does not involve and is not complicit in any kind of corruption. India has ratified UN convention against Corruption in 2011 ¹⁵ .	Not required
2. Economic Impacts	<p>a. The project does not employ and is not complicit in any form of child labor.</p> <p>b. The project provides workers with a safe and healthy work environment and is not complicit in exposing workers to unsafe or unhealthy work environments.</p> <p>c. The project does not involve and is not complicit in any form of forced or compulsory labor.</p>	No	<p>a. PP and their subcontractors complying with all relevant national laws regarding child labor. PP will not employ children in any shape or form for their works. India has ratified ILO “C138 – Minimum Age Conventions” and “C182 – Worst Forms of Child Labour Convention”¹⁶.</p> <p>b. The project owner is committed to the safe and healthy working conditions all phases of the project. All employees will attend trainings health & safety. This issue is protected by Labor code¹⁷ and UN Agreement on Human Rights¹⁸.</p> <p>c. PP and appointed contractors will not involve in any form of forced or compulsory labour. India has ratified ILO “C029 – Forced Labour Convention”¹⁹</p>	Not Required
ENVIRONMENTAL & ECOLOGICAL SAFEGUARDING PRINCIPLES				
1. Climate and Energy	<p>a. Will the Project increase greenhouse gas emissions over the Baseline Scenario?</p> <p>b. Will the Project use energy from a local grid or</p>	No	<p>a. The project reduces Greenhouse Gas (GHG) emissions and fossil fuel usage compared to the baseline scenario.</p> <p>b. On the contrary the project generates renewable energy and</p>	Not required

¹⁵ https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg_no=XVIII-14&chapter=18&clang=en#EndDec

¹⁶ https://www.ilo.org/dyn/normlex/en/f?p=1000:11200:0::NO:11200:P11200_COUNTRY_ID:102691

¹⁷ <https://www.ohchr.org/EN/Countries/AsiaRegion/Pages/INIndex.aspx>

¹⁸ <https://www.ohchr.org/EN/Countries/AsiaRegion/Pages/INIndex.aspx>

¹⁹ https://www.ilo.org/dyn/normlex/en/f?p=1000:11200:0::NO:11200:P11200_COUNTRY_ID:102691

	power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users?		supplies electricity to the grid. The auxiliary consumption is measured by deduction of power supplied to the grid from the total power generated by the plant. However, it's to be noted that the auxiliary power consumed by the plant is generated as renewable energy and thereby no emission involved. Hence, it's not required to be monitored.	
2. Water	<p>a. Will the Project affect the natural or pre-existing pattern of watercourses, ground-water and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?</p> <p>b. Could the Project directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of erosion? If 'Yes' or 'Potentially' proceed to question 2.</p> <p>c. Is the Project's area of influence susceptible to excessive erosion and/or water body instability?</p>	No	<p>a. The project being a Large-scale Wind power project thus there is no impact of water resources. The plant area does not have large rivers and streams flow. In the dry season, there is almost no water, only water in the rainy season.</p> <p>b. No. This is unlikely by the project.</p> <p>c. No. the risk of erosion is unlikely by the project.</p>	Not required
3. Environment, Ecology and Land Use	<p>a. Does the Project involve the use of land and soil for production of crops or other products?</p> <p>b. Will the Project be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions?</p> <p>c. Could the Project be negatively impacted by the use of genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development)?</p> <p>d. Could the Project</p>		<p>a. The project has been established on the land which was not used for production of crops and other products for a long time.</p> <p>b. The project is susceptible to decreased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme conditions.</p> <p>c. The large-scale wind plant does not affect the herbal life.</p> <p>d. The project takes a precautionary approach regarding environmental challenges and is not complicit in practices contrary to the precautionary principle. The environment is protected by several Laws and Regulations in India. The purpose of the "Law on</p>	Not Required

	<p>potentially result in the release of pollutants to the environment?</p> <p>e. Will the Project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials?</p> <p>f. Will the Project involve the application of pesticides and/or fertilisers?</p> <p>g. Will the Project involve the harvesting of forests?</p> <p>h. Does the Project modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives?</p> <p>i. Will the Project involve animal husbandry?</p> <p>j. Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites[11] identified?</p> <p>k. Are there any endangered species identified as potentially being present within the Project boundary (including those that may route through the area)?</p> <p>l. Does the Project potentially impact other areas where endangered species may be present through transboundary affects?</p>		<p>Environmental Protection” is to protect the environment with principles of sustainable development and environment ²⁰ . The project owner also follows necessary procedures for environmental safety at the project.</p> <p>e. All hazardous and non-hazardous wastes will be disposed as per the local regulations. The wind power project does not involve eission of Hazardous waste.</p> <p>f. Not applicable for Wind power plants.</p> <p>g. No. the project area was barren land before the project implementation.</p> <p>h. No. The project does not modify the quantity or nutritional quality of food available.</p> <p>i. No. Not applicable for Wind project.</p> <p>j. This is a large-scale wind power project which is located on barren land therefore does not alter biodiversity and High conservation value areas, and there are no rare and valuable plant and animal species.</p> <p>k. No. There were no endangered species found in the project boundary, project has got the approval from ministry of environment and forest in the for of HCA.</p> <p>l. No. The project does not impact other areas where endangered species may be present.</p>	
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²⁰ file:///C:/Users/hp/Downloads/The-Environment-Protection-Act-1986.pdf

SECTION E. Local stakeholder consultation

E.1. Solicitation of comments from stakeholders

This is a registered CDM project activity (UN Reference No: 10400). PP had conducted the Stakeholder consultation physical meeting in line with the CDM requirements and guidelines.

Details of the CDM Stakeholder consultation meeting is provided below:

The comments from local stakeholders were invited through a local stakeholder meeting conducted at Wind World India Limited, Near MG Metallic Spring Factory, Back side of Apollo Tyres, Bellary Road, Anantpur, Andhra Pradesh – 515001 on 10/05/2013. A public notice was published in the local daily named „Enadu“ dated 30/04/2013 inviting all interested employees, community members, wind turbine suppliers, environment regulators, NGOs and local citizens for the stakeholder consultation meeting. The meeting was attended by the following stakeholders:

- Representatives from KWEPL
- Representatives from Wind World India Limited
- Representatives from IL&FS Environmental and Infrastructure Services Limited
- Local villagers.



Stakeholder Meeting in Progress

The stakeholders were introduced to the project activity by a representative from the Wind World India Limited. The representatives from KWEPL gave detailed information to the stakeholders about the wind power project. A description of how electricity is generated from wind power was explained. The role of the project activity in mitigating the GHG emissions and benefits to the people in terms of improvement in pollution levels were also highlighted.

PP has kept a complaint box and complaint /feedback register at project site to take continuous feedback from the stakeholders.

Apart from this, a Local Stakeholder Feedback round will be carried out inline with the requirements of Gold Standard process. The SFR round is planned after preliminary review and the website for comments will be open for 60 days after SFR.

E.2. Summary of comments received

The stakeholders shared their views on the project activity. Most of the villagers showed positive response. They were hopeful that the proposed project activity will help in the development of the local community, generate more employment and solve the electricity problem without harming their natural surroundings. Following queries were raised by the local community:

- Will the local people get employment from the project activity?

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- Will there be any effect on the cattle grazing near the project area from the commencement of the project?
- Will the machines installed create sound and disturb the surrounding?

The meeting was very cordial and ended on a positive note. The stakeholders were very appreciative of the benefits coming to the community from the CDM project activity. Thus, no adverse comments were received regarding the project activity and all the queries raised were satisfactorily addressed. Overall, the development of infrastructure in the locality was appreciated.

The Stakeholder Feedback Round and all the documents would be made available to public through website for a minimum of 2 months before Validation is finalized to allow time for stakeholders to review and comment. The stakeholders shall be intimated for the SFR round, along with the invitations they shall be provided with a public link where all the project related documents shall be available for 60 day period. They are free to comment either online or during the actual SFR meeting.

Once the 60 day period is completed only then the validation shall be finalized.

E.3. Report on consideration of comments received

The following responses were provided in relation to the comments received (as mentioned in section E.2) from the local stakeholders:

- There will be job opportunities for the people living in vicinity of the project area.
- There will be no effect on the cattle grazing near the project as there is no relation between the project and cattle grazing.
- Many companies have installed wind projects in several villages and no such problem has been faced. The sound from the machines is negligible and carries no significant effect or is of major concern.

At the end of the consultation, the stakeholders were convinced that the project activity would not adversely impact their environment or livelihood. Moreover, the project would provide employment opportunities to the local people as construction workers, watchmen, security guards and drivers on site. The project proponents were commended for their action towards environment protection. Apart from the above comments and questions, no major issues were raised that could be related to the environmental or CDM aspect of the project. All comments and questions were duly taken into account by the project developer and addressed satisfactorily.

Appendix 1. Contact information of project participants

Organization name	Khandke Wind Energy Private Limited
Registration number with relevant authority	U40105MH2010PTC209923
Street/P.O. Box	8th Floor, Plot C- 22, G Block, Bandra Kurla Complex
Building	IL&FS Financial Centre
City	Mumbai
State/Region	Maharashtra
Postcode	400051
Country	India
Telephone	+91-22-43033065
Fax	-
E-mail	rohil.kudtarkar@ilfsindia.com
Website	http://www.ilfsindia.com/
Contact person	Mr. Rohil Kudtarkar
Title	-
Salutation	Mr.
Last name	Kudtarkar
Middle name	-
First name	Rohil
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Mobile	+91-22-43033065
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Revision History

Version	Date	Remarks
1.1	24 August 2017	Updated to include section A.8 on 'gender sensitive' requirements
1	10 July 2017	Initial adoption