



Monitoring Report

CARBON OFFSET UNIT (CoU) PROJECT



Title: Wind Power Project in Tamil Nadu by Bannari Amman
UCR-172

Version 02
Date 16/08/2022

First COU Issuance Period: 8 years
Date: 01/01/2014 to 31/12/2021



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

Monitoring Report	
Title of the project activity	Wind Power Project in Tamil Nadu by Bannari Amman
UCR project registration code	172
Version	02
Completion date of the MR	16/08/2022
Monitoring period number and duration of this monitoring period	Monitoring Period Number: 01 Duration of this monitoring Period: 01/01/2014 to 31/12/2021, (first and last days included)
Project participants	Green & Clean Sustainability Partners (Authorized Representative of the UCR Project) Bannari Amman Spinning Mills Limited (Project Developer)
Host Party	India
Applied methodologies and standardized baselines	Applied Baseline Methodology: AMS-I. D: “Grid connected renewable electricity generation”, version 16 Standardized Methodology: Not Applicable.
Sectoral scopes	01 Energy industries (Renewable/Non-Renewable Sources)
Estimated amount of GHG emission reductions for this monitoring period in the registered PCN	2014: 14,710 CoUs (14,710 tCO _{2eq}) 2015: 10,697 CoUs (10,697 tCO _{2eq}) 2016: 18,140 CoUs (18,140 tCO _{2eq}) 2017: 16,670 CoUs (16,670 tCO _{2eq}) 2018: 15,956 CoUs (15,956 tCO _{2eq}) 2019: 14,946 CoUs (14,946 tCO _{2eq}) 2020: 13,988 CoUs (13,988 tCO _{2eq}) 2021: 14,691 CoUs (14,691 tCO _{2eq})
Total:	119,798 CoUs (119,798 tCO_{2eq})

SECTION A. Description of project activity

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

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

The project activity has been developed and being operated by “Bannari Amman Spinning Mills Limited” (hereinafter also referred to as project proponent or PP), and represented by **Green & Clean Sustainability Partners** in UCR platform as the authorized representative of PP. The PP is engaged in vertically integrated textile production, especially manufactures cotton yarn, woven and knitted fabrics, finished garments, home textiles. The company was incorporated in the year 1989 and issued shares to the public in the year 2007. With an objective to become a sustainable entity PP has decided to invest on generating green power for its own consumption such that it can replace conventional grid power with renewable electricity. The project activity consists of total 14 Wind Turbine Generators (WTGs) having individual machine capacity of 800 KW; manufactured and supplied by Enercon E-48. The total aggregated installed capacity is 11.2 MW which was commissioned in the Dindigul district in the state of Tamil Nadu, in India.

Thus, the project activity aims to harness kinetic energy of wind (renewable source) to generate electricity. It is capable of generating around 19,622.40 MWh per year, which is estimated based on an average estimated utilization factor of 20% (this has been considered for an ex-ante estimate). The net generated electricity from the project activity has been evacuated to regional grid under a long-term power purchase arrangement with the Tamil Nadu Electricity Board for further utilization for captive purpose under a wheeling arrangement. The first machine under the project activity was commissioned on 17 Jan 2006 and last machine under the project activity was commissioned on 08 Mar 2006. The expected operational lifetime of the project is 20 years.

The project activity has achieved total GHG emission reduction of 119,798 tCO₂e for overall period of 8 years starting from 01/01/2014 to 31/12/2021 (both days included) during this first monitoring and verification cycle under UCR. Since the project activity generates electricity through wind energy, a clean renewable energy source it will not cause any negative impact on the environment and thereby contributes to climate change mitigation efforts. There is no double accounting of emission reduction claim.

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

The project activity employs state-of-art horizontal axis wind turbines. The WTGs comprising the project activity generates clean power which is then exported to the nearest receiving station of Tamil Nadu Electricity Board at Erode. The WTGs are grid connected and houses the metering, switchgear and other protection equipment. Representation of the same is provided below.

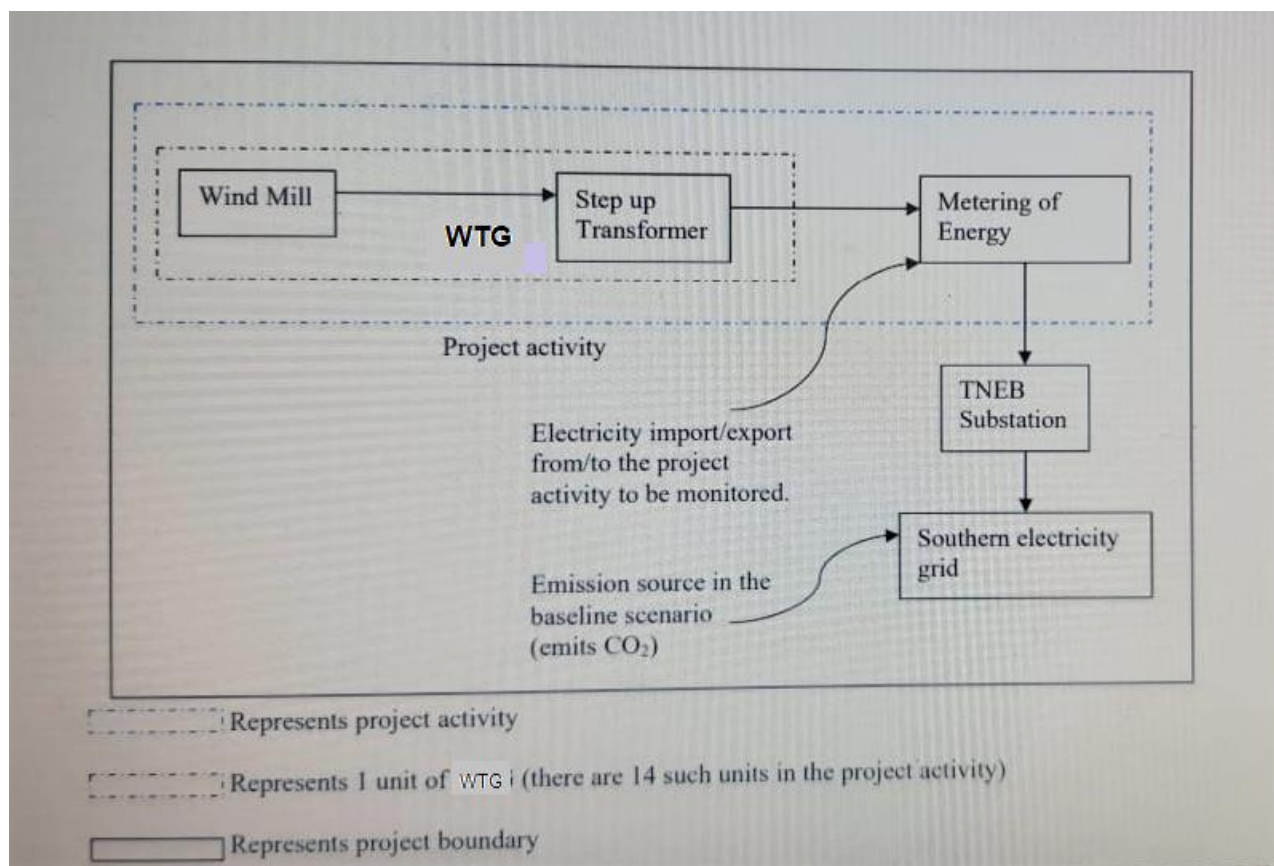
Describe in detail

The machine details are given below:

Specification	Value
Rated power	800 KW
Rotor Diameter	48m
Gearbox Type	Gear less
Generator Type	Synchronous generator
Tower	74 m concrete
Turbine Type	Gearless horizontal axis wind turbine with variable rotor speed
Braking	Aerodynamic
Blade Material	Glass Fibre reinforced Epoxy
Yaw System	Active yawing with 4 electric yaw drives with brake motor and friction bearing

Technical details:

Single Line Diagram of the project:



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

UCR Project ID or Date of Authorization: 172
Start Date of Crediting Period: 01/01/2014
Project Commissioned: 17/01/2006 to 08/03/2006
UCR Monitoring Period: 01/01/2014 to 31/12/2021

Project is in continuous operation since its dates of commissioning.
The records of standard scheduled maintenance shut down period etc. submitted to Verifier.

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	01/01/2014
Carbon credits claimed up to	31/12/2021
Total ERs generated (tCO _{2eq})	119,798 (i.e. CoUs)
Project Emissions	0
Leakage	0

e) Baseline Scenario>>

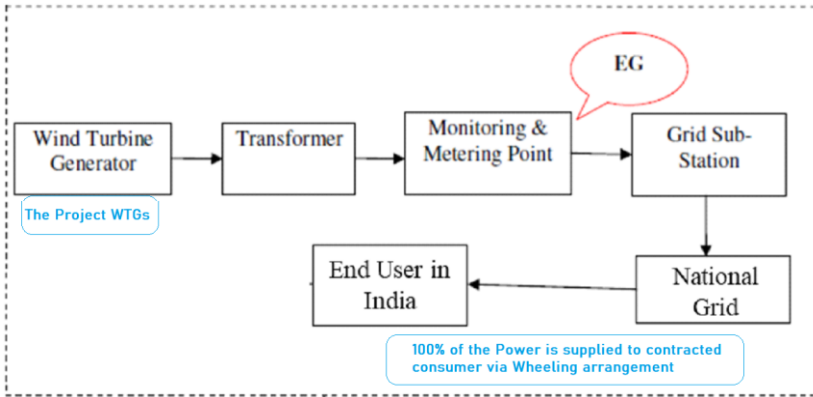
The baseline scenario identified at the PCN stage of the project activity is:

- Grid

In the absence of the project activity, the equivalent amount of electricity would have been generated from fossil fuel-based power plants and exported to the southern regional grid (which is connected to the unified Indian Grid system) as national grid is predominantly sourcing from fossil fuel-based power plants. Hence, baseline scenario of the project activity is the grid-based electricity system, which is also the pre-project scenario.

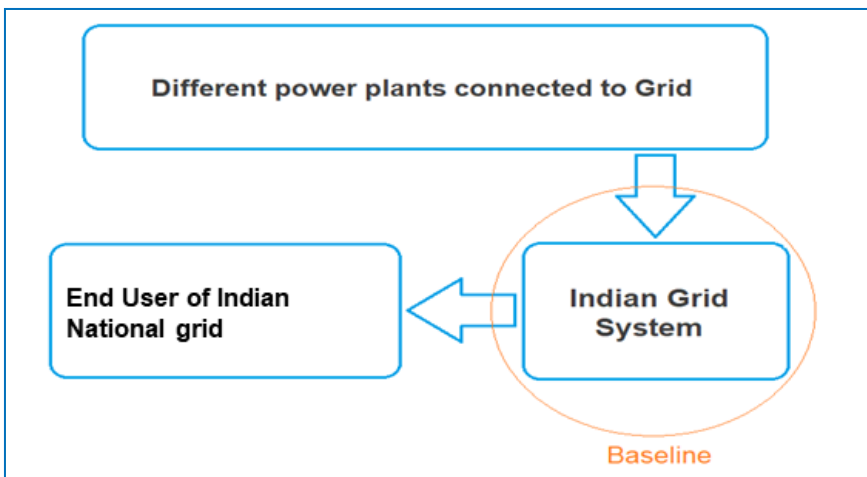
Schematic diagram showing the baseline scenario:

Project Scenario:



Technical layout of the project is given below:

Baseline Scenario:



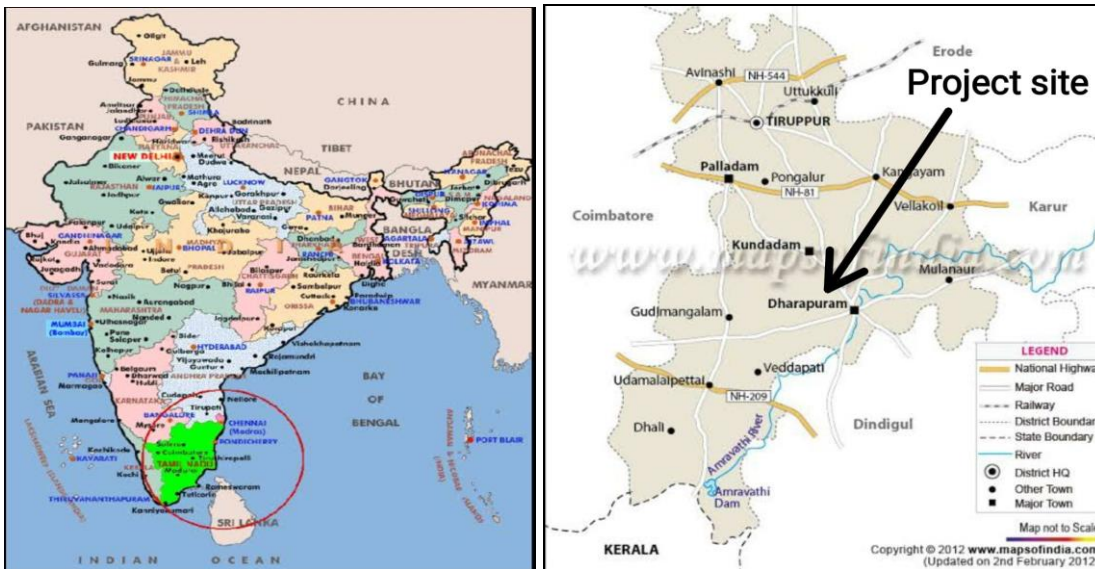
A.2. Location of project activity>>>

The project is located across villages in Chinnaputhur, Govindapuram, Gathelrev, Molarpatti of Dharapuram Taluka, in Erode District of Tamil Nadu state in India.

The nearest railway station is located at Palani which is 30 kms away from the site and nearest airport is located at Coimbatore 80 kms away from the project site.

- Country : India
- States : Tamil Nadu
- District: Erode
- Village: Chinnaputhur

The representative location map is included below:



(Image courtesy: Google maps & images)

The latitude and longitude of the project activity are given below:

Unique Identification Number	HT SC Number	Latitude	Longitude
BASMLDH-01	1067	N 10°44'11.96"	E77°25'2.73"
BASMLDH-02	1068	N 10°44'19.64"	E 77°24'57.79"
BASMLDH-03	1069	N 10°44'33.46"	E 77°24'54.42"
BASMLDH-09	1070	N 10°44'50.65"	E 77°24'35.47"
BASMLDH-10	1070	N 10°45'3.08"	E 77°24'35.14"
BASMLDH-11	1071	N 10°45'13.14"	E 77°24'30.85"
BASMLDH-13	1072	N 10°44'50.84"	E 77°24'19.45"
BASMLDH-14	1072	N 10°44'57.94"	E 77°24'15.10"
BASMLDH-12	1073	N 10°45'21.51"	E 77°24'20.58"
BASMLDH-04	1077	N 10°44'42.34"	E 77°25'2.58"
BASMLDH-08	1077	N 10°44'49.72"	E 77°24'58.89"
BASMLDH-07	1086	N 10°45'2.42"	E77°24'53.92"
BASMLDH-05	1106	N 10°44'42.99"	E 77°25'15.38"
BASMLDH-06	1106	N 10°44'50.68"	E 77°25'10.05"

A.3. Parties and project participants >>

Party (Host)	Participants
India	<p>1) <u>Project Representative in UCR:</u></p> <p>Green & Clean Sustainability Partners (also referred to as GNCS)</p> <p>Focal Point of Contact: Rucha Natu Partner</p> <p>Contact details: gncsustain@gmail.com +91 9713740395</p> <p>Address: 267/ Sahjeevan Nagar Near Gopur Square, Indore, Madhya Pradesh – 452 009. India.</p> <p>[GNCS has been authorized by the Project Proponent as authorized representative for UCR and to take care of the entire process to be followed under UCR including CoUs issuance and transactions.]</p> <p>2) <u>Project Proponent (PP):</u></p> <p>Bannari Amman Spinning Mills Limited.</p> <p>Contact details: S.V. Arumugam www.bannari.com</p> <p>Address: 252, Mettupalayam Road, Building: Registered Office, Coimbatore – 641 043, Tamil Nādu, India.</p>

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

SECTORAL SCOPE:

01, Energy industries (Renewable/Non-renewable sources)

TYPE:

I - Renewable Energy Projects

CATEGORY:

AMS. I.D. (Title: “Grid connected renewable electricity generation”, version 16)

Note: Current applicable version of the methodology is 18; however, as the project is already a registered CDM project (4877) with methodology version 16, hence the same version is applied under UCR PCN.

Applicability of methodologies and standardized baselines >>
The scale of the activity is under the project Type-I and the project activity remained under the limit of 15 MW every year during the crediting period. Therefore, the GHG emission reductions that are claimed remains within the limit of its type as per the applied methodologies.

A.5. Crediting period of project activity >>

Length of the crediting period corresponding to this monitoring period: 08 years.

Date: 01/01/2014 to 31/12/2021 (inclusive of both dates).

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

The details of the authorized representative of PP are submitted below:

Particulars	Details
Name	Rucha Natu
Company	Green & Clean Sustainability Partners.
Address	Address: 267/ Sahjeevan Nagar Near Gopur Square, Indore, Madhya Pradesh – 452 009. India
E-mail	gncsustain@gmail.com
Contact	+91 9713740395

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>>

a) Description of the installed Technologies, technical processes and equipment:

(Technical information given on **Section – A.1.(b)**)

b) Information on the implementation and the actual operation of the project activity, including relevant dates:

Sl. No.	Location	Commissioning Date (COD)
1)	BASMLDH-01	17-Jan-06
2)	BASMLDH-02	17-Jan-06
3)	BASMLDH-03	17-Jan-06
4)	BASMLDH-09 BASMLDH-10	17-Jan-06
5)	BASMLDH-11	17-Jan-06
6)	BASMLDH-13 BASMLDH-14	17-Jan-06
7)	BASMLDH-12	17-Jan-06
8)	BASMLDH-04 BASMLDH-08	01-Feb-06
9)	BASMLDH-07	08-Feb-06
10)	BASMLDH-05 BASMLDH-06	08-Mar-06

B) For the description of the installed technology(is), technical process and equipment, include diagrams, where appropriate>>

Technical details:

The technical layout of the Wind Turbine is shown below:

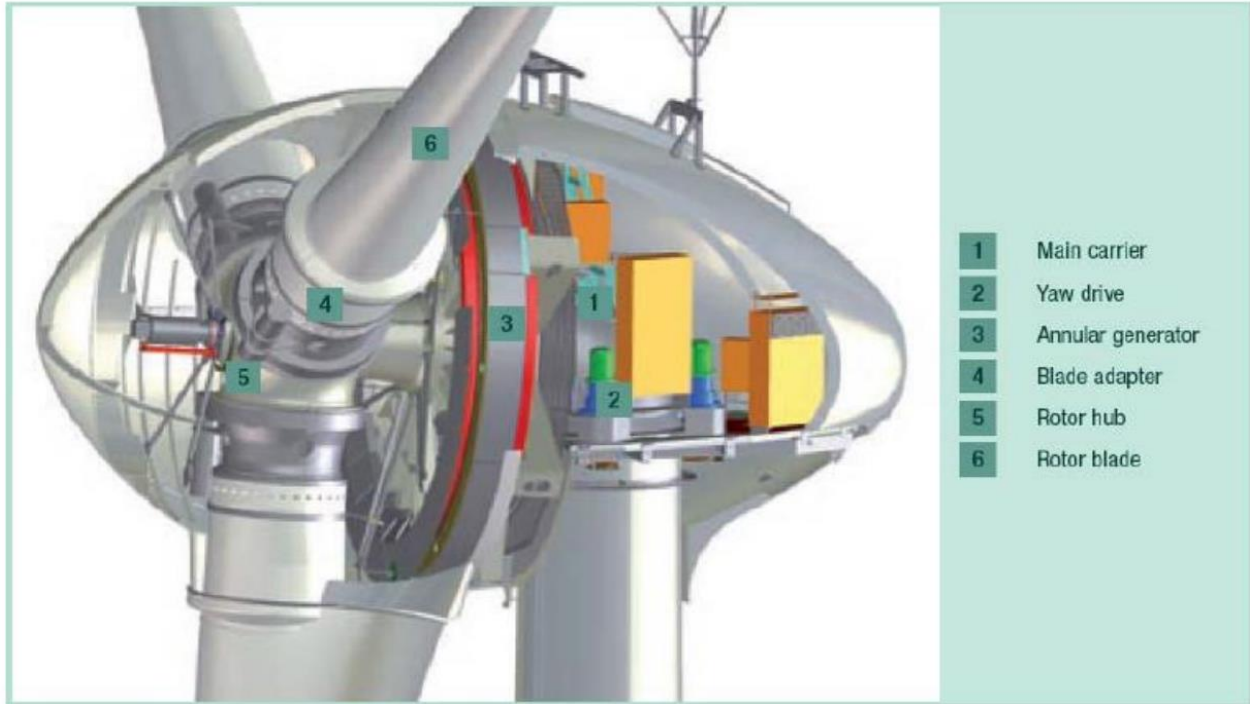


Figure: Enercon make E-48 Diagram.

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

There was no harm identified from the project and hence no mitigations measures are applicable.

Rational: as per ‘Central Pollution Control Board (Ministry of Environment & Forests, Govt. of India)’, final document on revised classification of Industrial Sectors under Red, Orange, Green and White Categories (07/03/2016), it has been declared that solar project activity falls under the “White category”. White Category projects/industries do not require any Environmental Clearance such as ‘Consent to Operate’ from PCB as such project does not lead to any negative environmental impacts. Additionally, as per Indian Regulation, Environmental and Social Impact Assessment is not required for Wind Projects.

The project activity has identified grid power as the baseline. Indian grid system has been predominantly dependent on power from fossil fuel powered plants. The renewable power generation is gradually contributing to the share of clean & green power in the grid; however, grid emission factor is still on higher side which defines grid as distinct baseline.

Additionally, the Government of India has stipulated following indicators for sustainable development in the interim approval guidelines for such projects which are contributing to GHG mitigations. The Ministry of Environment, Forests & Climate Change, has stipulated economic, social, environment and technological well-being as the four indicators of sustainable development. It has been envisaged that the project has been contributing to sustainable development using the following ways (as defined under the registered UCR-PCN):





- Job creation
- Local infrastructure development
- General awareness on overall technology access and social
- Overall Demographic impacts
- Community engagement via local programs etc.



- Better financial conditions due to job creation
- Better flow of finance into the region due to overall infrastructure and demographic impacts
- Access to businesses opportunities for local vendors, local contractors, etc.



- Deployment of Clean Technology.
- Contribution to Green power into the grid mix
- Contribution to national energy security that involves clean technology as example setting into the sector
- Due to consumption of green power as captive energy it adds value to the PP's business practices leading to sustainability



- Zero impact on air pollution due to no fossil fuel involvement
- Zero discharge on ground due to no water usages, hence no negative impact on soil
- Zero impact on any water bodies due to no release of solid and/or liquid wastes from the project
- Significant contribution to greenhouse gas reduction considering the fossil based grid power as the baseline

However, this is to be noted that under the UCR verification no such claim related to Sustainable Development related contributions has been considered by the Project Proponent. This is because even though such developmental attributes are visible and impacts are experienced by the beneficiaries, but currently no specific monitoring & impact measurement mechanism has been adopted by PP. Hence, detailing of these SD contributions and their quantification and verification have been excluded.

B.3. Baseline Emissions>>

This section provides details of emission displacement rates/coefficients/factors established by the applicable methodology selected for the project.

As per para 19 of the approved consolidated methodology AMS-I.D. Version 16, 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 wind power plant to harness the green power from wind energy and to use for sale to national grid through PPA arrangement. In the absence of the project activity, the equivalent amount of power would have been generated by the operation of grid-connected fossil fuel-based power plants and by the addition of new fossil fuel-based generation sources into the grid. 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.

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 2014- 2020 years as a fairly conservative estimate for Indian projects not previously verified under any GHG program. Also, for the vintage 2021-22, the combined margin emission factor calculated from CEA database in India results into higher emission than the default value. Hence, the same emission factor has been considered to calculate the emission reduction under conservative approach.

B.4. Debundling>>

This project activity is not a debundled component of a larger 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:

AMS. I.D. (Title: “Grid connected renewable electricity generation”, version 16)

Note: Current applicable version of the methodology is 18; however, as the project is already a registered CDM project (4877) with methodology version 16, hence the same version is applied under UCR PCN.

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

The project activity involves generation of grid connected electricity from the operation of a new wind power project. The project activity has installed capacity of 11.2 MW which will qualify for a small-scale project activity under Type-I of the Small-Scale methodology. The project status is corresponding to the methodology AMS-I.D., version 16 and applicability of methodology is discussed below:

Applicability Criterion	Project Case
1. This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass: (a) Supplying electricity to a national or a regional grid; or (b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.	The project activity involves setting up of a renewable energy (wind) generation plant that exports electricity Indian electricity grid system for further utilization at a dedicated facility. Thus, the project activity meets this applicability condition (b).
2. Illustration of respective situations under which each of the methodology (i.e., AMS-I. D: Grid connected renewable electricity generation”, AMS-I. F: Renewable electricity generation for captive use and mini-grid” and AMS-I. A: Electricity generation by the user) applies is included in Table 2	According to the point 1 of the Table 2 in the methodology – “Project supplies electricity to a national/ regional grid” is applicable under AMS I.D. As the project activity supplies the electricity to the regional grid which is a regional grid, the methodology AMS-I.D. is applicable.
3. This methodology is applicable to project activities that: (a) Install a Greenfield plant; (b) Involve a capacity addition in (an) existing	The Project activity involves the installation of new power plant at a site where there was no renewable energy power plant operating prior to the

Applicability Criterion	Project Case
plant(s); (c) Involve a retrofit of (an) existing plant(s); (d) Involve a rehabilitation of (an) existing plant(s); or (e) Involve a replacement of (an) existing plant(s).	implementation of the project activity. Thus, Project activity is a Greenfield plant and satisfies this applicability condition (a).
4. Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: (a) The project activity is implemented in existing reservoir, with no change in the volume of the reservoir; or (b) The project activity is implemented in existing reservoir, where the volume of the reservoir(s) is increased and the power density as per definitions given in the project emissions section, is greater than 4 W/m ² . (c) 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/m ²	As the project activity is a wind power plant, these criteria are not applicable.
5. If the new unit has both renewable and non-renewable components (e.g., a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	The rated capacity of the project activity is 11.2 MW with no provision of Co-firing fossil fuel. Hence, not applicable.
6. Combined heat and power (co-generation) systems are not eligible under this category	This is not relevant to the project activity as the project involves only wind power generating units.
7. In the case of project activities that involve the capacity addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	There is no other existing renewable energy power generation facility at the project site. Therefore, this criterion is not applicable.
8. In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement power plant/unit shall not exceed the limit of 15 MW.	The project activity is a new installation, it does not involve any retrofit measures nor any replacement and hence is not applicable for the project activity.
9. In the case of landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered methane emissions are eligible under a relevant Type III category. If the recovered methane is used for electricity generation for supply to a grid, then	This is not relevant to the project activity as the project involves only wind power generating units.

Applicability Criterion	Project Case
the baseline for the electricity component shall be in accordance with procedure prescribed under this methodology. If the recovered methane is used for heat generation or cogeneration other applicable Type-I methodologies such as “AMS I. C.: Thermal energy production with or without electricity” shall be explored.	
10. In case biomass is sourced from dedicated plantations, the applicability criteria in the tool “Project emissions from cultivation of biomass” shall apply.	This is not relevant to the project activity as the project involves only wind power generating units.

C.3 Applicability of double counting emission reductions >>

There is no double accounting of emission reductions in the project activity due to the following reasons:

- Project is uniquely identifiable based on its location coordinates,
- Project has dedicated commissioning certificate and connection point,
- Project is associated with energy meters which are dedicated to the generation/feeding point with the grid.
- The project crediting under Clean Development Mechanism (CDM) can be transparently tracked from the UNFCCC website and hence it can be verified whether the double accounting is avoided or not.

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

As per applicable methodology AMS-I.D. Version 16, “*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.*”

Thus, the project boundary includes the Wind Turbine Generators (WTGs) and the Indian grid system.

Source		Gas	Included?	Justification/Explanation
Baseline	Grid connected fossil fuel-based electricity generation	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	No CO ₂ emissions are emitted from the project
		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

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

Net GHG Emission Reductions and Removals

$$\text{Thus, } ER_y = BE_y - PE_y - LE_y$$

Where:

ER_y = Emission reductions in year y (tCO₂/y)

BE_y = Baseline Emissions in year y (t CO₂/y)

PE_y = Project emissions in year y (tCO₂/y)

LE_y = Leakage emissions in year y (tCO₂/y)

Baseline Emissions

Baseline emissions include only CO₂ emissions from electricity generation in power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants.

The baseline emissions are to be calculated as follows:

$$BE_y = EG_{BL,y} \times EF_{grid,y}$$

Where:

BE_y	=	Baseline emissions in year y (t CO ₂)
$EG_{BL,y}$	=	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the UCR project activity in year y (MWh)
$EF_{grid,y}$	=	UCR recommended emission factor of 0.9 tCO ₂ /MWh has been considered. (Reference: General Project Eligibility Criteria and Guidance, UCR Standard, page 4)

Project Emissions

As per AMS-I. D, version 16, only emission associated with the fossil fuel combustion, emission from operation of geo-thermal power plants due to release of non-condensable gases, emission from water reservoir of wind should be accounted for the project emission. Since the project activity is a wind power project, project emission for renewable energy plant is nil.

Thus, $PE_y = 0$.

Leakage

As per paragraph 22 of AMS-I.D. version-16, 'If the energy generating equipment is transferred from another activity, leakage is to be considered.' In the project activity, there is no transfer of energy generating equipment and therefore the leakage from the project activity is considered as zero.

Hence, $LE_y = 0$

The actual emission reductions achieved during the first CoU period (01/01/2014 to 31/12/2021) are estimated as follows:

$$\begin{aligned} BE_{y,\text{total}} &= 133,114.61 \text{ MWh} \times 0.9 \text{ tCO}_2\text{e/MWh} \\ &= 119,803.149 \text{ tCO}_2\text{e} \end{aligned}$$

The final value considered for reporting and claim = 119,798 tCO₂e

(This value is the sum of rounded down values calculated for each vintage year, hence the most conservative)

Also, the annualized average value of emission reductions achieved by the project activity for this current monitoring period has been calculated and reported as follows:

$$BE_{y,\text{avg}} = 14,975 \text{ tCO}_2\text{e}$$

Thus, the final ER value is represented as per the methodology as follows:

$$\begin{aligned} ER_y &= BE_y - PE_y - LE_y \\ &= 119,798 - 0 - 0 \\ &= 119,798 \text{ tCO}_2\text{e} \end{aligned}$$

Rational: This final value is conservative as all annualized ER values are rounded down and final sum is considered for reporting, which gives the most conservative result.

The vintage wise break up is given under the ER excel sheet and also included under the Appendix 3 of this report.

C.6. Prior History>>

The project is registered under Clean Development Mechanism (CDM) of UNFCCC with 10 years of crediting period (Reference No: 4877). Crediting period of the project under CDM starts on 01/08/2011 and ends on 31/07/2021. The project has already claimed carbon credits under CDM and also under VCS mechanism till 30/06/2012.

In continuation with the same, the project can claim credits from 01/07/2012. However, as per UCR guidelines, the earliest crediting can be considered from 01/01/2014, hence the first monitoring period considered under UCR is from 01/01/2014.

C.7. Monitoring period number and duration>>

Number : First Monitoring Period
Duration : 8 years .
01/01/2014 to 31/12/2021 (inclusive of both dates)¹

¹ The first COU Issuance Period considered under the Registered UCR PCN is 01/01/2014 to 31/05/2022. However, the footnote reference #1 of the PCN provides the provision change during the first issuance as may be required. Therefore, during this current (1st) verification the monitoring period has been restricted to 31/12/2021 which is within the prescribed range of dates for the first issuance submitted under the PCN.

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

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

However, overall monitoring period of the current verification is lesser than the total period prescribed in the PCN.

Please refer to the footnote reference #1 for more details.

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

Not applicable.

C.10. Monitoring plan>>

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

Data / Parameter	UCR recommended emission factor
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 2014- 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	https://a23e347601d72166dcd6-16da518ed3035d35cf0439f1cdf449c9.ssl.cf2.rackcdn.com/Documents/UCRStandardNov2021updatedVer2_301121081557551620.pdf
Value applied	0.9
Measurement methods and procedures	-
Monitoring frequency	Ex-ante fixed parameter
Purpose of Data	For the calculation of Emission Factor of the grid
Additional Comment	The combined margin emission factor as per CEA database (current version 17, Year 2022) results into higher emission factor. Hence for 2021-22 vintage UCR default emission factor remains conservative.

Data and Parameters to be monitored (ex-post monitoring values):

Data / Parameter	EG _{BL, y}
Data unit	MWh

Description	Net electricity supplied to the grid by the project activity (considered for the entire monitoring period)
Source of data	Tamil Nadu Electricity Board records
Measurement procedures (if any):	<p>PP has considered the option (i) of the registered PCN prescribed for this particular parameter, which means:</p> <p><i>“The JMR/Credit notes etc. generated for the project WTGs provide net export quantity, the same will be directly considered for calculation”.</i></p> <p>Thus, $EG_{BL, y}$ is the net export which are directly sourced from the monthly generation statements (such as JMR). Details can be referred in the ER sheet.</p>
Measurement Frequency:	Monthly
Value applied:	133,114.61
QA/QC procedures applied:	<p>Calibration of the Tamil Nadu Electricity Board Main meters will be carried out once in five years as per National Standards (as per the provision of CEA, India.</p> <p>The energy meter details are attached in Appendix-2 for further reference.</p>
Purpose of data:	The Data/Parameter is required to calculate the baseline emission.
Any comment:	All the data will be archived till a period of two years from the end of the crediting period.

Appendix 1:

Technical specification of the wind machine included under this project:

Power		
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):		III
Wind class (IEC):		IIa
Rotor		
Diameter:		48.0 m
Swept area:		1,809.6 m ²
Number of blades:		3
Rotor speed, max:		31.0 U/min
Tip speed:		78 m/s
Type:		AERO E-48
Material:		GFK
Manufacturer:		Enercon
Power density 1:		442.1 W/m ²
Power density 2:		2.3 m ² /kW
Gear box		
Type:		Without. Direct drive
Generator		
Type:		Synchronous
Number:		1.0
Speed, max:		31.0 U/min
Voltage:		690.0 V
Grid connection:		IGBT
Grid frequency:		50.0 Hz
Manufacturer:		Enercon
Tower		
Hub height:		50/55/60/65/76 m
Type:		Steel tube/ Hybrid
Shape:		conical
Corrosion protection:		painted
Manufacturer:		Enercon

Appendix 2:

List of energy meters and their basic details:

SL. NO.	HTSC NO.	METER SL. NO.	MAKE	ACCURACY CLASS
1	1067	HT2160906	EDMI	0.2s
2	1068	HT2160763	EDMI	0.2s
3	1069	HT2160764	EDMI	0.2s
4	1070	HT2160675	EDMI	0.2s
5	1071	HT2160676	EDMI	0.2s
6	1072	HT2160677	EDMI	0.2s
7	1073	17067951	L&T	0.2s
8	1077	17067952	L&T	0.2s
9	1086	17067949	L&T	0.2s
10	1106	17068074	L&T	0.2s

The main meter is tested and calibrated by the TNEB at the time of commissioning of WTG. This is a sealed meter and is controlled by TNEB. Every month, reading of the main meter of each WTG HTSC connection taken by TNEB personnel in presence of O&M personnel (representative of PP).

Validity of Meter Test/Calibration:

METER SL. NO.	Previous Validity	Recent Testing Reference	Current validity
HT2160906	Yes within the 5 year period	31 Jan 2017	Upto 30 Jan 2022
HT2160763	Yes within the 5 year period	28 Feb 2017	Upto 27 Feb 2022
HT2160764	Yes within the 5 year period	28 Feb 2017	Upto 27 Feb 2022
HT2160675	Yes within the 5 year period	28 Feb 2017	Upto 27 Feb 2022
HT2160676	Yes within the 5 year period	28 Feb 2017	Upto 27 Feb 2022
HT2160677	Yes within the 5 year period	28 Feb 2017	Upto 27 Feb 2022
17067951	Yes within the 5 year period	10 May 2017	Upto 9 May 2022
17067952	Yes within the 5 year period	10 May 2017	Upto 9 May 2022
17067949	Yes within the 5 year period	10 May 2017	Upto 9 May 2022
17068074	Yes within the 5 year period	13 May 2017	Upto 12 May 2022

Appendix 3:

Final summary of CoUs claim under this monitoring period:

Year	Net MWH	Net CoU	Final CoUs considered
2014	16,344.70	14,710.23	14,710
2015	11,886.47	10,697.82	10,697
2016	20,156.21	18,140.59	18,140
2017	18,522.69	16,670.42	16,670
2018	17,729.64	15,956.67	15,956
2019	16,607.40	14,946.66	14,946
2020	15,543.32	13,988.99	13,988
2021	16,324.18	14,691.76	14,691
Total =	1,33,114.61	1,19,803	1,19,798²
Annual avg. =	16,639.33	14,975.39	14,975

Comparison with Ex-ante estimate		
Ex-ante estimated annual avg. value as per UCR PCN	17,660	CoUs/year
Actual value of annualized average during the current MP	14,975	CoUs/year
Variation in CoUs =	-15.20%	Fraction

² Here the final value is considered as sum of the yearly values which are rounded down; hence the value is the most conservative.