

PROJECT CONCEPT NOTE  
CARBON OFFSET UNIT (CoU) PROJECT



Tirunelveli, Tamil Nadu, India  
Unnamed Road, Tamil Nadu 627951, India  
Lat 8.941395°  
Long 77.614623°

**Title:** Vaayu India Wind Power Project in Tamilnadu

Version 1.0

Date 10/02/2025

First CoU Issuance Period: 3 years, 5 months, 30 days (inclusive of both the dates)

Date: 01/08/2021 to 31/12/2024



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

BASIC INFORMATION	
Title of the project activity	Vaayu India Wind Power Project in Tamilnadu
The scale of the project activity	Large-Scale Wind Project
Completion date of the PCN	10/02/2025
Project participants	VAAYU INDIA POWER CORPORATION 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	<b>87,689</b> CoUs (Annually)

## SECTION A. Description of project activity

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

The project “Vaayu India Wind Power Project in Tamilnadu” in Vagaikulam, Kuruchikulam, Ettankulam, Kalakudi, Muthammalpuram, Ukkirankottai villages in Tirunelveli district State of Tamilnadu. The project activity involves supply, erection, commissioning and operation of 63 machines of rated capacity 800 kW each. The machines are Enercon E-53 make. The project is owned by Vaayu India Power Corporation Pvt Ltd (hereinafter referred to as the Project Proponent or PP).

The details of the registered project are as follows:

#### **Purpose of the project activity:**

Vaayu (India) Power Corporation Private Limited (VIPCPL) has installed 50.4 MW wind farm in the state of Tamil Nadu in India. Wind World (India) Limited (“Wind World”) is the equipment supplier and the operations and maintenance contractor for the Project. There are 63 Wind Energy Convertors (“WEC’s”) of with rated capacity 800 KW each. The generated electricity is supplied to Electricity Distribution Company (DISCOM) under a long-term power purchase agreement (PPA). The expected operational lifetime of the project is for 20 years. The project being a renewable energy generation activity, leads to reduction in fossil fuel dominated electricity generation from the Indian grid.

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 **109625.44 MWh** of electricity annually to the Indian grid. The project thus addresses the demand–supply gap in the state of Tamil Nadu 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 **87,689 tCO<sub>2</sub>e** 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 SO<sub>x</sub>, NO<sub>x</sub>, 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.

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 first machine under the project activity was commissioned on 29<sup>th</sup> September 2010 and last machine under the project activity was commissioned on 11<sup>th</sup> July 2011.

## **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:**


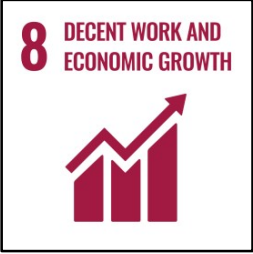

- The project activity will contribute to socio-economic development through improving the infrastructure for road network and other mode of communications in the remote part of the state during both the construction and operational period.
- The project activity will utilize renewable energy source 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 SO<sub>x</sub>, 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.

<p>Goal 7</p>  <p><b>7</b> AFFORDABLE AND CLEAN ENERGY</p>	<ul style="list-style-type: none"> <li>➤ 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</li> </ul>
<p>Goal 8</p>  <p><b>8</b> DECENT WORK AND ECONOMIC GROWTH</p>	<ul style="list-style-type: none"> <li>➤ 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</li> <li>➤ This project will achieve full and productive employment and decent work.</li> </ul>
<p>Goal 13</p>  <p><b>13</b> CLIMATE ACTION</p>	<ul style="list-style-type: none"> <li>➤ This 50.4MW Wind power project meets the SDG 13 goal by saving fossil fuel and produce clean energy. This project is expected to reduce 87,689 tCO<sub>2</sub> annually</li> <li>➤ 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.</li> </ul>

### A.3. Location of project activity >>

The project activity is located at Vagaikulam, Kuruchikulam, Ettankulam, Kalakudi, Muthammalpuram, Ukkirankottai villages in Tirunelveli district State of Tamilnadu. The project area extends between latitude 8O 52' 12.368" and 8O 56' 6.770" North and longitude 77O 35' 0.824" and 77O 37' 9.822" East. Tirunelveli railway station is about 25 kms away from the site. The latitude and longitude details along of each WEGs is provided given below:

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

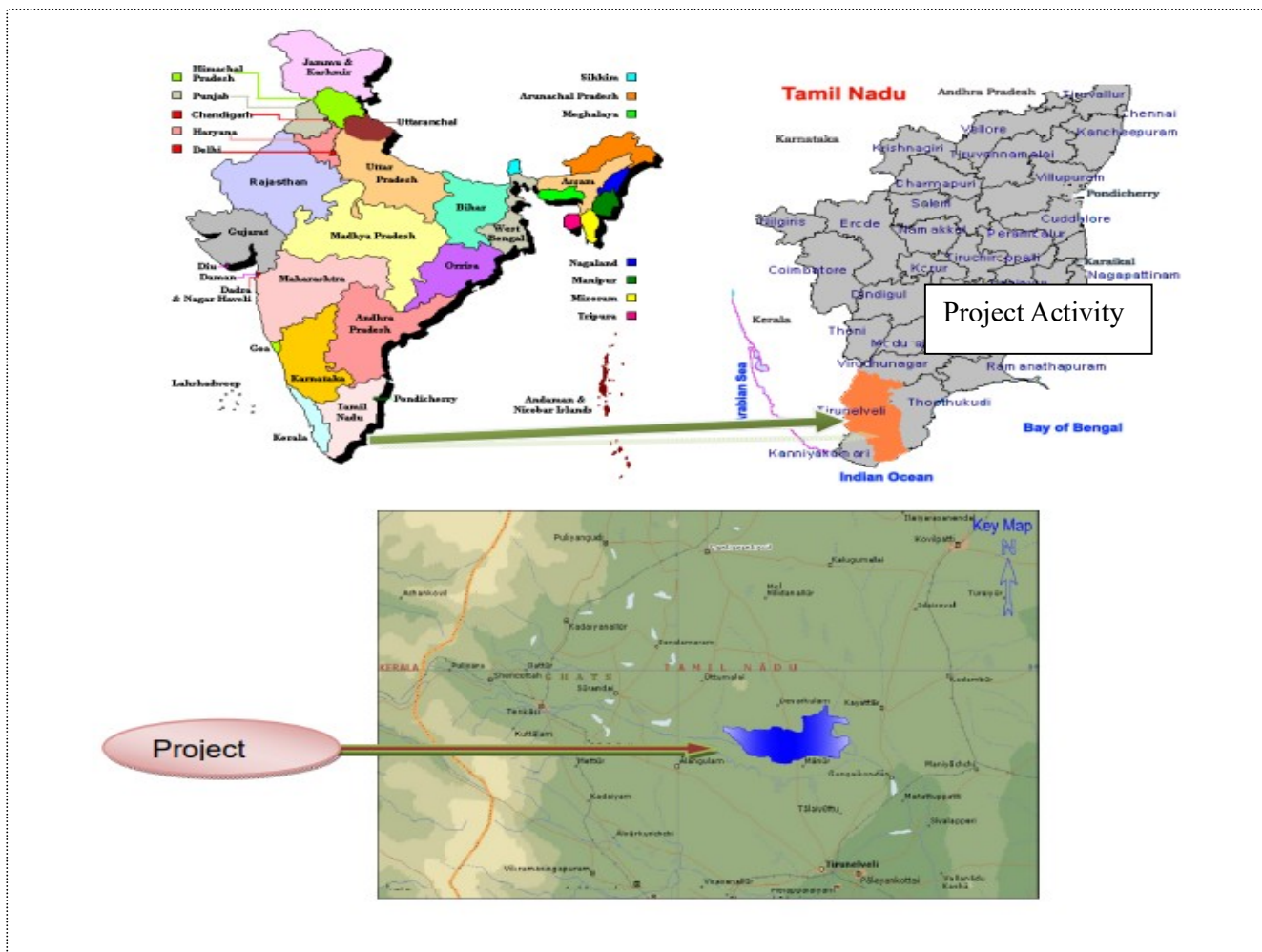
S No.	Location Number	Village	Latitude	Longitude
1	7	KURUCHIKULAM	8° 53' 26.985" N	77° 35' 43.461" E
2	8	KURUCHIKULAM	8° 53' 18.435" N	77° 35' 51.873" E
3	146	VAGAIKULAM	8° 55' 58.299" N	77° 37' 54.634" E
4	147	KALAKUDI	8° 56' 23.880" N	77° 37' 48.373" E
5	149	VAGAIKULAM	8° 55' 38.340" N	77° 37' 38.952" E
6	150	VAGAIKULAM	8° 55' 37.857" N	77° 37' 24.555" E
7	151	VAGAIKULAM	8° 55' 47.538" N	77° 37' 26.390" E
8	153	VAGAIKULAM	8° 55' 37.857" N	77° 37' 24.555" E
9	154	VAGAIKULAM	8° 56' 37.357" N	77° 37' 19.517" E
10	155	VAGAIKULAM	8° 56' 19.107" N	77° 37' 15.101" E
11	156	VAGAIKULAM	8° 55' 55.775" N	77° 37' 11.630" E
12	157	VAGAIKULAM	8° 55' 42.415" N	77° 37' 10.193" E
13	158	VAGAIKULAM	8° 55' 48.057" N	77° 36' 59.013" E
14	159	MUTHAMMALPURA M	8° 56' 33.966" N	77° 37' 6.832" E
15	160	MUTHAMMALPURA M	8° 56' 28.029" N	77° 36' 55.438" E
16	163	VAGAIKULAM	8° 56' 11.019" N	77° 36' 36.636" E
17	165	UKKIRANKOTTAI	8° 56' 12.215" N	77° 36' 19.240" E
18	167	KALAKUDI	8° 55' 8.373" N	77° 36' 58.664" E
19	179	VAGAIKULAM	8° 56' 45.130" N	77° 37' 33.509" E
20	180	VAGAIKULAM	8° 56' 6.770" N	77° 37' 11.676" E
21	181	VAGAIKULAM	8° 56' 3.605" N	77° 36' 54.544" E
22	V48	KURUCHIKULAM	8° 53' 6.300" N	77° 35' 0.824" E

S No.	Location Number	Village	Latitude	Longitude
23	V49	KURUCHIKULAM	8° 52' 57.577" N	77° 35' 10.805" E
24	V51	KURUCHIKULAM	8° 52' 40.412" N	77° 35' 9.180" E
25	V58	KURUCHIKULAM	8° 53' 30.146" N	77° 35' 9.922" E
26	V59	KURUCHIKULAM	8° 53' 22.443" N	77° 35' 13.695" E
27	V60	KURUCHIKULAM	8° 53' 10.091" N	77° 35' 16.977" E
28	V63	KURUCHIKULAM	8° 52' 34.838" N	77° 35' 29.519" E
29	V72	KURUCHIKULAM	8° 53' 12.156" N	77° 35' 33.445" E
30	V73	KURUCHIKULAM	8° 53' 2.788" N	77° 35' 33.248" E
31	V74	KURUCHIKULAM	8° 52' 53.993" N	77° 35' 34.953" E
32	V90	KALAKUDI	8° 52' 44.966" N	77° 36' 14.566" E
33	V94	KALAKUDI	8° 52' 22.001" N	77° 36' 14.274" E
34	V100	KALAKUDI	8° 52' 58.118" N	77° 36' 31.636" E
35	V101	KALAKUDI	8° 52' 48.402" N	77° 36' 30.161" E
36	V104	KALAKUDI	8° 52' 20.945" N	77° 36' 35.036" E
37	V105	KALAKUDI	8° 52' 12.502" N	77° 36' 32.883" E
38	V106	KALAKUDI	8° 52' 2.346" N	77° 36' 33.826" E
39	V107	KALAKUDI	8° 53' 21.734" N	77° 36' 59.574" E
40	V108	KALAKUDI	8° 53' 8.659" N	77° 36' 45.416" E
41	V109	KALAKUDI	8° 53' 0.568" N	77° 36' 44.148" E
42	V110	KALAKUDI	8° 52' 51.507" N	77° 36' 46.537" E
43	V114	ETTANKULAM	8° 52' 12.368" N	77° 36' 51.919" E
44	V116	KALAKUDI	8° 53' 12.200" N	77° 37' 22.992" E
45	V119	KALAKUDI	8° 53' 5.291" N	77° 37' 1.747" E
46	V120	KALAKUDI	8° 52' 54.106" N	77° 37' 5.527" E
47	V123	VAGAIKULAM	8° 54' 1.042" N	77° 37' 7.115" E
48	V125	KALAKUDI	8° 53' 20.931" N	77° 37' 25.769" E
49	V127	KALAKUDI	8° 53' 32.234" N	77° 37' 9.822" E
50	V129	KALAKUDI	8° 53' 21.809" N	77° 37' 11.906" E
51	V130	KALAKUDI	8° 53' 2.610" N	77° 37' 22.073" E
52	V132	KALAKUDI	8° 52' 47.738" N	77° 37' 22.916" E
53	V134	VAGAIKULAM	8° 54' 1.377" N	77° 37' 24.029" E



S No.	Location Number	Village	Latitude	Longitude
54	V137	KALAKUDI	8° 53' 52.241" N	77° 37' 23.375" E
55	V139	KALAKUDI	8° 53' 44.058" N	77° 37' 25.901" E
56	V141	KALAKUDI	8° 53' 30.641" N	77° 37' 23.385" E
57	V145	KALAKUDI	8° 53' 4.624" N	77° 37' 36.251" E
58	V147	KALAKUDI	8° 52' 56.356" N	77° 37' 32.431" E
59	V164	KALAKUDI	8° 53' 28.505" N	77° 36' 44.968" E
60	V165	KALAKUDI	8° 52' 32.752" N	77° 36' 25.961" E
61	V166	KALAKUDI	8° 53' 36.953" N	77° 36' 41.757" E
62	V167	KALAKUDI	8° 52' 30.367" N	77° 37' 13.700" E
63	W23	VAGAIKULAM	8° 55' 29.524" N	77° 37' 39.052" E

The location of the project site has been shown below:



#### A.4. Technologies/measures >>

The project activity involves 63 numbers of wind energy converters (WECs) of Enercon make (800 KW, E53) with internal electrical lines connecting the project activity with local evacuation facility. The WECs generate 3-phase power at 400V, which is stepped up to 33 KV. The project activity can operate in the frequency range of 48.5–51.5 Hz and in the voltage range of 400 V ± 12.5%. The average lifetime of the WEC is around 20 years as per the equipment supplier specifications. The other salient features of the state-of-art-technology are:

Turbine model	Enercon (E- 53)
Rated power	800 KW
Rotor diameter	52.9 m
Hub height	75 m (Concrete)
Turbine Type	Direct driven, horizontal axis wind turbine with variable rotor speed
Power regulation	Independent pitch system for each blade.
Cut in wind speed	2.5 m/s
Rated wind speed	12 m/s
Cutout Wind speed	28-34 m/s
Extreme Wind Speed	59.5 m/s
Rated rotational speed	29 rpm
Operating range rot. speed	12-29 rpm
Orientation	Upwind
No of Blades	3
Blade Material	Glass Fiber 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)

The project activity is new 50.4 MW wind power project, which consists of 63 machines of Enercon make E-53 type Wind Energy Converters (WECs) of 800 KW capacities each. 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)	VAAYU INDIA POWER CORPORATION PVT LTD

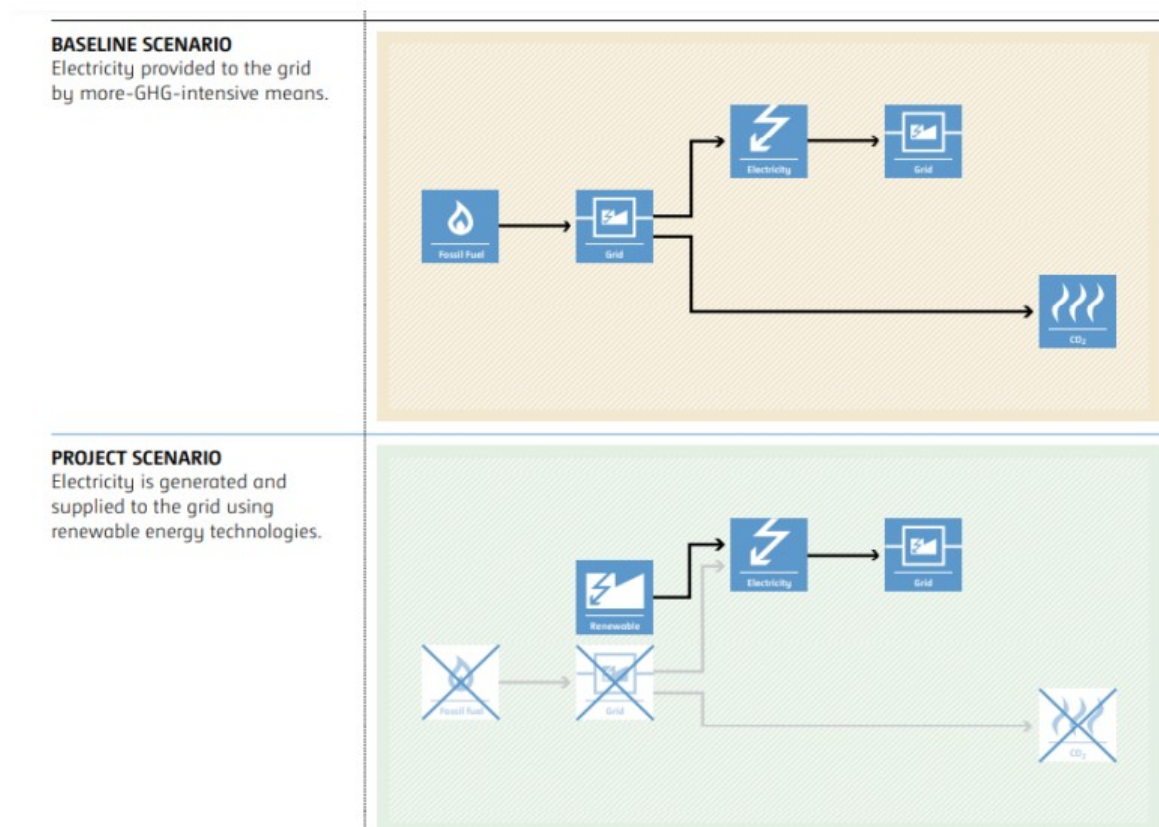
## A.6. Baseline Emissions>>

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>>

This Project is not a debundled component of a larger project activity.

## 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
<p>1) This methodology is applicable to grid-connected renewable energy power generation project activities that:</p> <ul style="list-style-type: none"> <li>(a) Install a Greenfield power plant;</li> <li>(b) Involve a capacity addition to (an) existing plant(s);</li> <li>(c) Involve a retrofit of (an) existing operating plant(s)/unit(s);</li> <li>(d) Involve a rehabilitation of (an) existing plant(s)/unit(s), or</li> <li>(e) Involve a replacement of (an) existing plant(s)/unit(s).</li> <li>(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.</li> </ul>	<p>The proposed project involves establishing a new grid-connected renewable wind power plant, confirming to the specified criteria.</p>
<p>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:</p> <ul style="list-style-type: none"> <li>(a) Integrate BESS with a Greenfield power plant;</li> <li>(b) Integrate a BESS together with implementing a capacity addition to (an) existing solar photovoltaic<sup>1</sup> or wind power plant(s)/unit(s);</li> <li>(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);</li> <li>(d) Integrate a BESS together with implementing a retrofit of (an) existing solar photovoltaic or wind power plant(s)/unit(s).</li> <li>(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.</li> </ul>	<p>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.</p>
<p>3) The methodology is applicable under the following conditions:</p> <ul style="list-style-type: none"> <li>(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;</li> <li>(b) In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power</li> </ul>	<p>The proposed project involves installing new wind power plants without integrating a Battery Energy Storage System (BESS). Thus, the mentioned criterion does not apply</p>

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 exigencies<sup>2</sup> 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/m<sup>2</sup>; or

c) The project activity results in new single or multiple reservoirs and the power density calculate equation (7), is greater than 4 W/m<sup>2</sup>.

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/m<sup>2</sup>, 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.

<p>capacity of the integrated project, as per equation (8), is greater than 4 W/m<sup>2</sup>;</p> <p>(ii) Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity;</p> <p>(iii) Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m<sup>2</sup> are:</p> <ul style="list-style-type: none"> <li>a) Lower than or equal to 15 MW; and</li> <li>b) Less than 10 per cent of the total installed capacity of integrated hydro power project.</li> </ul>	
<p>5) In the case of integrated hydro power projects, project proponent shall:</p> <ul style="list-style-type: none"> <li>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</li> <li>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.</li> </ul>	<p>The proposed project activity involves the installation of wind power plants/units. Therefore, the mentioned criteria are not applicable.</p>
<p>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.</p>	<p>The proposed project activity involves installing wind power plants/units. Therefore, the specified criteria are not applicable.</p>
<p>7) The methodology is not applicable to:</p> <ul style="list-style-type: none"> <li>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;</li> <li>b) Biomass-fired power plants;</li> </ul>	<p>The proposed project activity involves installing wind power plants/units. Therefore, the specified criteria are not applicable.</p>
<p>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</p>	<p>The proposed project activity involves installing wind power plants/units. Therefore, the specified criteria are not applicable.</p>

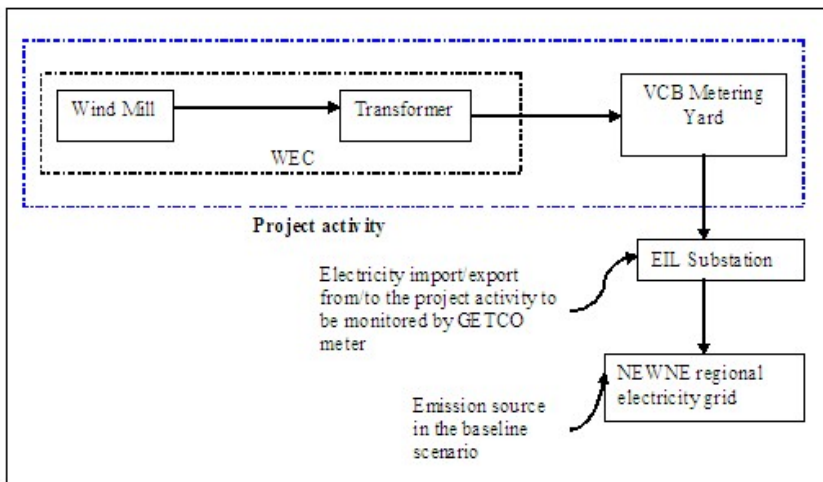
### B.3. Applicability of double counting emission reductions >>


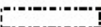
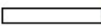
The project activity is registered under Clean Development Mechanism (CDM) project with registration number 4930, as well as Gold Standard (GS) with reference number 4425. The crediting period of this project under CDM & GS is 19/07/2011 to 18/07/2021. PP seeks verification under UCR from 01/08/2021 onwards, i.e., the crediting period for UCR starts from 01/08/2021 to 31/12/2031. Hence, there is no double counting for the said 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 63 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:



-  Represents project activity
-  Represents 1 unit of WEG
-  Represents project boundary

The baseline study of the Indian grid shows that the main sources of GHG emissions under the baseline scenario are CO<sub>2</sub> emissions from the conventional power generating systems. Other emissions are that of CH<sub>4</sub> and N<sub>2</sub>O but both emissions have been excluded for simplification. The project activity generates



Source		GHGs	Included?	Justification/Explanation
Baseline scenario	Grid connected electricity generation	CO <sub>2</sub>	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 <sub>2</sub> .
		CH <sub>4</sub>	No	No methane is expected to be emitted.
		N <sub>2</sub> O	No	No nitrous oxide is expected to be emitted.
Project Scenario	Greenfield wind energy conversion system	CO <sub>2</sub>	No	The project activity does not emit any emissions.
		CH <sub>4</sub>	No	No methane is expected to be emitted.
		N <sub>2</sub> O	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:

$$ER_y = BE_y - PE_y \quad \text{(Eq. 1)}$$

Where,

$ER_y$  = Emissions reductions in year y (t CO<sub>2</sub>)

$BE_y$  = Baseline emissions in year  $y$  (t CO<sub>2</sub>)  
 $PE_y$  = Project emissions in year  $y$  (t CO<sub>2</sub>)

### Baseline Emissions

The baseline emissions as per methodology ACM0002, Version 22.0, para 57; encompass solely the CO<sub>2</sub> 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 11 in year  $y$  can be calculated as follows:

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

Where:

$BE_y$  = Baseline emissions in year  $y$  (tCO<sub>2</sub>/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<sub>2</sub>/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 :

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

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)

A "grid emission factor" denotes the CO<sub>2</sub> emission factor (measured in tCO<sub>2</sub>/MWh) associated with each unit of electricity supplied by an electricity system. The UCR suggests employing an emission factor of 0.9<sup>1</sup> from 2013 to 2023 and Emission Factor of 0.757 tCO<sub>2</sub>/MWh for 2024 as a cautious estimate for Indian projects.

### 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

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<sup>1</sup>As per [UCR CoU Standard Update: 2024 Vintage UCR Indian Grid Emission Factor Announced | by Universal Carbon Registry | Jan, 2025 | Medium](#)

non-condensable gases, and emissions from water reservoirs of hydroelectric plants should be taken 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 )= 87,689 CoUs /year (87,689 tCO<sub>2eq</sub>/year)**

Year	Net Generation	Baseline Emissions	Project Emissions	Leakage	Emission Reductions	EF
	MWh	(tCO <sub>2e</sub> )	(tCO <sub>2e</sub> )	(tCO <sub>2e</sub> )	(tCO <sub>2e</sub> )	(tCO <sub>2</sub> /MWh)
Year 1	109625.44	98662.90	0.00	0.00	98662.90	0.9
Year 2	109625.44	98662.90	0.00	0.00	98662.90	0.9
Year 3	109625.44	98662.90	0.00	0.00	98662.90	0.9
Year 4	109625.44	82986.46	0.00	0.00	82986.46	0.757
Year 5	109625.44	82986.46	0.00	0.00	82986.46	0.757
Year 6	109625.44	82986.46	0.00	0.00	82986.46	0.757
Year 7	109625.44	82986.46	0.00	0.00	82986.46	0.757
Year 8	109625.44	82986.46	0.00	0.00	82986.46	0.757
Year 9	109625.44	82986.46	0.00	0.00	82986.46	0.757
Year 10	109625.44	82986.46	0.00	0.00	82986.46	0.757
<b>Total Emission reduction</b>	<b>1096254</b>	<b>876893</b>	<b>0</b>	<b>0</b>	<b>876893</b>	
Average Emission Reduction	109625	87689	0	0	87,689	

**B.6. Prior History>>**

The project activity is registered under Clean Development Mechanism (CDM) project with registration number 4930, as well as Gold Standard (GS) with reference number 4425. The crediting period of this project under CDM & GS was 19/07/2011 to 18/07/2021.

**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>>**

Crediting Period: 01/08/2021 to 31/12/2031

First Issuance Period: 3 years, 4 months, 30 days (excluding the end date) – 01-08-2021 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	‘Certificate for Share of Electricity Generated by Wind farm’ prepared & issued by SLDC/GETCO (Gujarat Energy Transmission Corporation)
Measurement methods and procedures	<p>- All the cluster meters and sub-station meters (main &amp; 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.</p> <p>-All the cluster meters and sub-station meters (main &amp; check meters) measure the electricity (export &amp; Import) on continuous basis and are recorded by state utility on monthly basis.</p> <p>Further all the reading of export &amp; import recorded at all the cluster meters and sub-station meters (main &amp; check meter) are available exclusively with GETCO officials and based on these reading, GETCO provides ‘Certificate for Share of Electricity Generated by Wind farm’ to PP, which provides quantity of net electricity generation supplied by the project activity to the grid</p> <p>In addition to above there is a possibility for the PP to record the values of EGCluster, Export &amp; EGCluster, Import. However, it would be impossible for the PP to collect information of EGCluster, WF, Export &amp; EGCluster, WF,</p>

	<p>Import, which is exclusively available with GETCO. Thus even if EG Cluster, Export and EG Cluster, Import is monitored, it has no value if the values EG Cluster, WF, Export and EG Cluster, WF, Import are not monitored. Hence only quantity of net electricity generation supplied by the project activity to the grid (<math>EG_{\text{facility}, y}</math>) could be monitored by the PP and this value will be sourced from 'Certificate for Share of Electricity Generated by Wind farm' prepared &amp; issued by SLDC/GETCO.</p> <p>Data Type: Measured  Monitoring equipment: Energy Meters are used for monitoring  Archiving Policy: Electronic  Calibration frequency: Once in 5 years <sup>2</sup>(considered as per provision of CEA India). The net electricity generated by the project activity will be calculated</p>
Value Applied	109625.44
Monitoring frequency	Monthly
Purpose of data	For baseline emission calculations

Data / Parameter:	<i>EF</i> Grid,y
Data unit:	tCO <sub>2</sub> /MWh
Description:	A "grid emission factor" refers to a CO <sub>2</sub> emission factor (tCO <sub>2</sub> /MWh) which will be associated with each unit of electricity provided by an electricity system. The UCR recommends an emission factor of 0.9 tCO <sub>2</sub> /MWh for the for the 2013 - 2020 years and 0.757 tCO <sub>2</sub> /MWh for the year 2024 as a fairly conservative estimate for Indian projects. Hence, the same emission factor has been considered to calculate the emission reduction under a conservative approach.
Source of data:	<a href="#">UCR CoU Standard Update: 2024 Vintage UCR Indian Grid Emission Factor Announced   by Universal Carbon Registry   Jan, 2025   Medium</a>
Measurement procedures (if any):	-
Monitoring frequency:	Ex-ante fixed parameter
QA/QC procedures:	For the calculation of Emission Factor of the grid
Any comment:	

<sup>2</sup>[meter\\_reg.pdf \(cea.nic.in\)](#)