Monitoring Report

CARBON OFFSET UNIT (CoU) PROJECT

Title: Enercon Wind Farm (Hindustan) Ltd in Rajasthan LTD

Version 1.2

UCR ID 105

Date 20/03/2025

Second CoU Issuance Period: 2years 11 Months

Monitoring Period: 01/02/2022 to 31/12/2024

Monitoring Report (MR)
CARBON OFFSET UNIT (CoU) PROJECT

Monitoring Report	
Title of the project activity	Enercon Wind Farm (Hindustan) Ltd in Rajasthan
UCR Project Registration Number	105
Version	1.2
Completion date of the MR	20/03/2025
Monitoring period number and duration of this monitoring period	Monitoring Period Number: 2nd Duration of this monitoring Period: (first and last days included (01/02/2022 to 31/12/2024)
Project participants	Project Owner- Wind World India Pvt Ltd Project Aggregator- Viviid Emissions Reductions Pvt. Ltd.
Host Party	India
Applied methodologies and standardized baselines	Consolidated methodology for grid-connected electricity generation from renewable sources, ACM0002, Version 6 Standardized baselines: Not applicable
Sectoral scopes	Sectoral Scope 1, Energy industries (renewable/ non-renewable sources)
Estimated amount of GHG emission reductions for this monitoring period in the registered PCN	2022: 67,760 tCO2eq 2023: 72,152 tCO2eq 2024: 46,342 tCO2eq
Estimated amount of total GHG emission reductions during this MR	**186,254tCO2eq**

SECTION A. Description of project activity

A.1. Purpose and general description of project activity >>

The Project Enercon Wind Farm (Hindustan) Ltd in Rajasthan is located in Kita and Pithodai KiDhani Village, District Jaisalmer, State Rajasthan, Country India. It is a wind-based power generation facility comprising 75 wind turbines.

a) Purpose of the project activity and the measures taken for GHG emission reductions >>

The purpose of the project activity is to utilize renewable wind energy for generation of electricity. The project activity replaces anthropogenic emissions of greenhouse gases (GHG's) into the atmosphere, which is 186,254 tCO2e for this monitoring period, by displacing the equivalent amount of electricity generation through the operation of existing fuel mix in the grid comprising mainly fossil fuel-based power plants and future capacity expansions connected to the grid. 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. Whereas the generated electricity is supplied to the Jaipur Discom under a long-term power purchase agreement (PPA)

b) Brief description of the installed technology and equipment>>

The Project involves 75-wind energy converters (WECs) of 800 kW E-48 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%.

c) Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods, etc.)>>

The first WEC under the project activity was commissioned on 26 November 2006 and the last WEC under the project activity was commissioned on 25 December 2006. The expected operational lifetime of the project is for 20 years.

The time frame for this monitoring period is from 01/02/2022 to
31/12/2024.
UCR Project ID or Date of Authorization: 105
Start Date of Crediting Period:15/03/2020
Project Commissioned: Details given below

Commissioning details

S.No	EWHPL UNIQUE ID	Loc No	Commissioning date
1	EWHPL 01	322	20-Dec-06
2	EWHPL 02	323	20-Dec-06
3	EWHPL 03	145	20-Dec-06
4	EWHPL 04	146	20-Dec-06
5	EWHPL 05	147	20-Dec-06
6	EWHPL 06	148	20-Dec-06
7	EWHPL 07	150	20-Dec-06
8	EWHPL 08	151	20-Dec-06
9	EWHPL 09	152	20-Dec-06
10	EWHPL 10	153	20-Dec-06
11	EWHPL 11	154	20-Dec-06
12	EWHPL 12	155	20-Dec-06
13	EWHPL 13	156	20-Dec-06
14	EWHPL 14	157	20-Dec-06
15	EWHPL 15	307	21-Dec-06
16	EWHPL16	306	21-Dec-06
17	EWHPL 17	300	20-Dec-06
18	EWHPL 18	301	20-Dec-06
19	EWHPL 19	304	21-Dec-06
20	EWHPL 20	305	21-Dec-06
21	EWHPL 21	161	20-Dec-06
22	EWHPL 22	160	20-Dec-06
23	EWHPL 23	159	20-Dec-06
24	EWHPL 24	324	21-Dec-06
25	EWHPL 25	167	20-Dec-06
26	EWHPL 26	168	26-Nov-06
27	EWHPL 27	169	26-Nov-06
28	EWHPL 28	170	26-Nov-06
29	EWHPL 29	326	21-Dec-06
30	EWHPL 30	177	25-Dec-06
31	EWHPL 31	178	25-Dec-06
32	EWHPL 32	179	25-Dec-06
33	EWHPL 33	181	25-Dec-06
34	EWHPL 34	183	25-Dec-06
35	EWHPL 35	184	25-Dec-06
36	EWHPL 36	186	25-Dec-06
37	EWHPL 37	190	25-Dec-06

38	EWHPL 38	191	25-Dec-06
39	EWHPL 39	192	25-Dec-06
40	EWHPL 40	193	25-Dec-06
41	EWHPL 41	194	25-Dec-06
42	EWHPL 43	218	21-Dec-06
43	EWHPL 42	219	21-Dec-06
44	EWHPL 44	220	25-Dec-06
45	EWHPL 45	221	25-Dec-06
46	EWHPL 46	222	25-Dec-06
47	EWHPL 47	223	21-Dec-06
48	EWHPL 48	224	21-Dec-06
49	EWHPL 49	225	21-Dec-06
50	EWHPL 50	226	21-Dec-06
51	EWHPL 51	230	21-Dec-06
52	EWHPL 52	232	21-Dec-06
53	EWHPL 53	233	21-Dec-06
54	EWHPL 54	329	21-Dec-06
55	EWHPL 55	234	21-Dec-06
56	EWHPL 56	236	21-Dec-06
57	EWHPL 57	237	21-Dec-06
58	EWHPL 58	238	20-Dec-06
59	EWHPL 59	328	20-Dec-06
60	EWHPL 60	241	20-Dec-06
61	EWHPL 61	242	20-Dec-06
62	EWHPL 62	245	20-Dec-06
63	EWHPL 63	246	26-Nov-06
64	EWHPL 64	249	26-Nov-06
65	EWHP 65	302	21-Dec-06
66	EWHPL 66	250	26-Nov-06
67	EWHPL 67	251	21-Dec-06
68	EWHPL 68	252	21-Dec-06
69	EWHPL 69	253	21-Dec-06
70	EWHPL 70	254	26-Nov-06
71	EWHPL 71	256	26-Nov-06
72	EWHPL 72	257	26-Nov-06
73	EWHPL 73	258	26-Nov-06
74	EWHPL 74	259	21-Dec-06
75	EWHPL 75	260	21-Dec-06

d) Total GHG emission reductions achieved or net anthropogenic GHG removals by sinks achieved in this monitoring period>>

The total GHG emission reductions achieved in this monitoring period is as follows:

Summary of the Project Activity and ERs Generated for the Monitoring Period	
Start date of this Monitoring Period	01/02/2022
Carbon credits claimed up to	31/12/2024
Total ERs generated (tCO2eq)	1,86,254 $tCO2e_q$
Leakage	0

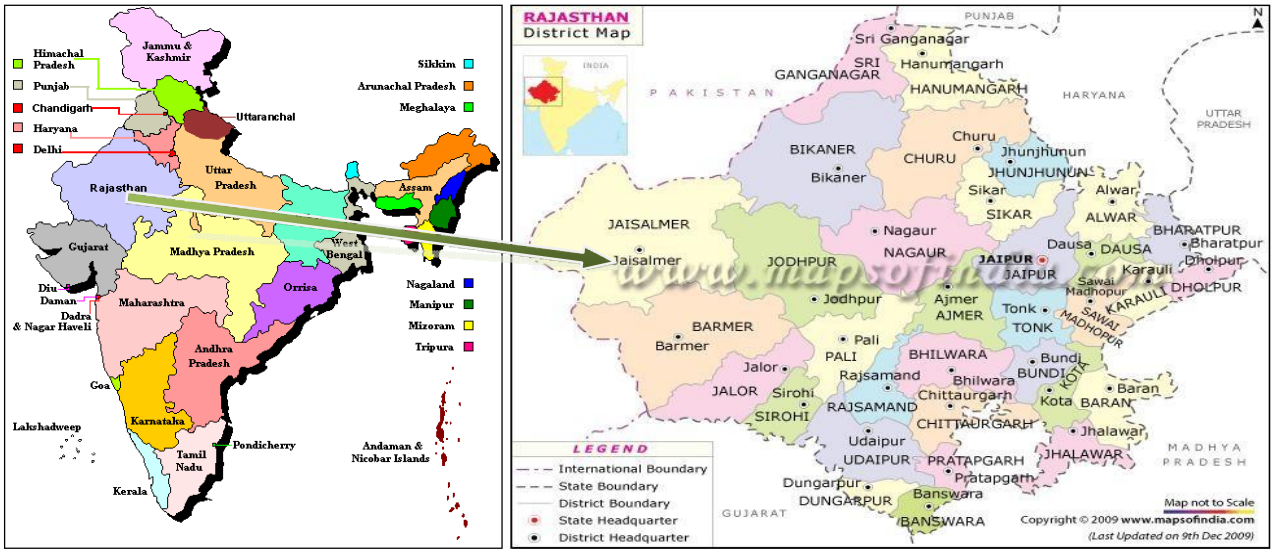
e) Baseline Scenario>>

Project activity installs the wind farm at a barren land. Project activity is the installations of green field energy production with the installation of 75 WEGs of WWIL make E 53 of 800 KW each totalling 60MW project capacity.

In the absence of the project activity the equivalent amount of electricity would have been generated from the connected/ new power plants in the NEWNE now known as INDIAN grid, which are/ will be predominantly based on fossil fuels[1], 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 emit any emissions in the atmosphere. Project activity will harness wind as a source of energy production which is environmentally safe and sound technology. There is no GHG emission through project activity. The WEGs confirms to the relevant code of safety and standards mandatory for setting up wind projects. The standard includes Wind Turbine Safety and Design, Noise level and Mechanical Load. Therefore, the technology implemented can be depicted as environmentally safe and sound one.

A.2. Location of project activity>>

Country: India
District: Jaisalmer
Village: Kita & Pithodai Ki Dhani
Tehsil: Fatehgarh
State: Rajasthan
Code: 345001



Individual WEG location numbers and coordinates are detailed out in below Table 1: -

S. No	EWHPL UNIQUE ID	Loc No	Latitude			Longitude		
			Deg.	Minute	Second	Deg.	Minute	Second
1	EWHPL 01	322	26	40	47.5	70	58	58.2
2	EWHPL 02	323	26	40	55.3	70	58	54.6
3	EWHPL 03	145	26	41	2.5	70	58	49.5
4	EWHPL 04	146	26	41	7.7	70	58	43.9
5	EWHPL 05	147	26	41	12.8	70	58	38.4
6	EWHPL 06	148	26	41	18	70	58	32.8
7	EWHPL 07	150	26	41	27	70	58	48.3
8	EWHPL 08	151	26	41	32.1	70	58	42.7
9	EWHPL 09	152	26	41	37.3	70	58	37.2
10	EWHPL 10	153	26	41	38.5	70	59	8.6
11	EWHPL 11	154	26	41	43.6	70	59	3.1
12	EWHPL 12	155	26	41	48	70	58	57.5
13	EWHPL 13	156	26	41	54.1	70	58	52.1
14	EWHPL 14	157	26	41	56.6	70	58	41.5
15	EWHPL 15	307	26	42	12	70	58	24.8

16	EWHPL16	306	26	42	17.2	70	58	19.3
17	EWHPL 17	300	26	42	47.4	70	58	24.4
18	EWHPL 18	301	26	42	43.9	70	58	30.7
19	EWHPL 19	304	26	42	26.8	70	58	46.6
20	EWHPL 20	305	26	42	21.7	70	58	52.2
21	EWHPL 21	161	26	42	16.5	70	58	57.7
22	EWHPL 22	160	26	42	9	70	59	2.2
23	EWHPL 23	159	26	42	1.3	70	59	6.7
24	EWHPL 24	324	26	42	5.7	70	59	23.9
25	EWHPL 25	167	26	42	38.3	70	59	0.2
26	EWHPL 26	168	26	42	42.9	70	58	56.3
27	EWHPL 27	169	26	42	49.6	70	58	54.4
28	EWHPL 28	170	26	42	56.5	70	58	52.7
29	EWHPL 29	326	26	43	22.4	70	58	50.2
30	EWHPL 30	177	26	42	54.5	70	59	29.3
31	EWHPL 31	178	26	42	49.4	70	59	34.9
32	EWHPL 32	179	26	42	44.2	70	59	40.5
33	EWHPL 33	181	26	42	32.2	70	59	50.9
34	EWHPL 34	183	26	42	59	70	59	50.6
35	EWHPL 35	184	26	43	5.8	70	59	45.8
36	EWHPL 36	186	26	43	17.8	70	59	35.4
37	EWHPL 37	190	26	43	25.1	70	59	50.1
38	EWHPL 38	191	26	43	18.3	70	59	54.9
39	EWHPL 39	192	26	43	13.2	71	0	0.5
40	EWHPL 40	193	26	43	8	71	0	6.1
41	EWHPL 41	194	26	43	2.9	71	0	11.6
42	EWHPL 43	218	26	45	31.3	71	0	32
43	EWHPL 42	219	26	45	17.2	71	0	23.1
44	EWHPL 44	220	26	44	52.6	71	0	38.2
45	EWHPL 45	221	26	44	52.5	71	0	47.2
46	EWHPL 46	222	26	44	45.9	71	0	55.9
47	EWHPL 47	223	26	44	56.1	71	1	5.4
48	EWHPL 48	224	26	45	1.9	71	1	16.3
49	EWHPL 49	225	26	44	43.9	71	1	23
50	EWHPL 50	226	26	44	38.8	71	1	35.9
51	EWHPL 51	230	26	44	24.9	71	1	55.5
52	EWHPL 52	232	26	44	19.9	71	2	1.7
53	EWHPL 53	233	26	44	14.1	71	2	7.3
54	EWHPL 54	329	26	44	30.1	71	2	16
55	EWHPL 55	234	26	44	20.5	71	2	27.9

56	EWHPL 56	236	26	43	57.4	71	2	22.2
57	EWHPL 57	237	26	43	55.8	71	2	30.9
58	EWHPL 58	238	26	43	56.9	71	2	39.7
59	EWHPL 59	328	26	44	8.9	71	2	56.5
60	EWHPL 60	241	26	43	58.7	71	2	59.9
61	EWHPL 61	242	26	43	51.8	71	3	5.1
62	EWHPL 62	245	26	44	30.5	71	3	32.5
63	EWHPL 63	246	26	44	32.5	71	3	22.5
64	EWHPL 64	249	26	45	9.4	71	3	14.1
65	EWHP 65	302	26	44	51.4	71	2	56.1
66	EWHPL 66	250	26	44	58.1	71	2	52.3
67	EWHPL 67	251	26	45	0.4	71	2	44.6
68	EWHPL 68	252	26	45	0.8	71	2	32.4
69	EWHPL 69	253	26	45	4.3	71	2	25.6
70	EWHPL 70	254	26	45	14.2	71	2	15.9
71	EWHPL 71	256	26	45	23.8	71	2	25.8
72	EWHPL 72	257	26	45	39.3	71	2	47.5
73	EWHPL 73	258	26	45	42.8	71	2	37.2
74	EWHPL 74	259	26	45	46.6	71	2	26.5
75	EWHPL 75	260	26	45	48.3	71	2	18.7

A.3. Parties and project participants

Party (Host)	Participants
Government of India (Host)	Viviid Emissions Reductions Pvt. Ltd.

A.4. References to methodologies and standardized baselines >>

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

TYPE I - Renewable Energy Projects

CATEGORY- ACM0002 Grid-connected electricity generation from renewable sources, Version 06

The project activity is wind based renewable energy source, zero emission power project connected to the Rajasthan state grid, which forms part of the Indian grid. The project activity will displace fossil fuel-based electricity generation that would have otherwise been provided by the operation and expansion of the fossil fuel-based power plants in Indian grid.

A.5. Crediting period of project activity >>

Duration of the crediting period corresponding to this monitoring period: 01/02/2022 to 31/12/2024
Length of the crediting period corresponding to this monitoring period: 2 years 11 Months

A.6. Contact information of responsible persons/entities >>

Contact Person- Lokesh Jain
Email- lokesh.jain@viviidgreen.com
Phone no- 91 89208 56146
Address- Sri Krishna Complex, New Link Road, Opp. Laxmi Industrial Estate, Andheri (West), Mumbai - 400053

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity >>

a) Provide information on the implementation status of the project activity during this monitoring period in accordance with UCR PCN>>

The Project involves 75-wind energy converters (WECs) of 800 kW E-48 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 first WEC under the project activity was commissioned on 26 November 2006 and the last WEC under the project activity was commissioned on 25 December 2006. The expected operational lifetime of the project is for 20 years.

The electricity generated from the project activity is transmitting to Bhu substation through 4 feeders. The WECs of the project activity and WECs of other power producers are connected to Bhu Substation which is further connected to Akal substation. In addition to the project activity, the WECs located at Kita, Jodha, Pithoda Ki Dhani are connected to Bhu substation which are further connected to the Akal substation.

An Energy meter at 220 kV (accuracy Class-0.2) at Bhu Substation is termed secondary 'Back up meter' and Energy meters at 220 kV/400kV (accuracy Class-0.2) at Akal substation has one 'Main Meter' & one back up meter. Net Electricity supplied by the WECs is being metered at a common metering/delivery point. The common metering/delivery point comprises of one main meter that is installed at 220 kV/400kV metering point at the GSS Akal substation and one backup meter which is also installed at 220kV/400kV at Akal substation. Consequently, the main meter reading reflects the aggregate electricity supplied by all these WECs, including the project activity. The net electricity supplied by individual WEC is being determined by following a process of allocating the total electricity recorded at the main meter to the individual WEC in proportion of the electricity generation recorded by the LCS meters at the individual WEC. The apportioning for electricity export and import is done by Wind World (India) Limited based on which invoices are raised for individual customers. These invoices can be cross verified by cheque copies by the DOE**.**

The procedure for allocation is detailed below:

$E_{JMR,Export}$ = Gross Electricity exported, as recorded by the main meter at the substation. This data represents the total gross electricity exported by all the WECs (project and non-project) at substation point.

$E_{JMR,Import}$ = Gross Electricity imported, as recorded by the main meter at the substation. This data represents the total gross electricity imported by all the WECs (project and non-project) at substation point.

$E_{Controller,Export,i}$ = Gross Electricity exported (at WEC point at the site) by a WEC (project or non-project), as measured at the LCS meter. Each WEC has exclusive LCS meter that records gross

electricity export from the WEC (project or non-project). This gross electricity exported by the WEC (at WEC point at the site)

$E_{Controller,Export,j}$ and $E_{Controller,Export,k}$ are subsets of $E_{Controller,Export,i}$

where i is any value between 1 to j+k

j represents WECs of the project activity (1 to 75) connected to main meter & backup meter at Akal substation and secondary backup meter at Bhu substation.

k represents WECs of the non-project (76 to 290) connected to main meter & backup meter at Akal substation and secondary backup meter at Bhu substation.

$\sum E_{Controller,Export,i}$ = Summation of gross electricity exported (at WEC point at the site) by all the WECs (project and non-project) connected to the main meter at the substation, measured at the LCS meter of each WEC. This is summation of gross electricity exported by the WECs (at WEC point at the site) including WECs of the project and non-project.

$E_{WEC,Export,j}$ = Gross Electricity exported (at substation point) by an individual WEC of the project to the grid that is connected to main meter & backup meter. Thus, this data can be used to compute electricity export (at substation point) for individual WEC.

$E_{WEC,import,j}$ = Gross Electricity imported (at substation point) by an individual WEC of the project from the grid that is connected to main meter & backup meter. Thus, this data can be used to compute electricity import (at substation point) for individual WEC.

$\sum_{Project} E_{WEC,Export,j}$ = Summation of gross electricity exported (at substation point) by all the WECs of the project activity.

$\sum_{Project} E_{WEC,Import,j}$ = Summation of gross electricity imported (at substation point) by all the WECs of the project activity.

Gross Electricity exported by each WEC is apportioned on the basis of gross electricity export recorded at the LCS meter of each WEC and the gross electricity export recorded at the main meter mentioned in the JMR. The export multiplication factor is calculated as follows-

$$\text{Export Multiplication factor} = \frac{E_{JMR,Export}}{\sum E_{Controller,Export,i}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Thus, the energy exported by an individual WEC of the project activity to the grid is given by the equation-

$E_{WEC,Export,j}$ = Export Multiplication factor x $E_{Controller,Export,j}$ ……... (2)

As the LCS meter doesn't record import, the apportioning of energy import by each WEC is also done on the basis of electricity export recorded at the LCS meter of each WEC and the electricity import recorded at the main meter and mentioned in the JMR. The import multiplication factor is calculated as follows-

$$\text{Import Multiplication factor} = \frac{E_{JMR,import}}{\sum E_{Controller,Export,i}} \quad \text{…… (3)}$$

Thus, the energy imported by an individual WEC of the project activity to the grid is given by the equation-

$$E_{WEC,import,j} = \text{Import Multiplication factor} \times E_{Controller,Export,j} \text{ ……...}$$

(4) The net electricity supplied by the WECs of the project is given by the equation-

$$EG_y = \sum_{Project} E_{WEC,Export,j} - \sum_{Project}' E_{WEC,import,j} \quad \text{……... (5)}$$

The summation is done on the WECs belonging to the project activity.

The apportioning for electricity export and import is done by Wind World (India) Limited based on which invoices are raised for individual customers. These invoices can be cross verified by the cheque copies by the DOE.

Joint Meter Reading is generated on 1st day of every month. Representatives of RRVPN/Ajmer & Jaipur DISCOM and Wind World (India) Limited jointly take the main & backup reading and sign the meter reading on the first day of every month. Simultaneously, the joint meter reading at the 220 kV level of the secondary backup metering system at Akal substation is also being taken by representatives of RRVPN/Ajmer & Jaipur DISCOM and Wind World (India) Limited.

Calibration of the Main meters will be carried out once in five (5) years as per National Standards (as per the provision of CEA[1], India) and faulty meters will be duly replaced immediately as per the provision of power purchase agreement.

Meter Detail

Meter Type	Meter Sr. No.	Sub-station	Accuracy class	Make	Calibration Details	Calibration Validity
Main Meter	15624842	Akal	0.2	L & T	15-03-2021	14-03-2026
Backup Meter	15624844	Akal	0.2	L & T		

For the current monitoring period i.e. 01/02/2022 to 31/12/2024, the calibration was done on 15-03-2021 and is valid till 14-03-2026. Hence, there is no calibration delay.

[1] https://cea.nic.in/wp-content/uploads/2020/02/meter_reg.pdf

b) For the description of the installed technologies, technical process and equipment, include diagrams, where appropriate>>

The Project involves 75-wind energy converters (WECs) of 800 kW E-48 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%.

Wind World (India) Limited has secured and facilitated the technology transfer for wind based renewable energy generation from Enercon GmbH and has established a manufacturing plant at Daman in India where, along with other components the "Synchronous Generators" using "Vacuum Impregnation" technology are manufactured. The other salient features of the state-of-art- technology are as follows:

- The ENERCON E-48 features a gearless construction, with the rotor and generator mounted on the same shaft, eliminating the need for a gearbox.
- It operates at variable speeds ranging from 16 to 30 rpm, ensuring optimal efficiency across different wind conditions.
- The turbine employs a variable pitch system, with each blade having an independent pitch control mechanism and emergency power supply, maximizing energy capture.
- It maintains a near-unity power factor, enhancing the quality and efficiency of power delivery to the grid.
- The design ensures minimal reactive power draw from the grid, typically less than 1% of the generated kWh.
- The turbine is engineered to prevent voltage peaks, contributing to grid stability and equipment longevity.
- It can operate effectively within a voltage fluctuation range of -20% to +20%, accommodating grid variability.
- The low-speed generator, with a maximum speed of 30 rpm, eliminates the need for mechanical brakes, reducing wear and tear.
- The braking system comprises three independent blade pitch systems with emergency power supply, a rotor brake, and a rotor lock, ensuring safety and reliability.
- The generator achieves its rated output of 800 kW at just 30 rpm, highlighting its efficiency in energy conversion.
- The turbine incorporates an integrated lightning protection system within the blades,

safeguarding against electrical storms.

- It starts generating power at wind speeds as low as 3 m/s, maximizing energy capture even in low-wind conditions.

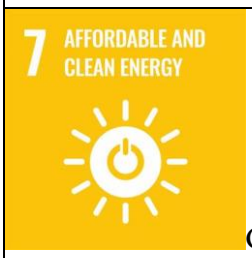
Component	Details
Rated Power	800 kW
Rotor Diameter	48 m
Hub Height	50 / 55 / 60 / 76 m
Wind Zone	D1 WZ
Wind Class (IEC)	IEC/NVN ILA
WEC Concept	Gearless, variable speed; single blade adjustment
Rotor Type	Upwind rotor with active pitch control
Rotor Rotation Direction	Clockwise
Number of Blades	3
Swept Area	1,810 m²
Blade Material	GRP / Epoxy resin, with built-in lightning protection
Rotational Speed	Variable, 16 - 31.5 rpm
Pitch Control	ENERCON single blade pitch system with emergency supply
Main Bearing	Twin tapered roller bearing
Generator Type	ENERCON direct-drive annular generator
Yaw System	Active via yaw gear, load-dependent damping
Braking System	Rotor brake and rotor lock

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

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

United Nations Sustainable Development Goals:

The project activity supports the following SDGs

SDG Goals	Description
 Goal 7	This project plays a key role in advancing SDG 7 by providing a renewable source of energy that is both sustainable and environmentally responsible. By tapping into wind power, we are able to reduce reliance on traditional fossil fuels, lowering emissions and helping communities access cleaner, more affordable electricity.
 Goal 8	This project activity generates additional employment in the operations and maintenance of the wind farm for the local people. This project will achieve full and productive employment and decent work.
 Goal 13	The Enercon Wind Farm (Hindustan) Ltd in Rajasthan meets the SDG 13 goal by displacing fossil fuel with clean energy. This project will reduce **186,254** tCO_2 emissions.

- **Social benefits:**
    - The project activity will lead to the development of supporting infrastructure such as road network etc., in the wind park location, the access to which is also provided to the local population.
    - The project activity will lead to alleviation of poverty by establishing direct and indirect benefits through employment generation and improved economic activities by strengthening of local grid of the state electricity utility.
    - Use of a renewable source of energy reduces the dependence on imported fossil fuels and associated price variation thereby leading to increased energy security.

- **Environmental benefits:**
    - The project activity employs renewable energy source for electricity generation instead of fossil fuel-based electricity generation which would have emitted gaseous, liquid and/or solid effluents/wastes.
    - Being a renewable resource, using wind energy to generate electricity contributes to resource conservation. Thus, the project causes no negative impact on the surrounding environment and contributes to environmental well-being.

- **Economic benefits:**
    - The project activity requires temporary and permanent, skilled and semi-skilled manpower at the wind park; this will create additional employment opportunities in the region.
    - The generated electricity will be fed into the NEWNE now known as INDIA's regional grid through local grid, thereby improving the grid frequency and availability of electricity to the local consumers (villagers & sub-urban habitants) which will provide new opportunities for industries and economic activities to be set up in the area thereby resulting in greater local employment, ultimately leading to overall development.

- **Technical benefits:**
    - Increased interest in wind energy projects will further push R&D efforts by technology providers to develop more efficient and better machinery in future.

B.3. Baseline Emissions>>

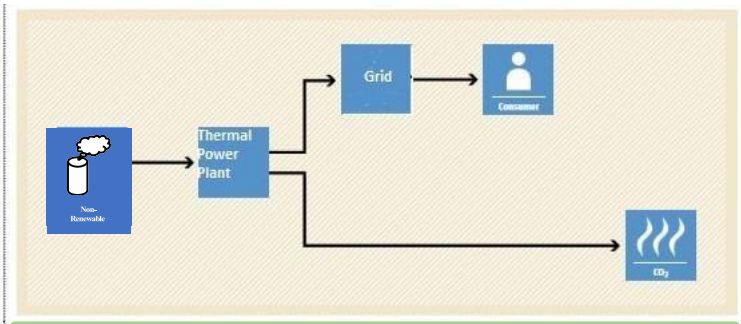
Project activity installs the wind farm at a barren land. Project activity is the installations of green field energy production with the installation of 75 WEGs of WWIL make E 53 of 800 KW each totalling 60MW project capacity.

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[2], 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 emit any emissions in the atmosphere.

Project activity will harness wind as a source of energy production which is environmentally safe and sound technology. There is no GHG emission through project activity. The WEGs confirms to the relevant code of safety and standards mandatory for setting up wind projects. The standard includes Wind Turbine Safety and Design, Noise level and Mechanical Load. Therefore, the technology implemented can be depicted as environmentally safe and sound one.

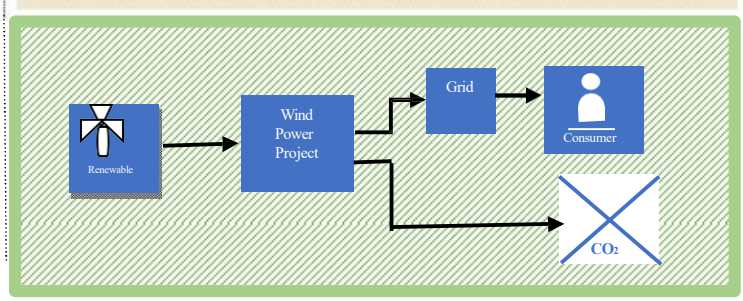
BASELINE SCENARIO

Thermal energy would be produced by more-GHG-intensive means based on the use of non-renewable sources



PROJECT SCENERIO

Project activity will harness wind as a source of energy production which is environmentally safe and sound technology. There is no GHG emission through project activity.



B.4. Debundling>>

This project is not a debundled component of a larger registered carbon offset project activity.

SECTION C. Application of methodologies and standardized baselines

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

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

TYPE I- **Renewable Energy Projects**

CATEGORY- ACM0002.: "Grid connected electricity generation from renewable sources Version 06."

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

The project activity is wind based renewable energy source, zero emission power project connected to the Rajasthan state grid, which forms part of the Indian grid. The project activity will displace fossil fuel-based electricity generation that would have otherwise been provided by the operation and expansion of the fossil fuel-based power plants in Indian grid.

The approved consolidated baseline and monitoring methodology ACM0002 Version 06 is the choice of the baseline and monitoring methodology, and it is applicable because:

Para No.	Applicability Conditions as per ACM 0002	Applicability to this Project Activity
1.	The project activity is the installation capacity addition, retrofit or replacement of a power plant/unit of one of the following types: • Hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir) • Wind power plant/unit, • Geothermal power plant/unit, • Solar power plant/unit, • Wave power plant/unit • Tidal power plant/unit.	The project activity is the installation of a new grid connected renewable power generation from wind.

2.	In the case of capacity additions, retrofits or replacements: the existing plant 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 or retrofit of the plant has been undertaken between the start of this minimum historical reference period and implementation of the project activity;	This condition is not relevant, as the project activity does not involve capacity additions, retrofits or replacements.
3.	In case of hydro power plants: • The project activity is implemented in an existing reservoir, with no change in the volume of reservoir. • The project activity is implemented	This condition is not relevant, as the project activity is not the installation of a hydro power plant.
	in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m2. • The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than 4 W/m2.	
4.	The methodology is not applicable to the following: • 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; • Biomass fired power plants; • Hydro power plants that result in new reservoirs or in the increase in existing reservoirs where the power density of the power plant is less than 4 W/m2.	The project activity does not involve any of the given criteria, hence methodology is applicable for the project activity.
5.	In the case of retrofits, 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, i.e. to use the power generation equipment that was already in use	The project activity is a new wind power plant. No replacement, modification or retrofit measures are implemented here. Hence, this criterion is also not relevant to the project activity.

	prior to the implementation of the project activity and undertaking business as usual maintenance".	

C. 3 Applicability of double counting emission reductions >>

The project activity is registered under Clean Development Mechanism (CDM) project with registration number 1168, as well as Gold Standard (GS) with reference number 2483. The crediting period of this project under CDM & GS is 15/03/2010 to 14/03/2020. PP seeks verification under UCR from 15/03/2020 onwards, i.e., crediting period for UCR starts from 15/03/2020. Hence, there is no double counting for said projects. The details of CERs issued and GS CERs labelled is given below:

CDM 1168

Weblink: https://cdm.unfccc.int/Projects/DB/SGS-UKL1181742063.57/view

Monitoring period	**CERs Issued**
15/03/2010 to 30/09/2010	48250
01/10/2010 to 31/08/2011	65767
01/09/2011 to 30/06/2012	59272
01/07/2012 to 30/09/2012	29089
01/10/2012 to 31/08/2013	66401
01/09/2013 to 31/01/2015	89017
01/02/2015 to 31/05/2016	86167
01/06/2016 to 31/08/2017	63492
01/09/2012 to 30/09/2012	Awaiting Issuance

GS 2483

Weblink: platform.sustain-cert.com/public-project/391

Monitoring Period	Issued GS CERs
01/07/2012 to 30/09/2012	29,089
01/10/2012 to 31/08/2013	66,401
01/09/2013 to 31/01/2015	89,017
01/02/2015 to 31/05/2016	86,167
01/06/2016 to 31/08/2017	63,492
01/09/2012 to 30/09/2012	Awaiting Issuance

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

Project boundary has ascertained using ACM0002 v06- "The spatial extent of the project boundary includes the project power plant/unit, and all power plants/units connected physically to the electricity system that the CDM project power plant is connected to".
Hence the project boundary includes the WTGs, sub-station, grid and all power plants connected to grid. The proposed project activity will evacuate power to the Indian grid.

	Source	Gas	Included?	Justification/ Explanation
Baseline	Electricity generation from power plants connected to the Northern Grid	CO_2	Included	Main emission source
		CH_4	Excluded	This source is not required to be estimated for wind energy projects under ACM0002
		N_2O	Excluded	This source is not required to be estimated for wind energy projects under ACM0002
Project Activity	Electricity generation from the Project	CO_2	Excluded	Wind energy generation does not have any direct GHG emissions.
		CH_4	Excluded	
		N_2O	Excluded	

C.5. Establishment and description of baseline scenario (UCR Protocol) >>

According to ACM0002, for project activities that do not modify or retrofit an existing electricity generation facility, the baseline scenario is the following:
Electricity delivered to the grid by the project 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 below.

As the Project does not modify or retrofit an existing generation facility, the baseline scenario is the emissions generated by the operation of grid-connected power plants and by the addition of new generation sources. This is estimated using calculation of Combined Margin multiplied by electricity delivered to the grid by the Project.
According to the approved baseline methodology ACM0002, the emission reductions ***ERy*** by the project activity during a given year "y^1" is

ERy = BEy – PEy – Ly ***(1)***
Where *BEy* is the baseline emissions
PEy is project activity emissions and;
Ly is the amount of emissions leakage resulting from the project activity.

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

BEy = EGy * EFy ***(2)***

where *EGy* is the electricity supplied to the grid, *EFy* is the CO2 emission factor of the grid,
A "grid emission factor" denotes the CO2 emission factor (measured in tCO2/MWh) associated with each unit of electricity supplied by the grid. A grid emission factor of 0.9 tCO2/MWh is recommended for the years 2013-2023 as a conservative estimate for Indian projects not previously verified under any GHG program. Similarly, for the year 2024, a grid emission factor of 0.757 tCO2/MWh is to be applied. These conservative factors are used to calculate emission reductions.
UCRCoUStandardAug2022updatedVer6_090822220127104470.pdf (rackcdn.com)
UCR CoU Standard Update: 2024 Vintage UCR Indian Grid Emission Factor Announced | by

Universal Carbon Registry | Jan, 2025 | Medium[2]

Project Emissions:
The project activity uses wind power to generate electricity and hence the emissions from the project activity are taken as nil.
PEy = 0

Leakage:
Emissions Leakage on account of the project activity is ignored in accordance with ACM0002.

Ly = 0

Current Monitoring Period baseline emissions
= 0.9 tCO2/MWh x 155484.213kWh +0.757 tCO2/MWh x 61235.033 kWh
= 186,254tCO2e

Sr. No.	Year	EGy, Net Generation	EGy, Net Generation	Emission Factor	COUs
		kWh	MWh	tCO2/ MWh	tCO2e
1	2022	7,53,03,048.00	75,303.05	0.900	67,760
2	2023	8,01,81,165.00	80,181.17	0.900	72,152
3	2024	6,12,34,932.00	61,234.93	0.757	46,342
Total		**21,67,19,145.00**	**2,16,719.15**		**1,86,254**

Total Baseline Emission Reduction (BEy)=186,254 tCO2eq

C.6. Prior History>>

The project activity is registered as CDM project with reference number 1168 and as GS project with reference number 2483 for generation or issuance of carbon credits with fixed crediting period from 15/03/2010 to 14/03/2020.

C.7. Monitoring period number and duration>>

[2] https://a23e347601d72166dcd6-16da518ed3035d35cf0439f1cdf449c9.ssl.cf2.rackcdn.com/Documents/UCRCoUStandardAug2022updatedVer6_090822220127104470.pdf

Second Issuance Period : 2 Year 11 Months

Monitoring Period : 01/02/2022 to 31/12/2024

C.8. Changes to start date of crediting period >>

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

C.9. Permanent changes from PCN monitoring plan, applied methodology or applied standardized baseline >>

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

C.10. Monitoring plan>>

Data/Parameter	**EGy**
Data unit	MWh (Mega-Watt hour)
Description	Net electricity supplied to the grid by the Project
Source of data Value(s) applied	Electricity supplied to the grid as per monthly breakup sheet prepared by Wind World (India) Limited and the same will cross verified by the tariff invoices raised on RRVPNL/Ajmer & Jaipur DISCOM (State Utility). **216,719 MWh**

Measurement methods and procedures	The WECs of the project activity and WECs of other power producers are connected to Bhu Substation which is further connected to Akal substation. In addition to the project activity, the WECs located at Kita, Jodha, Pithoda ki Dhani are also connected to Bhu substation which are further connected to the Akal substation. Net Electricity supplied by all these WECs is metered at a common metering/delivery point. The common metering/delivery point comprises one main meter and one backup meter that are installed at 220 kV/400 kV metering/delivery point at the Akal substation. Consequently, the main meter reading reflects the aggregate electricity supplied by all these WECs, including the project activity. The net electricity supplied by individual WEC is determined by a process of allocating the total electricity recorded at the main meter to the individual WEC in proportion to the electricity generation recorded by the LCS meters at the individual WEC. It can be sourced from breakup sheet issued by O & M contractor and cross checked by invoices raised by project owner to EB.
Monitoring frequency	Monthly
Purpose of data	Baseline Emissions calculations

Data / Parameter:	$\sum_{Project} E_{WEC,Export,j}$
Data unit:	MWh (Mega-Watt hour)
Description:	Summation of gross electricity exported (at substation point) by all the WECs of the project activity. Where j is any WEC between 1 to 75 of the project activity connected to main meter & backup meter at Akal substation and secondary backup meter at Bhu substation.
Source of data Value(s) applied	Electricity supplied to the grid as per monthly breakup sheet prepared by Wind World (India) Limited and the same will cross verified by the tariff invoices raised on RRVPNL/Ajmer & Jaipur DISCOM (State Utility). **216,970.206 MWh**
Measurement procedures (if any):	Calculation prepared by Wind World (India) Limited
Monitoring frequency:	Monthly
Purpose of data	Baseline Emissions calculations

Data / Parameter:	$\sum_{Project} E_{WEC,Import,j}$

Data unit:	MWh (Mega-Watt hour)
Description:	Summation of gross electricity imported (at substation point) by all the WECs of the project activity. Where J is any WEC between 1 to 75 of the project activity connected to main meter & backup meter at Akal substation and secondary backup meter at Bhu substation.
Source of data Value(s) applied	Electricity sourced from the grid as per monthly breakup sheet prepared by Wind World (India) Limited and the same will cross verified by the tariff invoices raised on RRVPNL/Ajmer & Jaipur DISCOM (State Utility). **251.061 MWh**
Measurement procedures (if any):	Calculation prepared by Wind World (India) Limited
Monitoring frequency:	Monthly
Purpose of data	Baseline Emissions calculations