



PROJECT CONCEPT NOTE

CARBON OFFSET UNIT (CoU) PROJECT



Title: 42.5 MW Wind Power Project by BPCL in Karnataka

Version 1.0

Date 05/09/2024

First CoU Issuance Period: 7 years, 1 month

Date: 26/11/2015 to 31/12/2023



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

BASIC INFORMATION

Title of the project activity	42.5 MW Wind Power Project by BPCL in Karnataka
The scale of the project activity	Large-Scale Wind Project
Completion date of the PCN	12/09/2024
Project participants	BHORUKA POWER CORPORATION 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	7,70,665 CoUs (7,70,665 tCO_{2eq})
Annual Average total GHG emission reductions	85,629 CoUs

SECTION A. Description of project activity

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

The "BHORUKA POWER CORPORATION LTD 42.5 MW Karnataka" project, located in Yelisirur Village, Gadag District, Karnataka State, India, has been effectively commissioned by Karnataka Power Transmission Corporation Limited (KPTCL). The Chief Electrical Inspector to the Government of Karnataka granted commissioning and interconnection approvals, while the Chief Engineer (T&QC) at KPTCL provided respective permissions.

Purpose of the project activity:

The project aims to harness wind energy as a sustainable alternative for generating electricity, thereby reducing the carbon footprint attributable to human activities. By replacing electricity generation from existing and planned fossil fuel-based plants connected to the grid, the project mitigates emissions equivalent to those produced by such plants. The utilization of Wind Energy Converters (WEC) facilitates emission-free electricity production. Below is a summary of the dates on which the installed Wind Turbine Generators were put into operation:

Sr. No.	Make	Capacity	Commissioning Date
1	GE India Industrial Pvt. Ltd	1.7 MW	26.11.2015
2	GE India Industrial Pvt. Ltd	1.7 MW	26.11.2015
3	GE India Industrial Pvt. Ltd	1.7 MW	26.11.2015
4	GE India Industrial Pvt. Ltd	1.7 MW	26.11.2015
5	GE India Industrial Pvt. Ltd	1.7 MW	26.11.2015
6	GE India Industrial Pvt. Ltd	1.7 MW	26.11.2015
7	GE India Industrial Pvt. Ltd	1.7 MW	26.11.2015
8	GE India Industrial Pvt. Ltd	1.7 MW	26.11.2015
9	GE India Industrial Pvt. Ltd	1.7 MW	26.11.2015
10	GE India Industrial Pvt. Ltd	1.7 MW	26.11.2015
11	GE India Industrial Pvt. Ltd	1.7 MW	26.11.2015
12	GE India Industrial Pvt. Ltd	1.7 MW	26.11.2015
13	GE India Industrial Pvt. Ltd	1.7 MW	26.11.2015
14	GE India Industrial Pvt. Ltd	1.7 MW	26.11.2015
15	GE India Industrial Pvt. Ltd	1.7 MW	26.11.2015
16	GE India Industrial Pvt. Ltd	1.7 MW	11.07.2017
17	GE India Industrial Pvt. Ltd	1.7 MW	11.07.2017
18	GE India Industrial Pvt. Ltd	1.7 MW	11.07.2017
19	GE India Industrial Pvt. Ltd	1.7 MW	11.07.2017
20	GE India Industrial Pvt. Ltd	1.7 MW	11.07.2017
21	GE India Industrial Pvt. Ltd	1.7 MW	11.07.2017
22	GE India Industrial Pvt. Ltd	1.7 MW	11.07.2017
23	GE India Industrial Pvt. Ltd	1.7 MW	11.07.2017
24	GE India Industrial Pvt. Ltd	1.7 MW	11.07.2017
25	GE India Industrial Pvt. Ltd	1.7 MW	11.07.2017

The project is expected to generate approximately 97,766 MWh of electricity per year, which will

be supplied to KPTCL by the project owner under a Power Purchase Agreement. Through the utilization of wind energy, the project plays a role in mitigating greenhouse gas emissions, particularly CO₂ equivalents, which would otherwise originate from fossil fuel-powered thermal plants. The projected annual average reduction in CO₂ equivalents from the project is estimated at 87,989 tonnes, with actual reductions to be documented during the initial monitoring and verification phase.

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

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

Social Benefits:

- The project's implementation will support the establishment of vital infrastructure such as road networks within the wind park vicinity, enhancing accessibility and directly benefiting the local community.
- Through the creation of employment opportunities and the bolstering of the local grid managed by the state electricity utility, the project will play a significant role in poverty alleviation and fostering economic growth.
- By harnessing renewable energy sources, the project reduces dependence on imported fossil fuels, thus mitigating price fluctuations and strengthening energy security.

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.



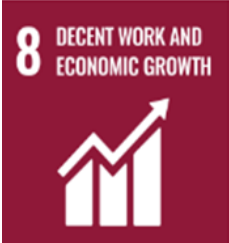

Economic Benefits:

- The project offers employment prospects to both trained and semi-skilled workers within the wind park vicinity, encompassing temporary as well as permanent positions, thereby facilitating local economic advancement.
- Through power generation, the regional grid's performance will be enhanced, leading to increased accessibility and stability for local residents, consequently driving economic and industrial development in the vicinity and creating additional employment opportunities.

• Technical Benefits:

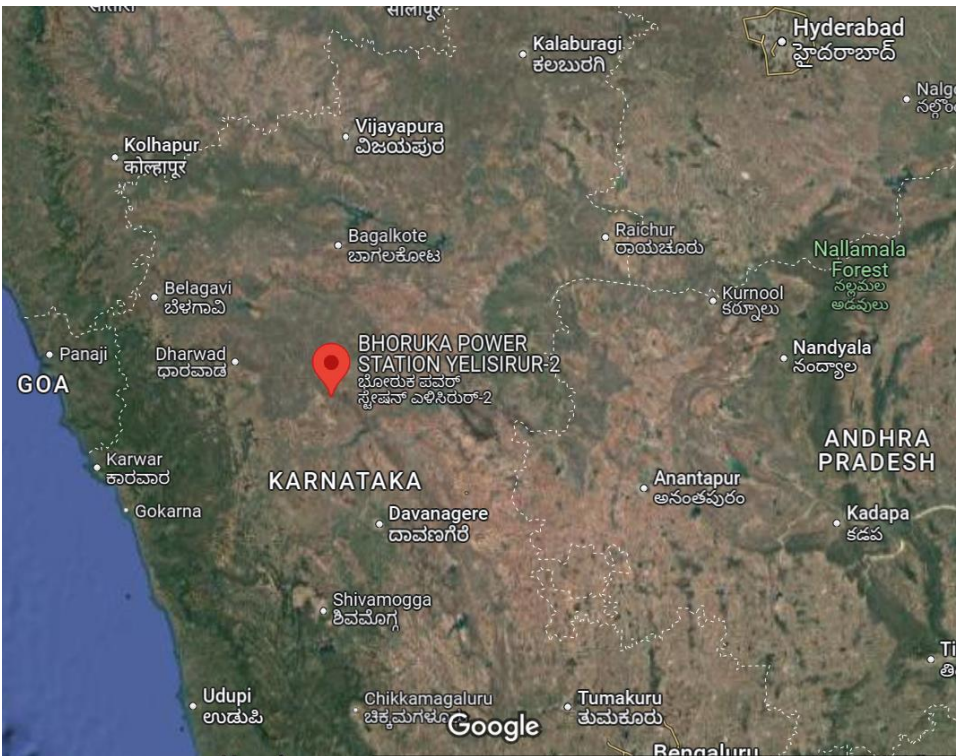
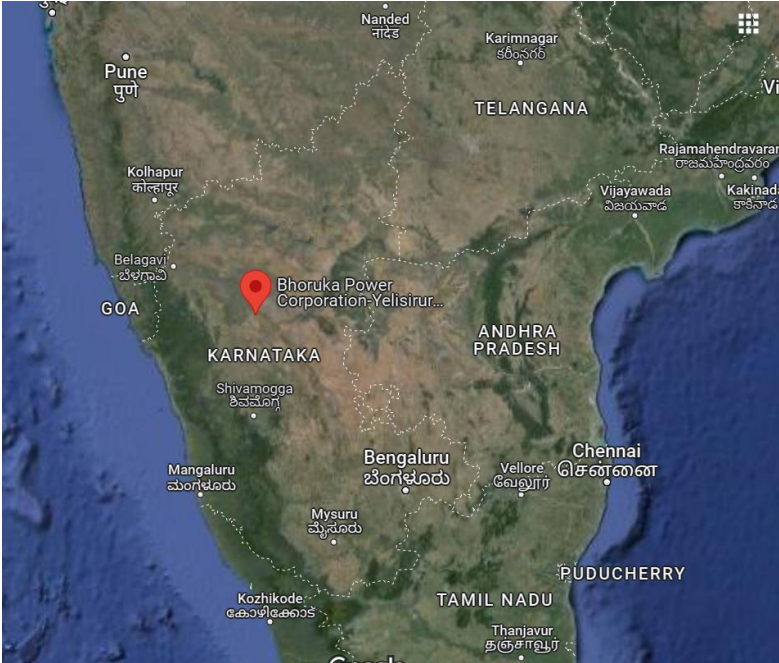
- The utilization of wind energy offers technical advantages such as minimal mechanical complexity and modularity, facilitating easier maintenance and scalability compared to conventional energy systems.
- Increased support for wind energy projects will spur technological companies' R&D efforts, which will lead to the creation of more advanced and efficient gear in the upcoming years.

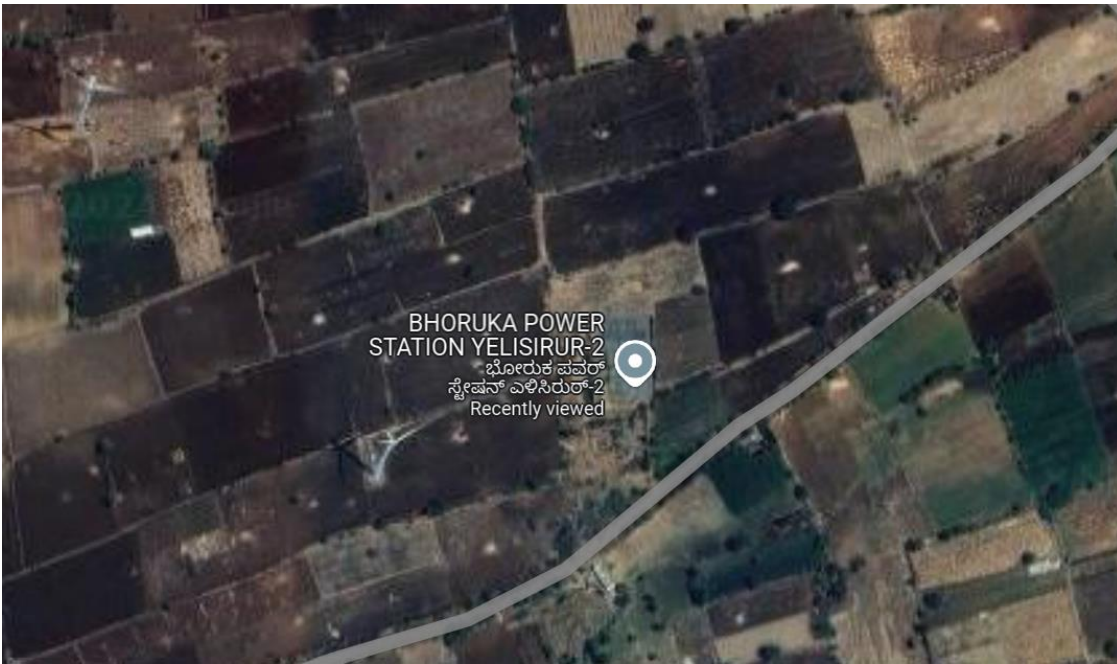
United Nations Sustainable Development Goals:

SDGs	Contribution
<p>SDG 3: Good Health and Well-being</p> 	<ul style="list-style-type: none"> - Decreases air pollution from fossil fuel emissions, leading to better air quality and fewer respiratory illnesses. - Supports improved health outcomes by enhancing access to healthcare services through job creation and economic development.
<p>SDG 7: Affordable and Clean Energy</p> 	<ul style="list-style-type: none"> - Advances SDG 7 by generating renewable energy, offering a cleaner alternative to fossil fuels. - Reduces reliance on imported fossil fuels, helping stabilize energy prices and improve regional energy security.
<p>SDG 8: Decent Work and Economic Growth</p> 	<ul style="list-style-type: none"> - Creates short-term and long-term employment opportunities in construction, maintenance, and administrative roles. - Encourages local economic growth by reinforcing regional grid infrastructure, which boosts industrial activities and job creation.
<p>SDG 13: Climate Action</p> 	<ul style="list-style-type: none"> - Lowers greenhouse gas emissions by replacing fossil fuel-based electricity, supporting SDG 13. - Cuts approximately 87,989 tons of CO2 emissions each year, significantly mitigating climate change through renewable energy solutions.

A.3. Location of project activity >>

Country: India
Village: Yelिसिरur
District: Gadag
State: Karnataka
Code: 582120





A.4. Technologies/measures >>

During the project's implementation, Electric Wind Energy's GE 1.7 – 103 turbines have been selected for installation at the Yelisirur site. A procurement strategy has been devised to acquire 25 units of these turbines, each with a capacity of 1.7 MW, aiming to harness an estimated annual energy potential of 97.76 MU. The primary components of the wind turbines are delineated as follow

- **Rotor:** The rotor, with three adjustable blades, optimizes energy capture in varying wind conditions, enhancing overall efficiency and performance.
- **Gearbox:** Specially designed for high performance and noise reduction, the gearbox ensures smooth operation and longevity of the wind turbine system.
- **Braking Systems:** Blade pitching and mechanical disc brakes provide robust braking control, ensuring safe operation and quick response to varying wind speeds.
- **Generator:** A doubly-fed asynchronous machine with adjustable speed control enhances energy conversion efficiency while maintaining reliability and safety standards.
- **Yaw System:** Grid-fed drives and disc brakes enable precise yaw control, ensuring the turbine maintains alignment with wind direction for optimal energy capture.
- **Nacelle:** Featuring sound insulation and safety controls, the nacelle provides a secure environment for housing control units and emergency systems.
- **Tower:** With a modular design and corrosion protection, the tower ensures structural integrity and longevity, providing stability for the entire turbine system.

Technical Data	Model No	GE 1.7– 103
	Make of WEG	M/s. GE India Industrial Pvt. Ltd
	Rotor Diameter	103m
	Cut in wind speed	3.5m/s
	Rated Wind speed	12 m/s (approx.)
	Speed	10-20 rpm
	Hub height	80m
Rotor	Number of blades	3
	Rotor shaft tilt angle	4°
	Rotational direction	Clockwise
	Orientation to the tower	Upwind
Gearbox	Type	Planetary Spur combination
	Rated power	1870Kw
	Rated efficiency	N=96.8%
	Rated Power	1700Kw
Generator/ Transformer	Type	Doubly fed asynchronous generator
	Synchronous speed	1500rpm
	Rated speed	1800rpm
	Rated efficiency	96.10%
	Adjusting Speed	0.5/sec

A.5. Parties and project participants >>

Party (Host)	Participants
India	BHORUKA POWER CORPORATION LTD

A.6. Baseline Emissions>>

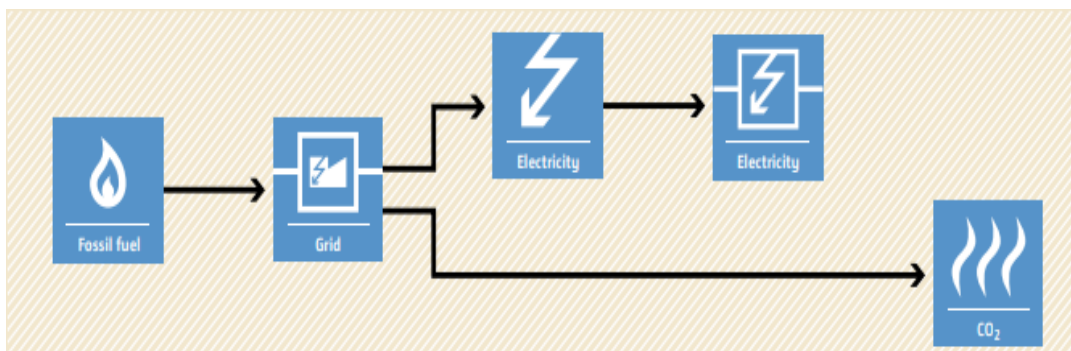
The baseline scenario identified during the PCN stage of the project activity entails the following:

- Grid:

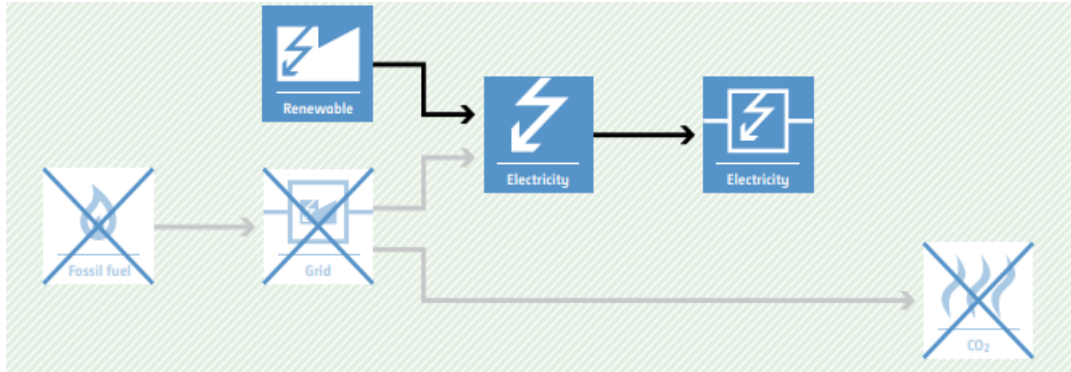
If the project activity had not been implemented, an equivalent amount of electricity would have been generated from fossil fuel-based power plants and supplied to the southern regional grid, which is part of the unified Indian Grid system. This is because the national grid primarily relies on electricity generated from fossil fuel-based power plants. Therefore, the baseline scenario of the project activity corresponds to the grid-based electricity system, which aligns with the pre-project scenario.

Schematic diagram showing the baseline scenario:

Baseline Scenario:



Project Scenario:



A.7. Debundling>>

This project is not a debundled component of a larger registered carbon offset 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"> (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. 	<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"> (a) Integrate BESS with a Greenfield power plant; (b) Integrate a BESS together with implementing a capacity addition to (an) existing solar photovoltaic 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. 	<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"> (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 	<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>

<p>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.</p> <p>(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</p>	
<p>4)In case of hydro power plants, one of the following conditions shall apply:</p> <p>a)The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of reservoirs; or</p> <p>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</p> <p>c)The project activity results in new single or multiple reservoirs and the power density calculate equation (7), is greater than 4 W/m².</p> <p>d)The project activity is an integrated hydro power project involving multiple reservoirs, where the power density of any of the reservoirs, calculated using equation (7), is lower than or equal to 4 W/m², all of the following conditions shall apply.</p> <p>(i)The power density calculated using the total installed capacity of the integrated project, as per equation (8), is greater than 4 W/m²;</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/m² are:</p> <p>a) Lower than or equal to 15 MW; and</p> <p>b) Less than 10 per cent of the total installed capacity of integrated hydro power project.</p>	<p>The proposed project involves the installation of wind power plants/units. Hence, the mentioned criterion is not applicable.</p>
<p>5)In the case of integrated hydro power projects, project proponent shall:</p> <p>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</p> <p>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.</p>	<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> <p>a)Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site;</p> <p>b) Biomass-fired power plants;</p>	<p>The proposed project activity involves installing wind power plants/units. Therefore, the specified criteria are not applicable.</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	The proposed project activity involves installing wind power plants/units. Therefore, the specified criteria are not applicable.
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B.3. Applicability of double counting emission reductions >>

To avoid double counting of emission reductions in the project, the following measures are implemented:

- The project can be distinctly identified through its precise location coordinates.
- It is equipped with a dedicated commissioning certificate and connection point.
- Energy meters specifically assigned to the project developer's consumption point are linked with the project.

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

According to the relevant methodology ACM0002, Version 22.0, the project boundary encompasses both the Wind Turbine Generator (WTG) and all power plants physically connected to the same electricity system as the project power plant.

Source		Gas	Included?	Justification/Explanation
Baseline	CO2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity	CO ₂	Yes	Main Emission Source
		CH ₄	No	Minor Emission Source
		N ₂ O	No	Minor Emission Source
		Other	No	No other GHG emissions were emitted from the project
Project	Greenfield Wind Power Project Activity	CO ₂	No	The Project activity does not emit CO ₂
		CH ₄	No	Project activity does not emit CH ₄
		N ₂ O	No	Project activity does not emit N ₂ O
		Other	No	No other emissions are emitted from the project

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

As per the endorsed consolidated methodology ACM0002, Version 22.0, when the project activity entails the installation of a new grid-connected renewable power plant/unit, the baseline scenario is described as follows: "**The baseline scenario is electricity delivered to the grid 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.**"

Emission reductions are calculated as follows:

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

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 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 in year y can be calculated as follows:

$$BE_y = EG_{PJ,y} \times EF_{Grid,y} \quad (\text{Eq. 2})$$

Where,

BE_y = Baseline emissions in year y (t CO₂)

$EG_{PJ,y}$ = 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)

$EF_{Grid,y}$ = Grid emission factor in year y (t CO₂/MWh)

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 tCO₂/MWh for the years 2013-2020 as a cautious estimate for Indian projects not previously verified under any GHG program. Similarly, for the vintage 2021-22, the combined margin emission factor obtained from the CEA database in India corresponds with the default value. Consequently, the same emission factor is utilized for computing emission reductions.

Regarding project emissions, ACM0002 version 22.0 specifies that only emissions related to fossil fuel combustion, emissions from the operation of geothermal power plants due to the release of non-condensable gases, and emissions from water reservoirs of hydroelectric plants should be taken into account. Since the project involves a wind power project, emissions from renewable energy plants are negligible ($PE_y = 0$). Leakage, as outlined in ACM0002 version 22.0, is considered to be zero as there is no transfer of energy-generating equipment in the project activity ($LE_y = 0$).

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 Emission Reductions (ERy) = 85,629 CoUs/yr (85,629 tCO₂eq/yr)

S.no	Year	Baseline Emissions (tCO ₂ e)	Project Emissions (tCO ₂ e)	Leakage (tCO ₂ e)	Emission Reductions (tCO ₂ e)
1	26-11-2015 to 31-12-2015	9,393	0	0	9,393
2	01-01-2016 to 31-12-2016	95,159	0	0	95,159
3	01-01-2017 to 31-12-2017	95,159	0	0	95,159
4	01-01-2018 to 31-12-2018	95,159	0	0	95,159
5	01-01-2019 to 31-12-2019	95,159	0	0	95,159
6	01-01-2020 to 31-12-2020	95,159	0	0	95,159
7	01-01-2021 to 31-12-2021	95,159	0	0	95,159
8	01-01-2022 to 31-12-2022	95,159	0	0	95,159
9	01-01-2023 to 31-12-2023	95,159	0	0	95,159
	Total Emission Reduction	7,70,665	0	0	7,70,665
	Annual Average ER	85,629	0	0	85,629

B.6. Prior History>>

The project activity has not applied to any other GHG program for generation or issuance of carbon offsets or credits for the said crediting period.

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

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

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

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

B.9. Monitoring period number and duration>>

First Issuance Period: 7 years, 1 month – 26/11/2015 to 31/12/2023

B.8. Monitoring plan>>

USE THE FOLLOWING TABLES FOR PARAMETERS BEING MONITORED OR USED IN EMISSION REDUCTION DETERMINATION

Data/Parameter	<i>EFG</i> Grid.y
Data unit	tCO ₂ /MWh
Description	A "grid emission factor" refers to a CO ₂ emission factor (tCO ₂ /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 ₂ /MWh for the 2013 - 2020 years as a fairly conservative estimate for Indian projects not previously verified under any GHG program. Hence, the same emission factor has been considered to calculate the emission reduction under conservative approach.
Source of data Value(s) applied	UCRCoUStandardAug2022updatedVer6_090822220127104470.pdf (rackcdn.com)
Measurement methods and procedures	-
Monitoring frequency	Ex-ante fixed parameter
Purpose of data	For the calculation of Emission Factor of the grid

Data / Parameter:	EGy, net
Data unit:	MWh
Description:	Net electricity supplied to the NEWNE grid facility by the project activity.
Source of data:	Joint Meter Reading Report
Measurement procedures (if any):	Data Type: Measured Monitoring equipment: Energy Meters are used for monitoring Archiving Policy: Electronic Calibration frequency: Once in 5 years (considered as per provision of CEA India). The net electricity generated by the project activity will be calculated.
Value Applied	1,05,733.20 MWh (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:	Monthly
QA/QC procedures:	Continuous monitoring, hourly measurement monthly recording. Tri-vector (TVM)/ABT energy meters with accuracy class 0.2s.
Any comment:	-