PROJECT CONCEPT NOTE

CARBON OFFSET UNIT (CoU) PROJECT

Title: "49.6 MW Wind Project by Torrent Green Energy Pvt Ltd in Gujarat"

Version 1.1
Date: 16/07/2025
First CoU Issuance Period: 5 years 1 month
Date: 01-12-2019 to 31-12-2024

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

BASIC INFORMATION	
Title of the project activity	"49.6 MW Wind Project by Torrent Green Energy Pvt Ltd in Gujarat"
Scale of the project activity	Large Scale
Completion date of the PCN	16/07/2025
Project participants	**Torrent Green Energy Private Limited**
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	**953,861** CoUs **(953,861** tCO_{2eq})

SECTION A. Description of project activity

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

The project activity titled "49.6 MW Wind Project by Torrent Green Energy Pvt Ltd in Gujarat" is located in Lalpur village, Jamnagar district, Gujarat, India.

The details of the project are as follows:

Purpose of the project activity:
The project is a renewable wind energy initiative developed by Torrent Green Energy Pvt Ltd (TGPL), dedicated to generating electricity through wind power. It consists of 62 Wind Turbine Generators (WTGs), each with a capacity of 800 kW, efficiently harnessing wind energy for sustainable electricity production. The first WTG was commissioned on 04/02/2012, and the final one was commissioned on 14/03/2012.

The Project activity is a cornerstone of TGPL's commitment to combating climate change through renewable energy. With an annual estimated generation of **81316 MWh,** the project displaces fossil fuel-based power, significantly reducing approximately **66,784 (tCO2e)** greenhouse gas (GHG) emissions annually.

SITE	Loc No.	MAIN_SITE	TALUKA_DIST	STATE	CAPACITY (MW)	WTG Make	COMM_DATE
BHANGOL-LALPUR	450	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	04-Feb-12
BHANGOL-LALPUR	454	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	04-Feb-12
BHANGOL-LALPUR	393	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	04-Feb-12
BHANGOL-LALPUR	451	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	04-Feb-12
BHANGOL-LALPUR	452	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	04-Feb-12
BHANGOL-LALPUR	455	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	04-Feb-12
BHANGOL-LALPUR	456	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	04-Feb-12

BHANGOL-LALPUR	458	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	04-Feb-12
BHANGOL-LALPUR	459	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	04-Feb-12
BHANGOL-LALPUR	411	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	07-Feb-12
KABARKA-LALPUR	407	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	09-Feb-12
KABARKA-LALPUR	416	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	09-Feb-12
KABARKA-LALPUR	420	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	09-Feb-12
KABARKA-LALPUR	396	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	09-Feb-12
KABARKA-LALPUR	382	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	09-Feb-12
KABARKA-LALPUR	383	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	09-Feb-12
MORZAR-LALPUR	401	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	09-Feb-12
MORZAR-LALPUR	402	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	09-Feb-12
BHANGOL-LALPUR	403	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	13-Feb-12
MORZAR-LALPUR	405	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	13-Feb-12
MORZAR-LALPUR	406	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	13-Feb-12
MORZAR-LALPUR	408	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	13-Feb-12

CHOKHANDA-LALPUR	409	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	13-Feb-12
CHOKHANDA-LALPUR	412	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	13-Feb-12
SHEDHAKHAI-LALPUR	417	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	13-Feb-12
SHEDHAKHAI-LALPUR	418	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	13-Feb-12
SHEDHAKHAI-LALPUR	419	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	13-Feb-12
SHEDHAKHAI-LALPUR	376	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	13-Feb-12
SHEDHAKHAI-LALPUR	377	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	13-Feb-12
LALPUR	278	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	18-Feb-12
LALPUR	289	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	18-Feb-12
LALPUR	74	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	18-Feb-12
LALPUR	375	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	18-Feb-12
LALPUR	225	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	21-Feb-12
LALPUR	265	SHEDHAKHAI-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	21-Feb-12
TEBHADA-LALPUR	266	TEBHADA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	03-Mar-12
TEBHADA-LALPUR	267	TEBHADA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	03-Mar-12

TEBHADA-LALPUR	269	TEBHADA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	03-Mar-12
TEBHADA-LALPUR	270	TEBHADA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	03-Mar-12
TEBHADA-LALPUR	272	TEBHADA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	03-Mar-12
TEBHADA-LALPUR	274	TEBHADA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	05-Mar-12
TEBHADA-LALPUR	275	TEBHADA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	03-Mar-12
TEBHADA-LALPUR	276	TEBHADA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	03-Mar-12
TEBHADA-LALPUR	277	TEBHADA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	03-Mar-12
TEBHADA-LALPUR	279	TEBHADA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	05-Mar-12
TEBHADA-LALPUR	280	TEBHADA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	03-Mar-12
TEBHADA-LALPUR	281	TEBHADA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	03-Mar-12
TEBHADA-LALPUR	285	TEBHADA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	03-Mar-12
TEBHADA-LALPUR	287	TEBHADA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	05-Mar-12
DHARAMPUR-LALPUR	288	TEBHADA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	05-Mar-12
DHARAMPUR-LALPUR	290	TEBHADA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	05-Mar-12
DHARAMPUR-LALPUR	291	TEBHADA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	05-Mar-12

GHUNDA-LALPUR	226	TEBHADA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	12-Mar-12
GHUNDA-LALPUR	227	TEBHADA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	12-Mar-12
GHUNDA-LALPUR	228	TEBHADA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	12-Mar-12
GHUNDA-LALPUR	229	GHUNDA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	12-Mar-12
GHUNDA-LALPUR	230	GHUNDA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	12-Mar-12
GHUNDA-LALPUR	231	GHUNDA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	12-Mar-12
GHUNDA-LALPUR	232	GHUNDA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	12-Mar-12
GHUNDA-LALPUR	233	TEBHADA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	14-Mar-12
GHUNDA-LALPUR	234	GHUNDA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	14-Mar-12
TEBHADA-LALPUR	235	TEBHADA-LALPUR	JAMNAGAR	GUJARAT	0.8	E-53	12-Mar-12

LOCATION DETAILS OF WTGs:

	Decimal Degrees	
Location no	**Latitude**	**Longitude**
450	22.06730	69.97187
454	22.05489	69.95476
393	22.08021	69.92147
451	22.06468	69.96755
452	22.06639	69.96304
455	22.05361	69.95536
456	22.05220	69.95606
458	22.04847	69.96465
459	22.04747	69.96883
411	22.12609	69.95098
407	22.12365	69.93789
416	22.11671	69.95467
420	22.11062	69.95942
396	22.08981	69.93216

382	22.11259	69.91604
383	22.11240	69.91094
401	22.09837	69.94570
402	22.10050	69.94515
403	22.10139	69.94186
405	22.10845	69.94110
406	22.11593	69.93916
408	22.12581	69.93789
409	22.13046	69.93232
412	22.12471	69.95315
417	22.11462	69.95416
418	22.11387	69.95732
419	22.11199	69.95909
376	22.13699	69.89329
377	22.13530	69.89838
278	22.04014	69.82854
289	22.02873	69.82609
74	22.13756	69.89870
375	22.13278	69.89324
225	22.10672	69.82444
265	22.03720	69.76488
266	22.03686	69.77392
267	22.03983	69.77472
269	22.04858	69.78328
270	22.05351	69.78093
272	22.03912	69.79825
274	22.03631	69.80739
275	22.03568	69.80992
276	22.04201	69.80974
277	22.04494	69.80752
279	22.03822	69.83055
280	22.03616	69.82995
281	22.03608	69.83354
285	22.03201	69.84069
287	22.02868	69.83137
288	22.02511	69.83066
290	22.01323	69.81240
291	22.01100	69.81390
226	22.10534	69.82734
227	22.10316	69.82714
228	22.10097	69.82770
229	22.09871	69.82834
230	22.09636	69.82555
231	22.10932	69.83634
232	22.10801	69.84048

233	22.10622	69.84137
234	22.10168	69.84241
235	22.08902	69.82381

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 SDG 3: Good Health and Well-Being  	➢ A key social activity includes providing counselling and support to rural adolescent girls in villages around SUGEN, Dahej, and Indrad, specifically addressing menstrual hygiene and sanitation. ➢ This initiative not only promotes preventive healthcare but also empowers young girls with knowledge and dignity, reducing stigma and absenteeism from school due to menstruation-related issues
Goal SDG 6: Clean Water and Sanitation  	➢ Additionally, park maintenance work was carried out for Parimal Garden and eight other public parks under Phase I and Phase II, such as Sindhu Bhavan Park, Thaltej Park, Sabarmati Kids Park, and others. ➢ These green space developments help enhance urban biodiversity, promote community well-being, and support ecological restoration.
GOAL SDG 13: Climate Action  	➢ This 49.9 MW wind power project meets the SDG 13 goal by saving fossil fuel and producing clean energy. This project is expected to reduce **667841 $\underline{tCO_2}$** annually. ➢ In the Greenfield project, electricity delivered to the grid by the project would have otherwise been generated by the operation of grid connected power plants. 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.
GOAL SDG 4: Quality Education	➢ The Kendra's creation of a new library, housing over 300,000 handwritten manuscripts, 400,000 books, and a digital archive, supports lifelong learning and access to knowledge. ➢ The Acharya Shri Kailassagarsuri Gyanmandir is a globally recognized research center for Jainism and Indology, providing

	resources for scholars, students, and the public. Initiatives like the Manuscriptology course further promote education in ancient languages and cultural preservation.
GOAL SDG 11: Sustainable Cities and Communities 	➢ The Kendra's efforts to protect national heritage, art, and culture through its museum (Samrat Samprati Sangrahalaya) and preservation of Jain manuscripts contribute to safeguarding cultural heritage. ➢ The museum preserves rare Jain art, architecture, and artifacts, making cultural heritage accessible to the public
GOAL SDG 11: Decent work & economic growth 	➢ Decent work and economic growth. This project generates additional employment for skilled and unskilled people, also the project situated in remote areas will provide employment opportunities to unskilled people from villages. The training on various aspects including safety, operational issues and developing skill set will also be provided to employees ➢ This project will achieve full and productive employment and decent work.
GOAL SDG 7: AFFORDABLE & CLEAN ENERGY 	➢ 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 solar energy (renewal resource) to generate power. The project activity will increase the share of renewable resource-based electricity to global mix of energy consumption.

A.3. Location of project activity >>

Village **Lalpur,** District **Jamnagar,** State **Gujarat**, Country **India.**

A.4. Technologies/measures >>

The project activity is a new 49.6 MW wind power project, which consists of 62 machines of E-53 type Wind Energy Converters (WECs) of 800 KW capacities each.

The E-53 is a medium-capacity wind turbine manufactured by Enercon, with a rated power output of 800 kW. It uses direct-drive (gearless) technology, which increases efficiency and reduces maintenance needs. The cut-in speed is low (3.0 m/s), making it suitable for moderate wind regions, while its cut-out speed is 34 m/s, and it can survive wind speeds up to 59.5 m/s, showing strong design resilience.

Main component of the windmill is explained below:

Main Tower:
This is a very tall structure with a door and inside ladder at the bottom. The door is used to enter into the tower for operation and maintenance.

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

Nacelle:

The Nacelle is the one which contains all the major parts of a windmill. 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 connects 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.

Wind Turbine Specification Table (E-53 by Enercon)

Category	Parameter	Value
Power Ratings	Rated Power	800.0 kW
	Flexible Power Ratings	-
	Cut-in Wind Speed	3.0 m/s
	Rated Wind Speed	12.0 m/s
	Cut-out Wind Speed	34.0 m/s
	Survival Wind Speed	59.5 m/s
	Wind Zone (DIBt)	II
	Wind Class (IEC)	-
Rotor	Diameter	52.9 m
	Swept Area	2,198.0 m²
	Number of Blades	3
	Max Rotor Speed	28.3 U/min
	Tip Speed	78 m/s
	Type	AERO E-53
	Material	GFK (Glass Fiber Reinforced Plastic)
	Manufacturer	Enercon
	Power Density 1	364.0 W/m²
	Power Density 2	2.7 m²/kW
Gearbox	Type	Without (Direct Drive)
	Stages / Ratio / Mfr.	-
Generator	Type	Synchronous
	Number	1.0
	Max Speed	28.3 U/min
	Voltage	690.0 V
	Grid Connection	IGBT
	Grid Frequency	50.0 Hz
	Manufacturer	Enercon
Tower	Hub Height	60 / 73 m
	Type	Steel tube / Hybrid
	Shape	Conical

	Corrosion Protection	Painted
	Manufacturer	Enercon
Weight	Single Blade / Hub / Rotor / Nacelle / Tower / Total	Not Provided

WASP Engineering has been used to predict the maximum extreme wind values at the mast locations and extrapolate them to the WTG locations using wind flow modelling with the roughness map.

sr no	HUB_HEIGHT	ROTAR_DIA	ELEVATION_MSL	BLADE_TYPE
1	74 Mtr	52.9 Mtr	125	E53/1
2	74 Mtr	52.9 Mtr	125	E53/1
3	74 Mtr	52.9 Mtr	121	E53/1
4	74 Mtr	52.9 Mtr	120	E53/1
5	74 Mtr	52.9 Mtr	125	E53/1
6	74 Mtr	52.9 Mtr	125	E53/1
7	74 Mtr	52.9 Mtr	122	E53/1
8	74 Mtr	52.9 Mtr	120	E53/1
9	74 Mtr	52.9 Mtr	125	E53/1
10	74 Mtr	52.9 Mtr	122	E53/1
11	74 Mtr	52.9 Mtr	103	E53/1
12	74 Mtr	52.9 Mtr	98	E53/1
13	74 Mtr	52.9 Mtr	95	E53/1
14	74 Mtr	52.9 Mtr	90	E53/1
15	74 Mtr	52.9 Mtr	90	E53/1
16	74 Mtr	52.9 Mtr	85	E53/1
17	74 Mtr	52.9 Mtr	80	E53/1

18	74 Mtr	52.9 Mtr	80	E53/1
19	74 Mtr	52.9 Mtr	120	E53/1
20	74 Mtr	52.9 Mtr	80	E53/1
21	74 Mtr	52.9 Mtr	80	E53/1
22	74 Mtr	52.9 Mtr	78	E53/1
23	74 Mtr	52.9 Mtr	88	E53/1
24	74 Mtr	52.9 Mtr	90	E53/1
25	74 Mtr	52.9 Mtr	90	E53/1
26	74 Mtr	52.9 Mtr	90	E53/1
27	74 Mtr	52.9 Mtr	88	E53/1
28	74 Mtr	52.9 Mtr	90	E53/1
29	74 Mtr	52.9 Mtr	103	E53/1
30	74 Mtr	52.9 Mtr	95	E53/1
31	74 Mtr	52.9 Mtr	90	E53/1
32	74 Mtr	52.9 Mtr	130	E53/1
33	74 Mtr	52.9 Mtr	125	E53/1
34	74 Mtr	52.9 Mtr	125	E53/1
35	74 Mtr	52.9 Mtr	130	E53/1
36	74 Mtr	52.9 Mtr	167	E53/1
37	74 Mtr	52.9 Mtr	166	E53/1
38	74 Mtr	52.9 Mtr	155	E53/1
39	74 Mtr	52.9 Mtr	130	E53/1
40	74 Mtr	52.9 Mtr	115	E53/1

41	74 Mtr	52.9 Mtr	110	E53/1
42	74 Mtr	52.9 Mtr	110	E53/1
43	74 Mtr	52.9 Mtr	110	E53/1
44	74 Mtr	52.9 Mtr	134	E53/1
45	74 Mtr	52.9 Mtr	136	E53/1
46	74 Mtr	52.9 Mtr	141	E53/1
47	74 Mtr	52.9 Mtr	150	E53/1
48	74 Mtr	52.9 Mtr	146	E53/1
49	74 Mtr	52.9 Mtr	143	E53/1
50	74 Mtr	52.9 Mtr	145	E53/1
51	74 Mtr	52.9 Mtr	131	E53/1
52	74 Mtr	52.9 Mtr	140	E53/1
53	74 Mtr	52.9 Mtr	150	E53/1
54	74 Mtr	52.9 Mtr	180	E53/1
55	74 Mtr	52.9 Mtr	182	E53/1
56	74 Mtr	52.9 Mtr	200	E53/1
57	74 Mtr	52.9 Mtr	200	E53/1
58	74 Mtr	52.9 Mtr	195	E53/1
59	74 Mtr	52.9 Mtr	190	E53/1
60	74 Mtr	52.9 Mtr	190	E53/1
61	74 Mtr	52.9 Mtr	200	E53/1
62	74 Mtr	52.9 Mtr	118	E53/1

A.5. Parties and project participants >>

Party (Host)	Participants
INDIA	**PP:** Torrent Green Energy Private Limited **Aggregator**: Viviid Emissions Reductions Universal Private Limited **Address:** 1001-B, Sri Krishna Complex, New Link Road, Opp. Laxmi Industrial Estate, Andheri West, Maharashtra 400053.

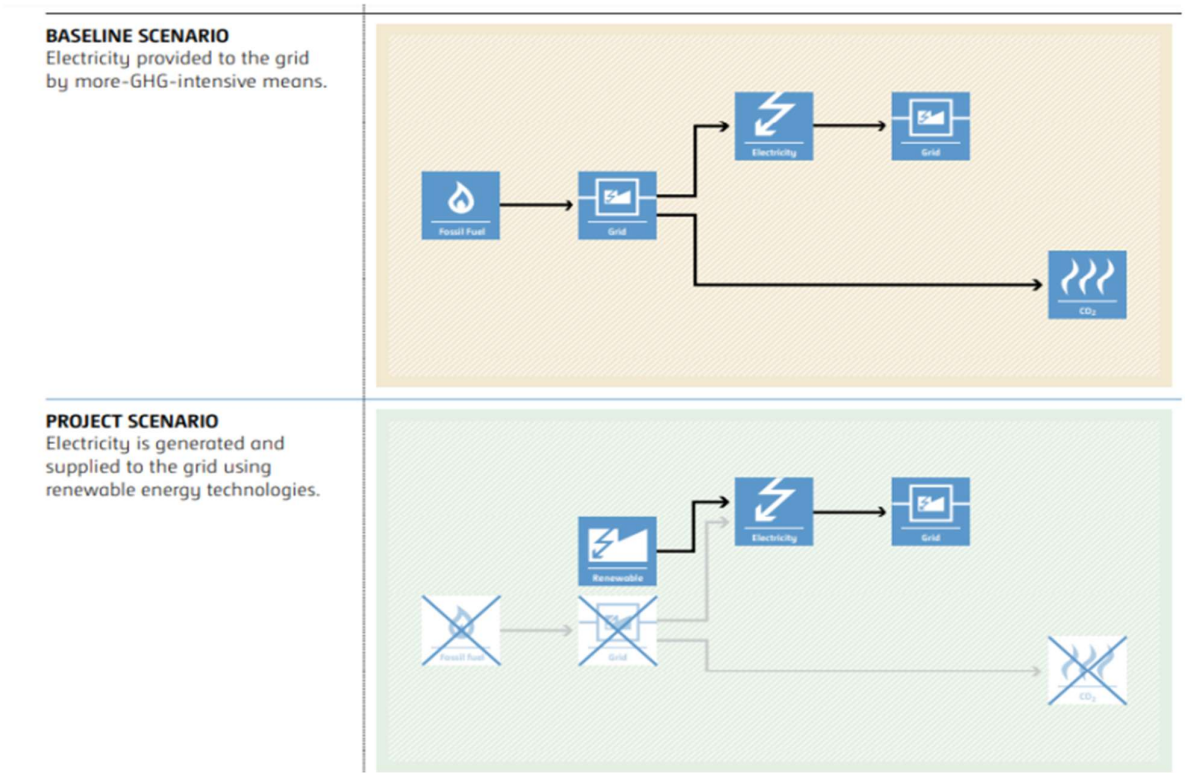
A.6. Baseline Emissions>>

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**
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:	The proposed project involves installing new wind power plants

(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 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	without integrating a Battery Energy Storage System (BESS). Thus, the mentioned criterion does not apply
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	The proposed project involves the installation of wind power plants/units. Hence, the mentioned criterion is not applicable.

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 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	The proposed project activity involves installing wind power plants/units. Therefore, the specified criteria are not applicable.

of the project activity and undertaking business as usual maintenance	

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

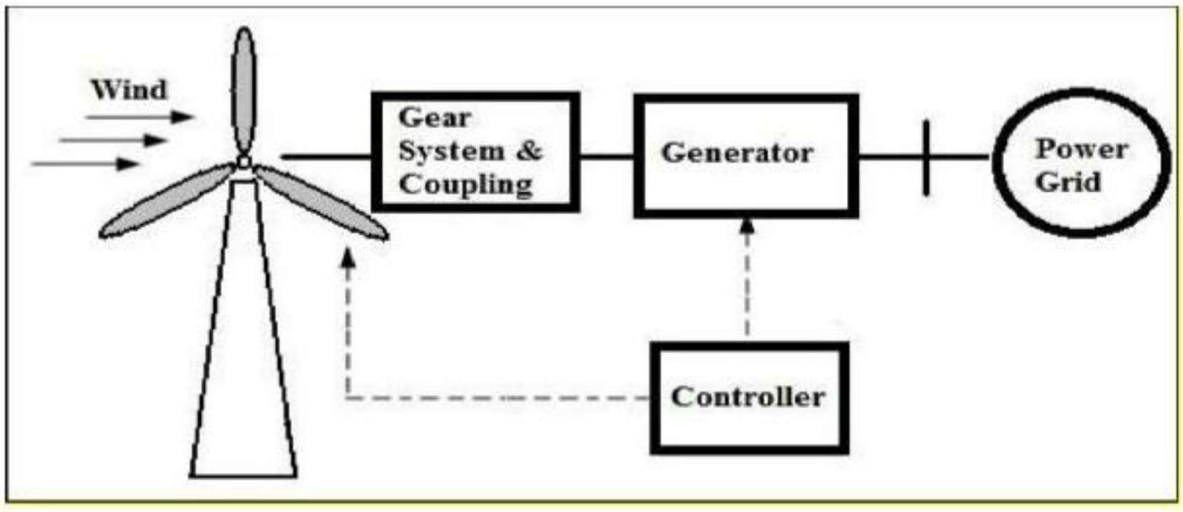
The project activity is registered under the Clean Development Mechanism (CDM) project with registration number 8324[1]. The crediting period of this project under CDM is 23/11/2012 to 22/11/2019. PP seeks verification under UCR from 01/12/2019 onwards, i.e., crediting period for UCR starts from 01/12/2019. Hence, there is no double counting for the said project.

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

According to the methodology ACM0002, version 22.0.0 the spatial extent of the project boundary includes the project power plant, and all power plants connected physically to the electricity system that the project power plant is connected to.

The project boundary includes the WECs of the project activity, transformer, individual meters, substation & Indian which is final consumer of generated electricity.

A schematic of project boundary diagram is shown below.



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.

[1] CDM 8324

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 (UCR Standard or Methodology) **>>**

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)

BE_y = Baseline emissions in year y (t CO2)

PE_y = 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 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_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 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:

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

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 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[2] from 2013 to 2023 and Emission Factor of 0.757 tCO2/MWh for 2024 as a cautious estimate for Indian projects. The same emission factor is utilized for computing emission reductions for the Project Activity.

Project Emission:

Regarding project emissions, ACM0002 version 22.0 specifies that only emissions related to fossil

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

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 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).

Estimated annual or total baseline emission reduction (BEy) = 66,784 CoUs/year (66,784) $tCO_{2/year}$

Year	Net Generation	Baseline Emissions	Project Emissions	Leakage	Emission Reductions	EF
	MWh	(tCO_2e)	(tCO_2e)	(tCO_2e)	(tCO_2e)	(tCO2/MWh)
01-12-2019-31-12-2019	7601.89	6841.00	0.00	0.00	6841.00	0.9
01/01/2020- 01/12/2020	89506.18	80555.00	0.00	0.00	80555.00	0.9
01/01/2021- 01/12/2021	89506.18	80555.00	0.00	0.00	80555.00	0.9
01/01/2022- 01/12/2022	89506.18	80555.00	0.00	0.00	80555.00	0.9
01/01/2023- 01/12/2023	89506.18	80555.00	0.00	0.00	80555.00	0.9
01/01/2024- 01/12/2024	89506.18	67756.00	0.00	0.00	67756.00	0.757
01/01/2025- 01/12/2025	89506.18	67756.00	0.00	0.00	67756.00	0.757
01/01/2026- 01/12/2026	89506.18	67756.00	0.00	0.00	67756.00	0.757
01/01/2027- 01/12/2027	89506.18	67756.00	0.00	0.00	67756.00	0.757
01/01/2028- 01/12/2028	89506.18	67756.00	0.00	0.00	67756.00	0.757
Total Emission reduction	**813157**	**667841**	**0**	**0**	**667841**	
Annual Average	81316	66,784	0	0	66,784	

B.6. Prior History>>

The project activity is registered under the Clean Development Mechanism (CDM) project with registration number 8324. The crediting period of this project under CDM is 23/11/2012 to 22/11/2019. PP seeks verification under UCR from 01/12/2019 onwards, i.e., crediting period for UCR starts from 01/12/2019.

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

The start date of the crediting period under UCR is considered from 01/12/2019.

B.8. 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

B.9. Monitoring period number and duration>>

First Issuance Period: 5 Years 1 Month – **01-12-2019 to 31-12-2024**

B.8. Monitoring plan>>

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

Data/Parameter	EGy, net
Data unit	MWh
Description	Net electricity supplied to the grid by the Project activity.
Measurement methods and procedures	Data Type: Measured Monitoring equipment: Energy Meters are used for monitoring Calibration frequency: once in five years (as per CEA Indian provision) Cross checking: Quantity of net electricity supplied to or consumed at PP's facility will be cross-checked from the monthly bills or invoices raised. The Net electricity supplied to the grid will be calculated by the values of electricity export to the grid.The Net electricity is recorded as follows: Thus, $EG_{PJ,y} = EG_{Net,Export}$
Value Applied	**81316** (Annualized average value has been considered here for an ex-ante estimation only, whereas this is an-ex post parameter hence actual value shall be applied during monitoring and verification)
Monitoring frequency	The net energy exported to the grid is measured every month using calibrated energy meter by the State Electricity Board authorities in the presence of the project implementer or its representatives. The meter/s shall be jointly inspected and sealed by authorised representatives of the company and the state utility. Measuring procedure: Will be measured by an export-import energy meter. The net electricity exported by the project plant would either be directly sourced as a measured parameter or be calculated by deducting the amount of imported electricity from the total amount of exported electricity. Accuracy class of energy meter: 0.2s Calibration Frequency: As per the Central Electricity Authority the testing and calibration frequency should be once in five years[3].
Purpose of data	For baseline emission calculations

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

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

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 period 2013 - 2023 and 0.757 tCO2/MWh from 2024 as a fairly conservative estimate for Indian projects. Hence, the same emission factor has been considered to calculate the emission reduction under conservative approach.
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:	-