PROJECT CONCEPT NOTE
CARBON OFFSET UNIT (CoU) PROJECT

Title: Enercon Wind Farms in Karnataka Bundled Project
Version 1.0
Date 06/03/2025
First CoU Issuance Period: 4 years 5 months 30 days
Date: 01/07/2020 to 31/12/2024

Project Concept Note (PCN)
CARBON OFFSET UNIT (CoU) PROJECT

BASIC INFORMATION	
Title of the project activity	Enercon Wind Farms in Karnataka Bundled Project
The scale of the project activity	Large-Scale Wind Project
Completion date of the PCN	06/03/2025
Project participants	WIND WORLD WIND FARMS(Krishna) PVT LTD, WIND WORLD WIND FARMS(Karnataka) PVT LTD
Host Party	INDIA
Applied methodologies and standardized baselines	ACM0002-Consolidated baseline methodology for grid-connected electricity generation from renewable sources -Version 22.0
Sectoral scopes	01 Energy industries (Renewable/Non-renewable Sources)
Estimated amount of total GHG emission reductions	**27,260** CoUs (Annually)

SECTION A. Description of project activity

A.1. Purpose and general description of Carbon offset Unit (CoU) project activity >>

The project activity "Enercon Wind Farms in Karnataka Bundled Project" is located in the Gadang district in the State of Karnataka, India. The project activity is a bundled project with a total capacity of 18.2 MW owned by Wind World Wind Farms (Karnataka) Pvt Ltd (3.2MW) & Wind World Wind Farms (Krishna) Pvt Ltd (15MW) wind power projects. The objective is development, design, engineering, procurement, finance, construction, operation and maintenance of supply, erection, commissioning and operation of 29 machines of rated capacity 800 kW (Karnataka) & 600kW (Krishna) each. The machines are Enercon E-40 & E-48 make. The project is owned by Wind World Wind Farms PVT LTD (hereinafter referred to as the Project Proponent or PP).

Purpose of the project activity:

The purpose of the project activity is to generate emission free and environment friendly electricity from the wind energy potential available in the region. The project is expected to generate and supply **33,481 MWh** of electricity annually to the Indian grid. The project thus addresses the demand–supply gap in the state of Karnataka and will assist the sustainable growth, conservation of resources and reduction of greenhouse gas emissions by using renewable energy source like wind energy. The project activity will contribute towards reduction of greenhouse gas (GHG) emission from the atmosphere, which has been estimated to be approximately **27,260 tCO2e** per year, by displacing an equivalent amount of electricity generation through the operation of existing fuel mix in the grid comprising mainly of fossil fuel-based power plants. Thus, the project does not only reduce the demand-supply gap of the respective grid, but also helps in reducing other pollutants like SOx, NOx, etc. from the atmosphere. In the absence of the project activity the equivalent amount of electricity would have been generated from the connected/ new power plants in the Indian grid, which are/ will be predominantly based on fossil fuels.

Wind World (India) Limited ("Wind World") is the equipment supplier and the operations and maintenance contractor for the Project. There are 29 Wind Energy Convertors ("WEC's") with rated capacity 800 kW & 600kW each. The generated electricity is supplied to the Electricity Distribution Company (DISCOM) under a long-term power purchase agreement (PPA). The expected operational lifetime of the project is 25 years. The project, being a renewable energy generation activity, leads to reduction in fossil fuel dominated electricity generation from the Indian grid.

This is also the pre-project scenario. The technology employed for the project is well proven and safe.
Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods,

etc.):

The WECs under the project activity were commissioned between 15/03/2005 and 26/03/2005.

S. No.	Name of Customer	Capacity (MW)	Site	Commissioning date
1	Wind World Wind Farms (Karnataka) Ltd	3.2	Gadag	26/03/2005
2	Wind World Wind Farms (Krishna) Ltd	15	Gadag	15/03/2005

A.2 Do no harm or Impact test of the project activity>>

There are social, environmental, economic and technological benefits which contribute to sustainable development.

Social benefits:

- The project activity will contribute to socio-economic development through improving the infrastructure for road network and other mode of communications in the remote part of the state during both the construction and operational period.
- The project activity will utilize renewable energy source for electricity generation instead of fossil fuel-based electricity generation which would have emitted gaseous, liquid and/or solid effluents/wastes. Thus, the project causes no negative impact on the surrounding environment and contributes to environmental well-being.
- The project activity will contribute towards reduction of the GHG emissions as well as emission of pollutants like SOx, Suspended Particulate Matters (SPMs) etc. by avoiding equivalent amount of power generation from fossil fuel-based power plants.

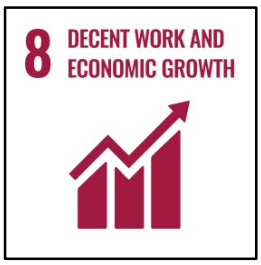
Environmental benefits:

- Utilizing wind energy instead of burning fossil fuels for electricity generation significantly decreases the emission of harmful pollutants, fostering cleaner air, water, and soil.
- Leveraging wind energy aids in preserving natural resources and minimizing detrimental impacts on the environment, contributing to overall ecological well-being.
- Moreover, harnessing wind energy offers a sustainable alternative to burning fossil fuels, which not only mitigates pollution but also conserves natural habitats and biodiversity, supporting healthier ecosystems and enhancing environmental resilience.

Economic benefits:

- The project will generate electricity utilizing renewable source like wind, thus will increase the contribution of renewable based power generation in the region and will also help in reducing the demand - supply gap of the respective grid.
- The project activity involves substantial amount of investment, thus will contribute towards generation of direct and indirect employment opportunities as per the requirement of the skilled and semi-skilled manpower.
- Use of a renewable source of energy reduces the dependence on imported fossil fuels and associated price variation, thereby leading to increased energy security.

Goal 7 	➢ The project activity will generate clean energy, which with increased share will increase the affordability at a cheaper rate to end user. The project activity will utilize energy (renewal resource) to generate power. The project activity will increase the share of renewable resource-based electricity to global mix of energy consumption

Goal 8 	➢ Decent work and economic growth. This project generates additional employment for skilled and unskilled people, also the project situated in remote area will provide employment opportunities to unskilled people from villages. The training on various aspects including safety, operational issues and developing a skill set will also be provided to employees ➢ This project will achieve full and productive employment and decent work.
Goal 13 	➢ This 18.2 MW Wind power project meets the SDG 13 goal by saving fossil fuel and producing clean energy. This project is expected to reduce 27,260 **tCO_2** annually. ➢ In a Greenfield project, electricity delivered to the grid by the project would have otherwise been generated by the operation of grid connected power plants. Thereby the project activity reduces the dependence on fossil fuel-based generation units and as there are no emissions associated with this project it contributes to the reduction of greenhouse gases (GHG) emissions.

A.3. Location of project activity >>

The project activity is located at Gadang District in the state of Karnataka.

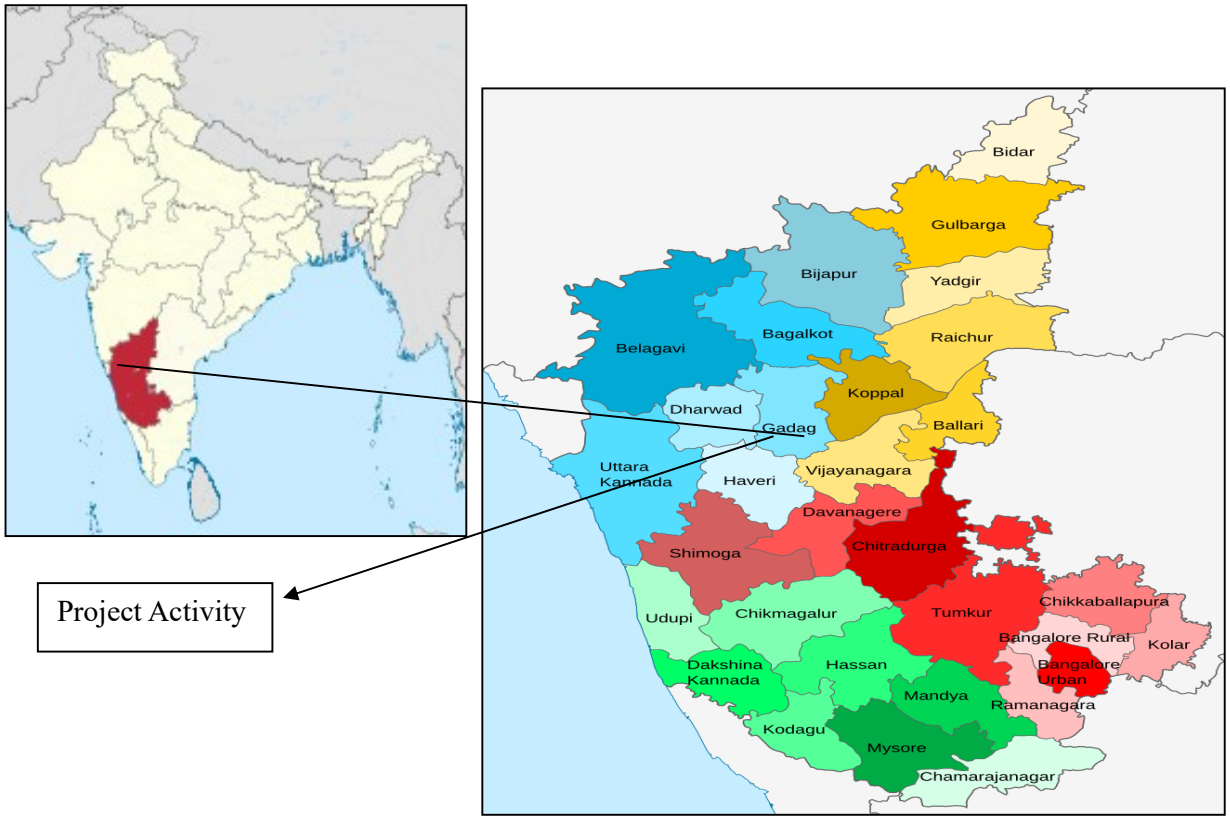
Details of Latitude & Longitude of Individual machines have been Given below: -

Sl No	Name of Customer	Individual Capacity (MW)	Site	R.R. NO.	Location No	Latitude			Longitude		
						Deg	Minutes	Second	Deg	Minutes	Second
1	Wind World Wind Farms (Krishna) Ltd	0.6	Gadag	EW KL H-6	1	75	44	15.11	15	11	48.10
2	Wind World Wind Farms (Krishna) Ltd	0.6	Gadag	EW KL H-6	2	75	44	17.51	15	11	44.22
3	Wind World Wind Farms (Krishna) Ltd	0.6	Gadag	EW KL H-6	3	75	44	18.61	15	11	41.19
4	Wind World Wind Farms (Krishna) Ltd	0.6	Gadag	EW KL H-6	4	75	44	18.89	15	11	37.80
5	Wind World Wind Farms (Krishna) Ltd	0.6	Gadag	EW KL H-6	5	75	44	16.41	15	11	35.01
6	Wind World Wind Farms (Krishna)Ltd	0.6	Gadag	EW KL H-6	6	75	43	31.81	15	12	48.51
7	Wind World Wind Farms (Krishna) Ltd	0.6	Gadag	EW KL H-6	7	75	43	50.49	15	12	41.81
8	Wind World Wind Farms (Krishna) Ltd	0.6	Gadag	EW KL H-6	8	75	43	52.29	15	12	38.71
9	Wind World Wind Farms (Krishna) Ltd	0.6	Gadag	EW KL H-6	9	75	43	55.60	15	12	35.29
10	Wind World Wind Farms (Krishna) Ltd	0.6	Gadag	EW KL H-6	10	75	44	23.26	15	13	17.08
11	Wind World Wind Farms (Krishna) Ltd			EW KL H-6							

		0.6	Gadag		11	75	44	2.08	15	12	29.80
12	Wind World Wind Farms (Krishna) Ltd	0.6	Gadag	EW KL H-6	12	75	44	10.74	15	11	52.99
13	Wind World Wind Farms (Krishna) Ltd	0.6	Gadag	EW KL H-6	13	75	44	11.63	15	11	50.29
14	Wind World Wind Farms (Krishna) Ltd	0.6	Gadag	EW KL H-6	14	75	44	23.69	15	13	14.09
15	Wind World Wind Farms (Krishna) Ltd	0.6	Gadag	EW KL H-6	15	75	44	23.30	15	13	9.40
16	Wind World Wind Farms (Krishna) Ltd	0.6	Gadag	EW KL H-6	16	75	44	21.78	15	13	6.22
17	Wind World Wind Farms (Krishna) Ltd	0.6	Gadag	EW KL H-6	17	75	44	20.10	15	13	3.59
18	Wind World Wind Farms (Krishna) Ltd	0.6	Gadag	EW KL H-6	18	75	44	19.52	15	13	0.10
19	Wind World Wind Farms (Krishna) Ltd	0.6	Gadag	EW KL H-6	19	75	44	18.39	15	12	54.90
20	Wind World Wind Farms (Krishna) Ltd	0.6	Gadag	EW KL H-6	20	75	44	19.29	15	12	52.10
21	Wind World Wind Farms (Krishna) Ltd	0.6	Gadag	EW KL H-6	21	75	44	18.00	15	12	49.11
22	Wind World Wind Farms (Krishna) Ltd	0.6	Gadag	EW KL H-6	22	75	44	20.00	15	12	45.39
23	Wind World Wind Farms (Krishna) Ltd	0.6	Gadag	EW KL H-6	23	75	44	20.39	15	12	42.01

24	Wind World Wind Farms (Krishna) Ltd	0.6	Gadag	EW KL H-6	24	75	44	4.59	15	12	27.41
25	Wind World Wind Farms (Krishna) Ltd	0.6	Gadag	EW KL H-6	25	75	44	3.61	15	12	24.29
26	Wind World Wind Farms (Karnataka) Ltd	0.8	Gadag	EW KL H-7	26	75	44	2.69	15	12	21.01
27	Wind World Wind Farms (Karnataka) Ltd	0.8	Gadag	EW KL H-7	27	75	43	57.98	15	12	16.99
28	Wind World Wind Farms (Karnataka) Ltd	0.8	Gadag	EW KL H-7	28	75	43	58.31	15	12	13.31
29	Wind World Wind Farms (Karnataka) Ltd	0.8	Gadang Gadag	EW KL H-7	29	75	44	1.71	15	12	10.30

The location of the project site has been shown below:



A.4. Technologies/measures >>

All the machines have been developed using state of the art technology. In wind energy generation, kinetic energy of wind is converted into mechanical energy and subsequently into electrical energy. Wind has considerable amount of kinetic energy when blowing at high speeds. This kinetic energy when passes through the blades of the WEG is converted into mechanical energy and rotates the wind blades. When the wind blades rotate, the connected generator also rotates, thereby producing electricity. The technology is a clean technology since there are no GHG emissions associated with the electricity generation.

The important parts of a windmill are:

Main Tower This is a very tall structure with a ladder at the bottom. The ladder is used for operation and maintenance.

Blades The WEGs are provided with three blades. The blades are self-supporting in nature made up of Fiber Reinforced Polyester. The blades are mounted on the hub.

Nacelle The Nacelle is the one which contains all the major parts of a WEG. The nacelle is made up of thick rugged steel and mounted on a heavy slewing ring. Under normal operating conditions, the nacelle would be facing the upstream wind direction.

Hub The Hub is an intermediate assembly between the wing and the main shaft of the wind turbine. Inside the hub, a system to actuate the aerodynamic brake is fitted. The hub is covered with nose cone.

Main Shaft The shaft is to connect the gear box and the hub. Solid high carbon steel bars or cylinders are used as main shaft. The shaft is supported by two bearings.

Gear Box,**Bearing and Housing** The gearbox is used to increase the speed ratio so that the rotor speed is increased to the rated generator speed. Oil cooling is employed to control the heating of the gearbox. Gearboxes are mounted over dampers to minimize vibration. The main bearings are placed inside housing.

Brake Brake is employed in the WEGs to stop the wind turbine mainly for maintenance check. Brakes are also applied during over speed conditions of the wind turbine. The brakes are placed on the high speed shaft.

Generator The generator uses induction type of generator. The generators are provided with monitoring sensors in each phase winding to prevent damage to the generators.

The project activity involves 29 numbers of wind energy converters (WECs) of Enercon make (800 kW, E48) & (600kW, E-40) with internal electrical lines connecting the Project with local evacuation facility. The WECs generates 3-phase power at 400V, which is stepped up to 33 KV. The Project can operate in the frequency range of 47.5–51.5 Hz and in the voltage range of 400 V ± 12.5%. The other salient features of the state -of-art-technology are:

• Gearless Construction - Rotor & Generator Mounted on same shaft eliminating the Gearbox. • Variable speed function – has the speed range of 18 to 33 RPM thereby ensuring optimum efficiency at all times.
• Variable Pitch functions ensuring maximum energy capture
• Near Unity Power Factor at all times
• Minimum drawl (less than 1% of kWh generated) of Reactive Power from the grid
• No voltage peaks at any time
• Operating range of the WEC with voltage fluctuation of -20 to +20%
• Less Wear & Tear since the system eliminates mechanical brake, which are not needed due to low speed generator which runs at maximum speed of 33 rpm and uses Air Brakes
• Three Independent Braking Systems
• Generator achieving rated output at only 33 rpm
• Incorporates lightning protection system, which includes blades
• Starts Generation of power at wind speed of 3 m/s

In the absence of the project activity the equivalent amount of electricity would have been generated from the connected/ new power plants in the Indian grid, which are/ will be

predominantly based on fossil fuels, hence baseline scenario of the project activity is the grid-based electricity system, which is also the pre-project scenario. Since the project activity involves power generation from wind, it does not involve any GHG emissions for generating electricity.

A.5. Parties and project participants >>

Party (Host)	Participants
India (Host)	1. Wind World Wind Farms(Krishna) Pvt Ltd, 2. Wind World Wind Farms(Karnataka) Pvt Ltd

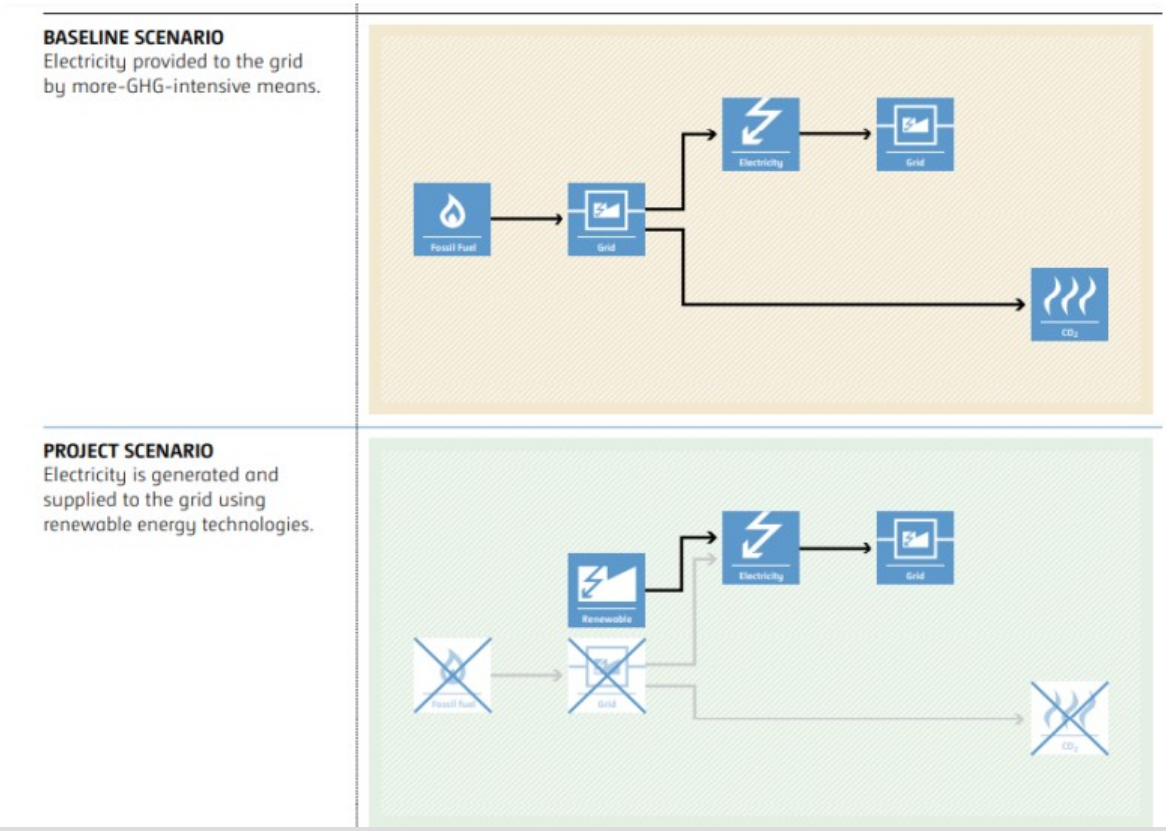
A.6. Baseline Emissions>>

The baseline scenario identified at the PCN stage of the project activity is:

The scenario existing prior to the implementation of the project activity, is electricity delivered to the facility by the project activity that would have otherwise been generated by the operation of grid connected power plants and by the addition of new generation sources. This is a green field project activity. There was no activity at the site of the project participant prior to the implementation of this project activity. Hence pre-project scenario and baseline scenario are the same.

As per the approved consolidated methodology ACM0002 Version 22, if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following: "If the project activity is the installation of a Greenfield power plant, the baseline scenario 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 to the grid".

The Schematic diagram showing the baseline scenario:



A.7. Debundling>>

The project activity is a debundled project of CDM with registration number 1286. The crediting period for this project under CDM was from 01/07/2010 to 30/06/2020 (Fixed), which has now ended. The project proponent (PP) seeks verification under UCR starting from 01/07/2020, meaning the crediting period for UCR begins from that date. Therefore, there is no double counting for this project.

SECTION B. Application of methodologies and standardized baselines

B.1. References to methodologies and standardized baselines >>

SECTORAL SCOPE –01 Energy industries (Renewable/Non-renewable sources)

TYPE **- Renewable Energy Projects**

CATEGORY- ACM0002., Consolidated baseline methodology for grid-connected electricity generation from renewable sources -Version 22.0

B.2. Applicability of methodologies and standardized baselines >>

Applicability Criteria.	**Applicability status**
1)This methodology is applicable to grid-connected renewable energy power generation project activities that: (a) Install a Greenfield power plant; (b) Involve a capacity addition to (an) existing plant(s); (c) Involve a retrofit of (an) existing operating plant(s)/unit(s); (d) Involve a rehabilitation of (an) existing plant(s)/unit(s), or (e) Involve a replacement of (an) existing plant(s)/unit(s). (f) Install a Greenfield power plant together with a grid-connected Greenfield pumped storage power plant. The greenfield power plant may be directly connected to the PSP or connected to the PSP through the grid.	The proposed project involves establishing a new grid-connected renewable wind power plant, confirming to the specified criteria.
2) In case the project activity involves the integration of a BESS, the methodology is applicable to grid-connected renewable energy power generation project activities that: (a)Integrate BESS with a Greenfield power plant; (b) Integrate a BESS together with implementing a capacity addition to (an) existing solar photovoltaic1 or wind power plant(s)/unit(s); (c) Integrate a BESS to (an) existing solar photovoltaic or wind power plant(s)/unit(s) without implementing any other changes to the existing plant(s); (d) Integrate a BESS together with implementing a retrofit of (an) existing solar photovoltaic or wind power plant(s)/unit(s). (e) Integrate a BESS together with a Greenfield power plant that is operating in coordination with a PSP. The BESS is located at site of the greenfield renewable power plant.	The project entails installing a new grid-connected renewable wind power project without the integration of a Battery Energy Storage System (BESS). Therefore, this condition does not apply to the project activity.
3)The methodology is applicable under the following conditions: (a) Hydro power plant/unit with or without reservoir, wind power plant/unit, geothermal power plant/unit, solar 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, solar, wave or tidal power	The proposed project involves installing new wind power plants without integrating a Battery Energy Storage System (BESS). Thus, the mentioned criterion does not apply

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; (c) In case of Greenfield project activities applicable under paragraph 7(a) above, the project participants shall demonstrate that the BESS was an integral part of the design of the renewable energy project activity (e.g., by referring to feasibility studies or investment decision documents); (d) The BESS should be charged with electricity generated from the associated renewable energy power plant(s). Only during exigencies2 may the BESS be charged with electricity from the grid or a fossil fuel electricity generator. In such cases, the corresponding GHG emissions shall be accounted for as project emissions following the requirements under section 5.4.4 below. The charging using the grid or using fossil fuel electricity generator should not amount to more than 2 per cent of the electricity generated by the project renewable energy plant during a monitoring period. During the time periods (e.g., week(s), months(s)) when the BESS consumes more than 2 per cent of the electricity for charging, the project participant shall not be entitled to issuance of the certified emission reductions for the concerned periods of the monitoring period. (e) In case the project activity involves PSP, the PSP shall utilize the electricity generated from the renewable energy power plant(s) that is operating in coordination with the PSP during pumping mode	
4)In case of hydro power plants, one of the following conditions shall apply: a)The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of reservoirs; or b)The project activity is implemented in an existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density calculated using equation (7) is greater than 4 W/m2; or c)The project activity results in new single or multiple reservoirs and the power density calculate equation (7), is greater than 4 W/m2. d)The project activity is an integrated hydro power project involving multiple reservoirs, where the power density of any of the reservoirs, calculated using equation (7), is lower than or equal to 4 W/m2, all of the following conditions shall apply. (i)The power density calculated using the total installed	The proposed project involves the installation of wind power plants/units. Hence, the mentioned criterion is not applicable.

capacity of the integrated project, as per equation (8), is greater than 4 W/m2; (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/m2 are: 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.	
5)In the case of integrated hydro power projects, project proponent shall: a)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 b)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 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 indifferent 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.	The proposed project activity involves the installation of wind power plants/units. Therefore, the mentioned criteria are not applicable.
6) In the case of PSP, the project participants shall demonstrate in the PDD that the project is not using water which would have been used to generate electricity in the baseline.	The proposed project activity involves installing wind power plants/units. Therefore, the specified criteria are not applicable.
7)The methodology is not applicable to: 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; b) Biomass-fired power plants;	The proposed project activity involves installing wind power plants/units. Therefore, the specified criteria are not applicable.
8)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	The proposed project activity involves installing wind power plants/units. Therefore, the specified criteria are not applicable.

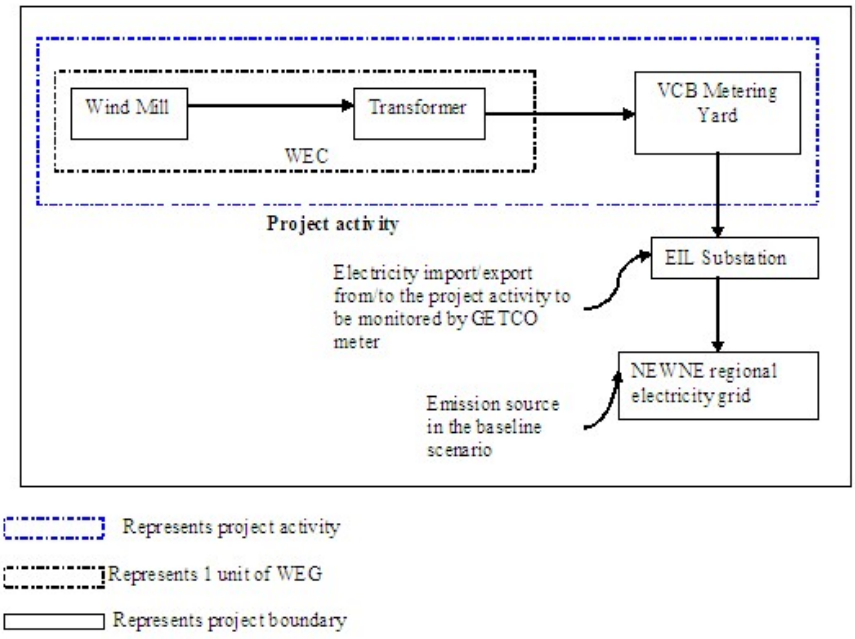
B.3. Applicability of double counting emission reductions >>

The project activity is a debundled project of CDM with registration number 1286. The crediting period for this project under CDM was from 01/07/2010 to 30/06/2020 (Fixed), which has now ended. The project proponent (PP) seeks verification under UCR starting from 01/07/2020, meaning the crediting period for UCR begins from that date. Therefore, there is no double counting for this project.

B.4. Project boundary, sources and greenhouse gases (GHGs)>>

According to the applicable methodology, the spatial extent of this project activity includes the project site and all the power plants connected physically to the electricity system (grid) that the power project is connected to. Therefore, the project boundary includes all the 29 WECs of VWIL along with the WECs of the other customers connected to the sub-station and the metering points. The project activity is further connected to the network of state transmission utility which Falls under the network of Indian grid. Thus, the project boundary also includes all the power plants physically connected to the Indian grid.

Project boundary:



The baseline study of the Indian grid shows that the main sources of GHG emissions under the baseline scenario are CO_2 emissions from the conventional power generating systems. Other emissions are that of CH_4 and N_2O but both emissions have been excluded for simplification. The project activity generates

Source		GHGs	Included?	Justification/Explanation
Baseline scenario	Grid connected electricity generation	CO_2	Yes	In the baseline scenario, the electricity would have been sourced from the Indian grid which in turn would be connected to fossil fuel fired power plants which emit CO_2.
		CH_4	No	No methane is expected to be emitted.
		N_2O	No	No nitrous oxide is expected to be emitted.
Project Scenario	Greenfield wind energy conversion system	CO_2	No	The project activity does not emit any emissions.
		CH_4	No	No methane is expected to be emitted.
		N_2O	No	No nitrous oxide is expected to be emitted.

B.5. Establishment and description of baseline scenario >>

As per the approved consolidated methodology ACM0002. version - 22, if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

"The baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise, been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid"

The project activity involves setting up of a new grid connected Wind power plant to harness the green power from wind energy. 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. The power produced at grid from the other conventional sources which are predominantly fossil fuel based. Hence, the baseline for the project activity is the equivalent amount of power produced at the Indian grid.

As per approved consolidated methodology ACM0002, version 22.0, emission reduction is estimated as difference between the baseline emission and project emission after factoring into leakage

Emission reductions are calculated as per methodology ACM0002, Version 22.0 Equation 17:

$$ER_y = BE_y - PE_y \qquad \textbf{(Eq. 1)}$$

Where,

ER_y = Emissions reductions in year y (t CO2)

BEy = Baseline emissions in year y (t CO2)
PEy = Project emissions in year y (t CO2)

Baseline Emissions

The baseline emissions as per methodology ACM0002, Version 22.0, para 57; encompass solely the CO2 emissions stemming from electricity generation in power plants displaced by the project activity. The methodology operates on the assumption that any electricity generation exceeding baseline levels would have originated from established grid-connected power plants and the integration of new grid-connected power plants.

The Baseline emissions as per methodology ACM0002, Version 22.0 Equation 17 in year y can be calculated as follows:

BE y = EG PJ, y * EF grid, CM, y

Where:

BE_y= Baseline emissions in year *y* (tCO_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)

$EF_{grid,y}$= Grid Emission factor in year y (tCO_2/MWh)

Since the project activity is the installation of a new grid connected renewable power plant (green field project), hence, $EG_{PJ,y}$ has been calculated as :

EGPJ,y = EGfacility,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)
EGfacility,y	= Quantity of net electricity generation supplied by the project plant/unit to the grid in year *y* (MWh/yr)

A "grid emission factor" denotes the CO2 emission factor (measured in tCO2/MWh) associated with each unit of electricity supplied by an electricity system. The UCR suggests employing an emission factor of 0.9[1] from 2013 to 2023 and Emission Factor of 0.757 tCO2/MWh for 2024.

Project Emission:
Regarding project emissions, ACM0002 version 22.0 specifies that only emissions related to fossil fuel combustion, emissions from the operation of geothermal power plants due to the release of non-condensable gases, and emissions from water reservoirs of hydroelectric plants should be taken

[1]As per UCR CoU Standard Update: 2024 Vintage UCR Indian Grid Emission Factor Announced | by Universal Carbon Registry | Jan, 2025 | Medium

into account. Since the project involves a wind power project, emissions from renewable energy plants are negligible
Hence (PEy = 0).

Leakage Emission:
Leakage, as outlined in ACM0002 version 22.0, para 5.6, is considered to be zero as there is no transfer of energy-generating equipment in the project activity
Hence (LEy = 0).

While the actual emission reduction achieved during the initial crediting period will be submitted during the first monitoring and verification, an ex-ante estimation is provided for reference.

Estimated Annual or Total baseline emission reductions (BEy)= 27,260 CoUs /year (27,260 tCO_{2eq}/year)

Year	Net Generation	Baseline Emissions	Project Emissions	Leakage	Emission Reductions	EF
	MWh	(tCO_2e)	(tCO_2e)	(tCO_2e)	(tCO_2e)	(tCO2/MWh)
Year 1	33480.72	30132.65	0.00	0.00	30132.65	0.9
Year 2	33480.72	30132.65	0.00	0.00	30132.65	0.9
Year 3	33480.72	30132.65	0.00	0.00	30132.65	0.9
Year 4	33480.72	30132.65	0.00	0.00	30132.65	0.9
Year 5	33480.72	25344.91	0.00	0.00	25344.91	0.757
Year 6	33480.72	25344.91	0.00	0.00	25344.91	0.757
Year 7	33480.72	25344.91	0.00	0.00	25344.91	0.757
Year 8	33480.72	25344.91	0.00	0.00	25344.91	0.757
Year 9	33480.72	25344.91	0.00	0.00	25344.91	0.757
Year 10	33480.72	25344.91	0.00	0.00	25344.91	0.757
Total Emission reduction	**334807**	**272600**	**0**	**0**	**272600**	
Average Emission Reduction	33481	27260	0	0	27,260	

B.6. Prior History>>
The project activity is registered under Clean Development Mechanism (CDM) project with registration number 1286. The crediting period of this project under CDM was 01/03/2020 – 30/06/2020.

B.7. Changes to start date of crediting period >>

There is no change in the start date of crediting period.

B.8. Permanent changes from PCN monitoring plan, applied methodology or applied

standardized baseline >>

There are no permanent changes from registered PCN monitoring plan and applied methodology

B.9. Monitoring period number and duration>>

First Issuance Period: 4 years 5 months 30 days– 01-07-2020 to 31/12/2024

B.8. Monitoring plan>>

Data and Parameters available at validation (ex-ante values):

Data/Parameter	EGy, net
Data unit	MWh
Description	"Form B" -Electricity Generated by Wind farm' prepared & issued by SLDC
Measurement methods and procedures	- All the cluster meters and sub-station meters (main & check meters) are electronic and two-way (bi-directional) meters that measure both export and import of electricity and provide net electricity exported to the grid. -All the cluster meters and sub-station meters (main & check meters) measure the electricity (export & Import) on continuous basis and are recorded by state utility on monthly basis. Data Type: Measured Monitoring equipment: Energy Meters are used for monitoring Archiving Policy: Electronic Calibration frequency: Once in 5 years [2](considered as per provision of CEA India). The net electricity generated by the project activity will be calculated meter_reg.pdf (cea.nic.in)
Value Applied	33481 Mwh
Monitoring frequency	Monthly
Purpose of data	For baseline emission calculations

[2]meter_reg.pdf (cea.nic.in)

Data / Parameter:	$EF_{Grid,y}$
Data unit:	tCO2 /MWh
Description:	A "grid emission factor" refers to a CO2 emission factor (tCO2/MWh) which will be associated with each unit of electricity provided by an electricity system. The UCR recommends an emission factor of 0.9 tCO2/MWh for the for the 2013 - 2020 years and 0.757 tCO2/MWh for year 2024.
Source of data:	UCR CoU Standard Update: 2024 Vintage UCR Indian Grid Emission Factor Announced | by Universal Carbon Registry | Jan, 2025 | Medium
Measurement procedures (if any):	-
Monitoring frequency:	Ex-ante fixed parameter
QA/QC procedures:	For the calculation of Emission Factor of the grid
Any comment:	

Appendix

>Meter details

Project Participants	Main Meter	Check Meter
Enercon Wind Farms (Karnataka) Ltd	6607750	5271064
Enercon Wind Farms (Krishna) Ltd	4259886	4259887