Monitoring Report

CARBON OFFSET UNIT (CoU) PROJECT

Title: 1.5 MW Wind Project by Shri M. Prabhakara Rao, in Tamil Nadu

Version 2.0
Date 05/08/2022

First COU Issuance Period:
8 years, 04 months

Date:
01/01/2014 to 30/04/2022

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

Monitoring Report	
Title of the project activity	1.5 MW Wind Project by Shri M. Prabhakara Rao, in Tamil Nadu.
UCR project registration code	162
Version	2.0
Completion date of the MR	05/08/2022
Monitoring period number and duration of this monitoring period	Monitoring Period Number: 01 Duration of this monitoring Period: (first and last days included) 01/01/2014 to 30/04/2022
Project participants	Project Proponent: M. Prabhakara Rao Authorized Representative: NSL Renewable Power Private Limited
Host Party	India
Applied methodologies and standardized baselines	Applied Baseline Methodology: AMS-I.D : "Grid connected renewable electricity generation", version 18 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: 1,786 CoUs (1,786 tCO_{2eq})
	2015: 1,057 CoUs (1,057 tCO_{2eq})
	2016: 1,935 CoUs (1,935 tCO_{2eq})
	2017: 2,266 CoUs (2,266 tCO_{2eq})
	2018: 1,751 CoUs (1,751 tCO_{2eq})
	2019: 1,734 CoUs (1,734 tCO_{2eq})
	2020: 1,707 CoUs (1,707 tCO_{2eq})
	2021: 1,753 CoUs (1,753 tCO_{2eq})
	2022: 307 CoUs (307 tCO_{2eq})
Total:	**14,296 CoUs (14,296 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 is promoted by "M. PRABHAKARA RAO" (an Independent Promoter); hereinafter called as project proponent or PP, who is the Chairman and Managing Director of the NSL Group that engages in manufacturing of hybrid seeds and the power division is completely focusing on developing green power projects. With a view of being in line with sustainable development priorities of India, PP has promoted this project as a green power project through tapping of wind energy available in the existing barren land available in the state of Tamil Nadu. The project activity is installation and operation of total 2 Wind Turbine Generators (WTGs) having different individual capacities of 750 KW; manufactured and supplied by NEG Mecon. The total aggregated installed capacity is 1.5 MW in village Panagudi, Tirunelveli district in the state of Tamil Nadu (India).

The project activity harnesses kinetic energy of wind (renewable source) to generate green electricity. It is capable of generating around 2,628 MWh per year, which is estimated based on operation with around 20% utilization factor with efficient utilization of the available wind energy through adoption of an efficient and modern technology. The net generated electricity from the project activity has been evacuated to regional grid under a long-term power wheeling agreement with the Tamil Nadu Electricity Board, for captive consumption by an open access consumer **'Axles India Ltd'**.

The project activity has achieved total GHG emission reduction of 14,296 tCO2e for overall period of 8 years and 4 months, starting from 01/01/2014 to 30/04/2022 (both days included) during this first monitoring and verification cycle. 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.

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 Tirunelveli for further wheeling to the dedicated consumers. The WTGs are grid connected and houses the metering, switchgear and other protection equipment. Representation of the same is provided below.

The machine details are given below:

Specification	Value
Rated power	750 KW
Rotor Type	LM 23.5/AL 23
Gearbox Type	spur/planetary
Generator Type	Asynchronous
Tower Type	Steel tube

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

UCR Project ID or Date of Authorization: 162
Start Date of Crediting Period: 01/01/2014
Project Commissioned: 30/03/2003
Monitoring Period: 01/01/2014 to 30/04/2022 (current)

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	30/04/2022
Total ERs generated (tCO_{2eq})	14,296 (tCO_{2eq})
Leakage	0

e) Baseline Scenario>>

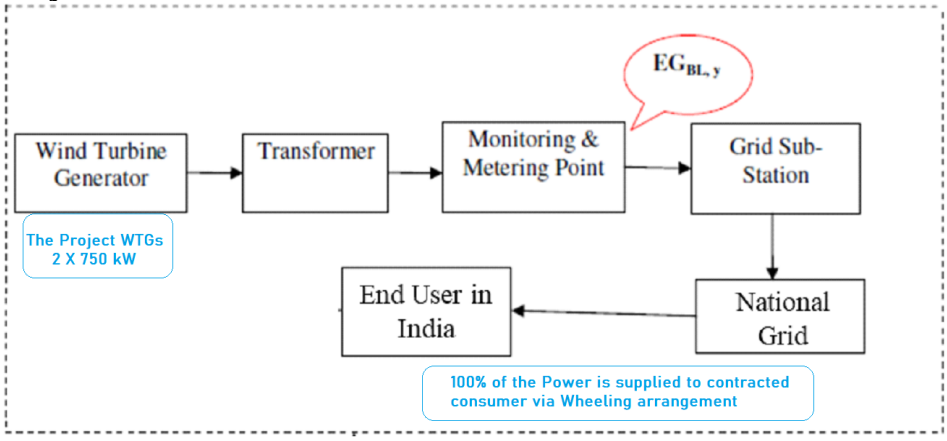
The baseline scenario identified at the PCN stage of the project activity is:

- Grid

In the absence of the project activity, the equivalent amount of electricity would have been generated from fossil fuel-based power plants to be added into the southern regional grid (which is connected to the unified Indian Grid system) and further to be supplied to the captive consumers. The national grid is predominantly sourcing power 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.

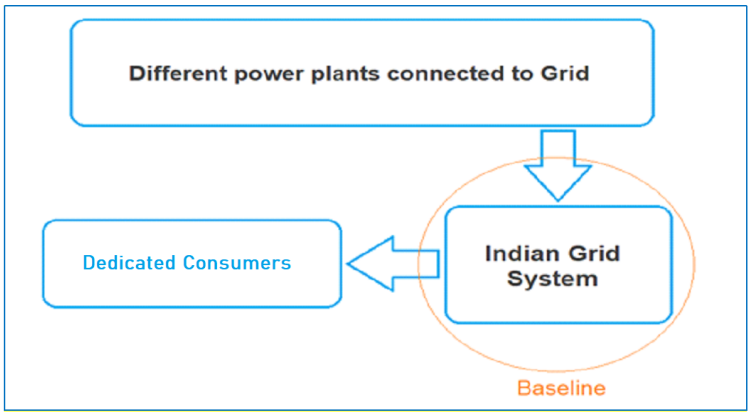
Schematic diagram showing the baseline scenario:

Project Scenario:



(* here $EG_{BL,y}$ refers to the net electricity to be considered for emission calculation, which is referred to as the $EG_{PJ,y}$ under this project activity)

Baseline Scenario:

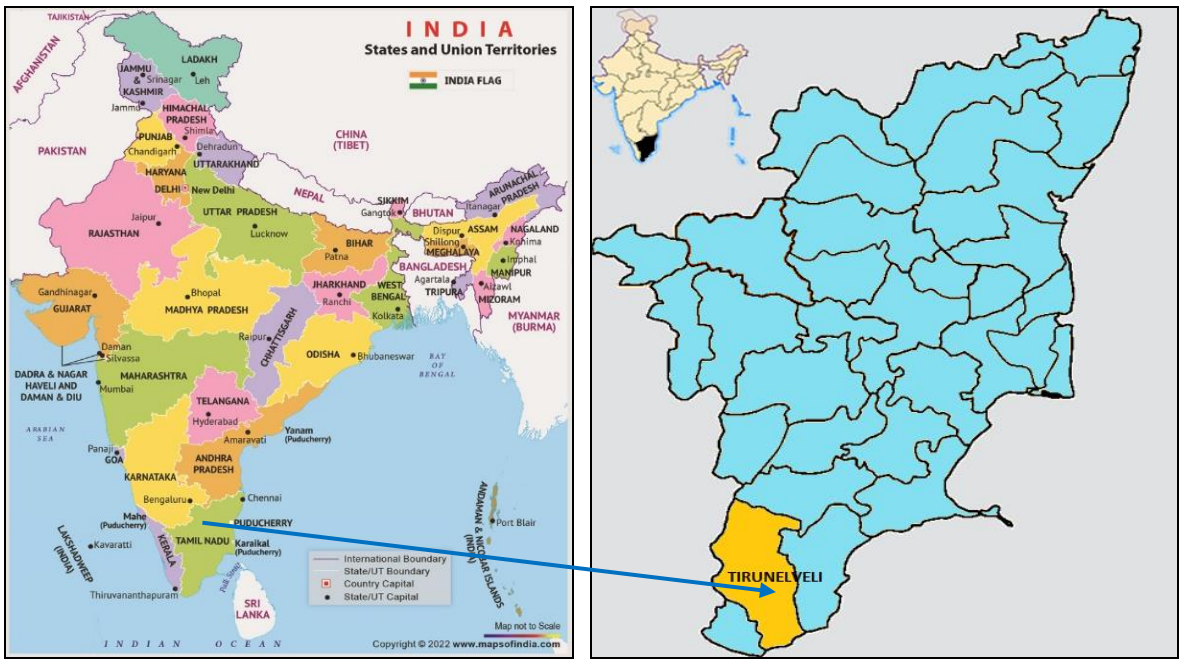


A.2. Location of project activity>>

The project sites are located at in village Panagudi, Tirunelveli district in the state of Tamil Nadu (India). Tirunelveli is approximately 624.3 km from Chennai, capital of Tamil Nadu. The site has been identified as ideally suited for wind power generation based on the micro siting studies and data analysis based on annual wind speed and frequency distribution, carried out by eminent agencies like Indian Institute of Tropical Meteorology and Tamil Nadu Renewable Energy Development Limited

Country : India
States : Tamil Nadu
District: Tirunelveli
Village: Panagudi

The representative location map is included below:



(Courtesy: google map and images)
More details about the project location and related references are included under the Appendix 1.

A.3. Parties and project participants >>

Party (Host)	Participants
India	**Project Proponent:** M. PRABHAKARA RAO **Authorized Representative:** **NSL Renewable Power Private Limited** Contact person: Mr. A Rajnikant Contact: rajnikant.a@nslpower.com Address: C/o NSL, 8 - 2-684/2/A, 4th Floor, Road.No.12, Banjara Hills, Hyderabad - 500034, Telangana, India.

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 18)

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 1.5 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, 4 months.
Date: 01/01/2014 to 30/04/2022 (inclusive of both dates).

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

Particulars	Details
Name	Mr. Rajnikant. A
Project Proponent:	M. PRABHAKARA RAO
Company	**NSL Renewable Power Private Limited. (Authorized Representative)**
Address	C/o NSL, 8 - 2-684/2/A, 4th Floor, Road.No.12, Banjara Hills, Hyderabad – 500 034, Telangana, India.
E-mail	rajnikant.a@nslpower.com
Contact	+91 9581412675

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:

Ref: (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	WTG HT SC NO.	Commissioning Date (COD)
1)	AXLES - 1	534	30/3/2003
2)	AXLES - 2	535	

Project activity has been in continuous operation since the date of commissioning of the machines. Also, the project cycle with UCR as follows:

S N	UCR activity	UCR Date
1	UCR PCN (version 01)	23/05/2022
2	UCR Registration/Approval	13/06/2022
3	UCR Monitoring Report (version 01)	07/06/2022
4	UCR Verification, appointment of verifier	04/08/2022

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



Technical details are submitted under the Appendix 1.

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

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

1. **Social benefits:**

A primary benefit of wind energy is pollution reduction. If wind displaces fossil-fuelled generators, it reduces net grid emissions; which is the case of the project activity. Emission reductions are typically stated as tons of emissions avoided per MWh of electricity produced by wind. These benefits can be monetized to make the project sustainable.

Wind energy doesn't pollute the air like power plants that rely on combustion of fossil fuels, such as coal or natural gas, which emit particulate matter, nitrogen oxides, and sulphur dioxide—causing human health problems and economic damages. Wind turbines don't produce atmospheric emissions that cause acid rain, smog, or greenhouse gases.

The project generates both direct and indirect jobs and opportunities for other contractual work for the locals, hence it contributes to overall social upliftment in the region.

2. **Environmental benefits:**

Wind energy is a sourced as a renewable form of energy**.** It does not generate waste or contaminate water—an extremely important factor given the scarcity of water. Unlike fossil fuels and nuclear power plants, wind energy has one of the lowest water-consumption footprints, which makes it a key for conserving hydrological resources. It is a very clean energy source, which does not release any pollution or produce any waste during operation.

Wind is actually a form of solar energy. It is caused by the heating of the atmosphere by the sun, the rotation of the Earth, and the Earth's surface irregularities. For as long as the sun shines and the wind blows, the energy produced can be harnessed to send power across the grid.

3. **Economic benefits:**

The project created direct and indirect jobs for the local people such as security guard, office staff, etc. Also, skilled manpowers are employed in the project for various technical functionalities. Additionally, the project greatly benefits the economy in rural areas, where the wind project is located. . The nearby farmers and local vendors are benefitted with added income near the Wind project site by means of shops, tea stalls, etc., thus added additional income. The project has already created income avenues for local business/contractors as there are many outsourced activities are involved both during construction and after the operation of the project. The project contributes to the economic sustainability through promotion of decentralization of economic power, leading to diversification of the national energy supply, which is dominated by conventional fuel based generating units.

Thus, the Wind energy project results in jobs in rural communities in manufacturing, transportation and project construction. As per statistics, Wind energy sector employment reached a new high of more than 116,800 full-time workers at the end of 2020. According to the ***Wind Vision Report***, wind has the potential to support more than 600,000 jobs in manufacturing, installation, maintenance, and supporting services by 2050.

Thus, the project activity is contributing to various sustainable benefits which can be realized both in direct and indirect forms and positive impacts are realizable across the operational lifetime of the project. However, during the current monitoring period no claim related to any of the impact categories has been claimed, hence not monitored separately or reported.

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 18, 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 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- 2022 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 18)

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 1.5 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 18 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 to the fossil fuel dominated Indian electricity grid system and finally supplied to identified consumer facility via wheeling arrangement. Thus, the project activity meets this applicability conditions.
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 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	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 implementation of the project activity. Thus, Project activity is a Greenfield plant and satisfies this applicability condition (a).

Applicability Criterion	Project Case
plant(s).	
4. Wind 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/m2	As the project activity is a wind power plant, hence this criterion (a) is not applicable for the project activity.
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 1.5 MW, which is only the single renewable component with no provision of Co-firing fossil fuel. Hence, this criterion is 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, hence no capacity addition. 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 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.	This is not relevant to the project activity as the project involves only wind power generating units.

Applicability Criterion	Project Case
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.

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

As per applicable methodology AMS-I.D. Version 18, "*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_2O	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_2O	No	Project activity does not emit N_2O
		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

Thus, ER_y = $BE_y – PE_y – LE_y$

Where:

ER_y = Emission reductions in year y (tCO_2/y)

BE_y = Baseline Emissions in year y ($t CO_2/y$)

PE_y = Project emissions in year y (tCO_2/y)

LE_y = Leakage emissions in year y (tCO_2/y)

Baseline Emissions

Baseline emissions include only CO_2 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:

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

Where:

BE_y	=	Baseline emissions in year y ($t CO_2$)
$EG_{PJ,y}$	=	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 18, 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-18, '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 reduction achieved during the first CoU period (01/01/2014 to 30/04/2022) are estimated as follows:

- This is the annual average generation and corresponding CoUs based on actual data:
  $BE_{y,avg}$ = 1,943.55 MWh/year ✕ 0.9 tCO_2/MWh
  = 1,588.44tCO_2/year (i.e., 2,365 CoUs/year)

Overall emission reduction achieved by the project activity for this current monitoring period is demonstrated below:

$BE_{y,total}$ = 15,890.4500 MWh × 0.9 tCO2/MWh
= 14,296 tCO2e

ERy = BEy – PEy – LEy
=14,296–0– 0
= 14,296 tCO2e

The final net ER value considered for claim for the current monitoring period = 14,296 tCO2e (i.e., 14,296 CoUs).

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 activity consists of two wind machines. Following are the key details under the prior history of the project:

(a) 1.5 MW Wind power project in Tamil Nadu was commissioned on 30/03/2003 and since then it is operational without any change in project design.
(b) The project was not applied under any other GHG mechanism; except under UCR.
(c) Thus, CoUs to be claimed under this project activity does not lead to any double accounting of emission reductions claim.

C.7. Monitoring period number and duration>>

Number : First Monitoring Period
Duration : 8 years, 04 months
01/01/2014 to 30/04/2022 (inclusive of both dates)

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

Not applicable (i.e. there is no change in the start date of crediting period), as the project is submitted under UCR as a fresh project.

The crediting period under UCR has been considered from 01/01/2014.
This is because the WTGs under the project were commissioned during 2003 and currently no GHG emission reduction has been claimed under the project since 30 March, 2003.

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 16, Year 2021) 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	$EG_{PJ, y}$
Data unit	MWh / year
Description	Net electricity supplied to the grid by the project activity
Source of data	NSL records / TNEB records
Measurement procedures (if any):	PP has referred to the #(ii) of the measurement procedure prescribed

	under the registered PCN. As per the monthly accounting procedure reflected in the monthly statement (e.g., JMR and Invoices etc.) However, if the monthly statement does not directly provide "net electricity" units, then quantity of net electricity supplied to the grid shall be calculated using the parameters reflected in the monthly document, such as Export units and Import units. Thus, the difference between the measured quantities of the grid export and the import will be considered as net export: $EG_{PJ,y} = EG_{Export} - EG_{Import}$ (Calculation has been referred in the ER sheet)
Measurement Frequency:	Monthly
Value applied:	1,943.55 (MWh/Year) (This is an annualized average value considered for reporting. The cumulative value for the entire monitoring period is 15,890.45 MWh; further details referred under the ER sheet)
QA/QC procedures applied:	Calibration of the KPTCL Main meters will be carried out once in five years as per National Standards (as per the provision of CEA, India) and faulty meters will be duly replaced immediately as per the provision of power purchase agreement. The energy meter details are attached in Appendix-1 for further reference. Any change/replacement in energy meters shall be addressed during periodic verification. The net amount of electricity considered for ER estimate which will be anyhow based on monthly statements to be issued by KPTCL, which can be further cross verified by the monthly bills.
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:

A. WTG details:

Sl. No	Site Name	Connected SS	Feeder Name	Location Name	Old HT.Sc.No	New HT.Sc.No
1	Panagudi Site	AnnaNagar TNEB SS 110/ 33/11KV	MRF	AXLES - 1	534	079204720534
				Anna Nagar SS		
2		Panagudi TNEB SS 110 / 11KV	Kanthagiri	AXLES - 2	535	079204720535
				Panagudi SS		

B. Technical specification of the wind machine:

Power		
Rated power:		750.0 kW
Flexible power ratings:		-
Cut-in wind speed:		4.0 m/s
Rated wind speed:		16.0 m/s
Cut-out wind speed:		25.0 m/s
Survival wind speed:		60.0 m/s
Wind zone (DIBt):		-
Wind class (IEC):		-
Rotor		
Diameter:		48.2 m
Swept area:		1,824.0 m²
Number of blades:		3
Rotor speed, max:		22.0 U/min
Tip speed:		56 m/s
Type:		LM 23.5/AL 23
Material:		GFK
Manufacturer:		LM Glasfieber/AL
Power density 1:		411.2 W/m²
Power density 2:		2.4 m²/kW
Gear box		
Type:		spur/planetary
Stages:		2
Ratio:		0.088888889
Manufacturer:		Brook/Hansen

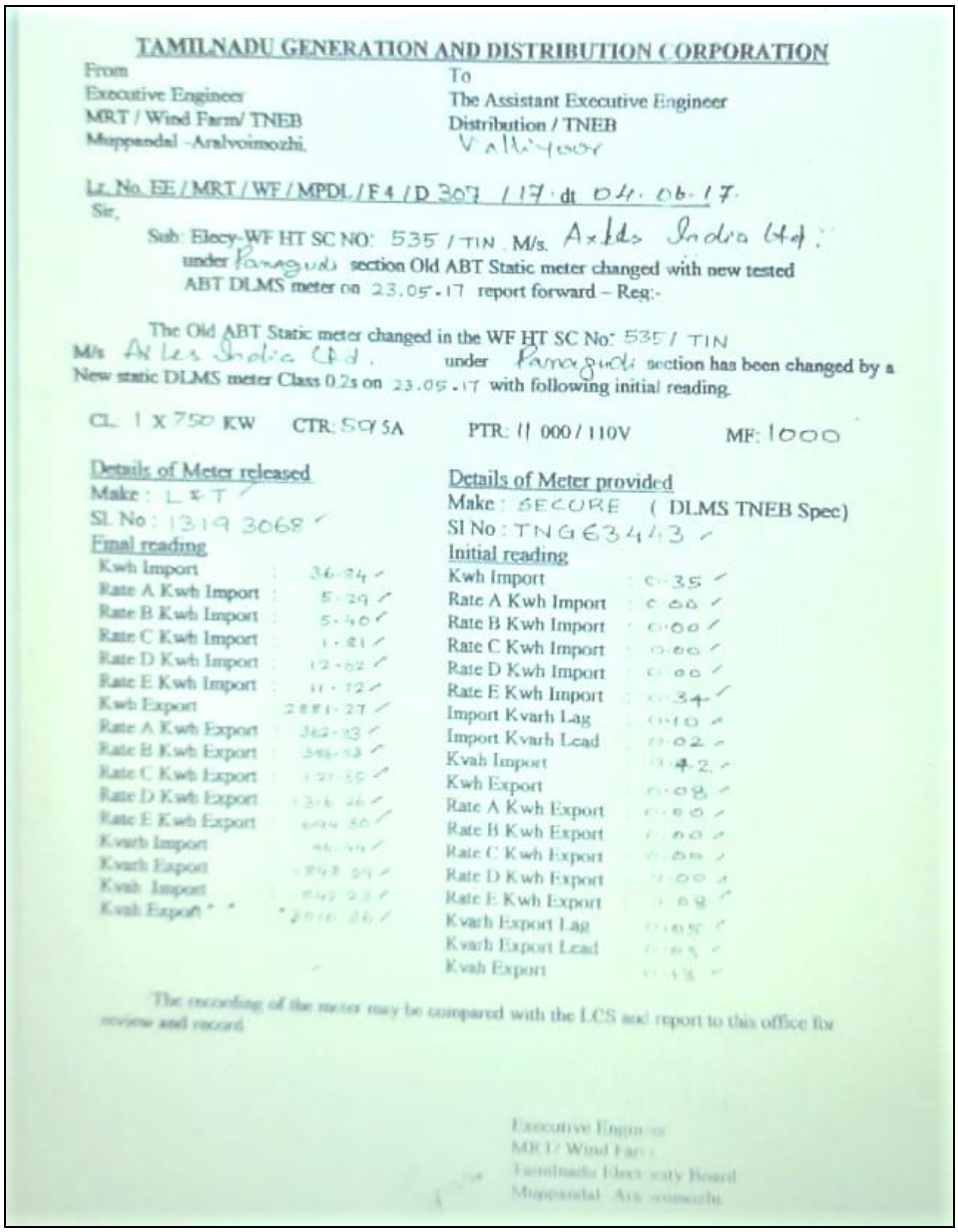
Generator		
Type:		Asynchronous
Number:		1
Speed, max:		1,500.0 U/min
Voltage:		690.0 V
Grid connection:		Thyristor
Grid frequency:		50.0 Hz
Manufacturer:		Elin
Tower		
Hub height:		50/60/70 m
Type:		Steel tube
Shape:		conical
Corrosion protection:		painted
Manufacturer:		NEG Micon (currently under VESTAS)
Weight		
Single blade:		-
Hub:		-
Rotor:		12.0 t
Nacelle:		22.0 t
Tower, max:		81.0 t
Total weight:		115.0 t

Appendix 2:

List of energy meters and their basic details:

Sl. No	Location	Energy Meter Make	Energy Meter Sl. No	Energy Meter Accuracy
1	AXLES - 01	SECURE	TNG63444	0.2 S
2	AXLES - 02	SECURE	TNG63443	0.2 S

The calibration sample copies are attached below:



TAMILNADU GENERATION AND DISTRIBUTION CORPORATION

From
Executive Engineer
MRT / Wind Farm/ TNEB
Muppandal -Aralvoimozhi.

To
The Assistant Executive Engineer
Distribution / TNEB
Valliyoor

Lr. No. EE / MRT / WF / MPDL / F 4 / D 307 / 17 dt 04.06.17.

Sir,

Sub: Elecy-WF HT SC NO: 535 / TIN. M/s. Axles India Ltd.
under Panagudi section Old ABT Static meter changed with new tested
ABT DLMS meter on 23.05.17 report forward – Reg:-

The Old ABT Static meter changed in the WF HT SC No: 535 / TIN
M/s Axles India Ltd. under Panagudi section has been changed by a
New static DLMS meter Class 0.2s on 23.05.17 with following initial reading.

CL 1 X 750 KW CTR: 50/5A PTR: 11 000 / 110V MF: 1000

Details of Meter released		Details of Meter provided	
Make : L & T		Make : SECURE (DLMS TNEB Spec)	
Sl. No : 1319 3068		Sl No : TNG63443	
Final reading		Initial reading	
Kwh Import	36.84	Kwh Import	0.35
Rate A Kwh Import	5.29	Rate A Kwh Import	0.00
Rate B Kwh Import	5.40	Rate B Kwh Import	0.00
Rate C Kwh Import	1.81	Rate C Kwh Import	0.00
Rate D Kwh Import	12.62	Rate D Kwh Import	0.00
Rate E Kwh Import	11.72	Rate E Kwh Import	0.34
Kwh Export	2881.27	Import Kvarh Lag	0.10
Rate A Kwh Export	362.93	Import Kvarh Lead	0.02
Rate B Kwh Export	346.93	Kvah Import	0.42
Rate C Kwh Export	121.55	Kwh Export	0.08
Rate D Kwh Export	1316.26	Rate A Kwh Export	0.00
Rate E Kwh Export	694.30	Rate B Kwh Export	0.00
Kvarh Import	45.94	Rate C Kwh Export	0.00
Kvarh Export	1393.99	Rate D Kwh Export	0.00
Kvah Import	543.23	Rate E Kwh Export	0.08
Kvah Export	2910.26	Kvarh Export Lag	0.05
		Kvarh Export Lead	0.05
		Kvah Export	0.13

The recording of the meter may be compared with the LCS and report to this office for review and record.

Executive Engineer
MRT/ Wind Farm
Tamilnadu Electricity Board
Muppandal, Aralvoimozhi

TAMILNADU GENERATION AND DISTRIBUTION CORPORATION

From
Executive Engineer
MRT / Wind Farm/ TNEB
Muppandal -Aralvoimozhi.

To
The Assistant Executive Engineer
Distribution / TNEB
Panaguali

Lr. No. EE / MRT / WF / MPDL / F4 / D 200 / 17 dt 1.6.17.

Sir,

Sub: Elecy-WF HT SC NO. 534 / TIN. M/s. Axles India (P) Ltd under Panaguali section Old ABT Static meter changed with new tested ABT DLMS meter on 23.5.17 report forward – Reg:-

The Old ABT Static meter changed in the WF HT SC No. 534 / TIN. M/s Axles India (P) Ltd. under Panaguali section has been changed by a New static DLMS meter Class 0.2s on 23.5.17 with following initial reading.

CL: 1 X750 KW CTR: 50/5A PTR: 11000/110V MF: 1000

Details of Meter released		Details of Meter provided	
Make : L&T		Make : Secure (DLMS TNEB Spec)	
Sl. No : 13193084		Sl No : TNQ : 63444	
Final reading		Initial reading	
Kwh Import	: 42.69	Kwh Import	0.35
Rate A Kwh Import	: 6.45	Rate A Kwh Import	0.00
Rate B Kwh Import	: 6.26	Rate B Kwh Import	0.00
Rate C Kwh Import	: 2.00	Rate C Kwh Import	0.00
Rate D Kwh Import	: 14.57	Rate D Kwh Import	0.00
Rate E Kwh Import	: 13.39	Rate E Kwh Import	0.34
Kwh Export	: 3273.11	Import Kvah Lag	0.10
Rate A Kwh Export	: 351.09	Import Kvarh Lead	0.02
Rate B Kwh Export	: 498.45	Kvah Import	0.42
Rate C Kwh Export	: 153.79	Kwh Export	0.08
Rate D Kwh Export	: 1524.61	Rate A Kwh Export	0.00
Rate E Kwh Export	: 845.17	Rate B Kwh Export	0.00
Kvarh Import	: 41.47	Rate C Kwh Export	0.00
Kvarh Export	: 2327.80	Rate D Kwh Export	0.00
Kvah Import	781.85	Rate E Kwh Export	0.08
Kvah Export	: 4156.03	Kvarh Export Lag	0.05
		Kvarh Export Lead	0.03
		Kvah Export	0.13

The recording of the meter may be compared with the LCS and report to this office for review and record.

Executive Engineer
MRT/ Wind Farm
Tamilnadu Electricity Board
Muppandal- Aralvoimozhi

Appendix 3:

Final summary of CoUs claim under this monitoring period:

	Year	Net MWH	Net CoU	Final CoUs considered	
	2014	1,985.1400	1,786.63	1,786	Final for the vintage
	2015	1,175.1000	1,057.59	1,057	Final for the vintage
	2016	2,150.4700	1,935.42	1,935	Final for the vintage
	2017	2,518.0200	2,266.22	2,266	Final for the vintage
	2018	1,946.3200	1,751.69	1,751	Final for the vintage
	2019	1,927.7600	1,734.98	1,734	Final for the vintage
	2020	1,896.9300	1,707.24	1,707	Final for the vintage
	2021	1,948.6400	1,753.78	1,753	Final for the vintage
	2022*	342.0700	307.86	307	Final for the vintage
Total =		15,890.4500	14,301	**14,296**	**Total Claimed**
Annual avg. =		1,943.55	1,589.05	1,588.00	Average

Comparison with Ex-ante estimate		
Ex-ante estimated value as per UCR PCN =	2,365	CoUs/year
Ex-ante comparative value during the current monitoring period =	19,710	CoUs
Actual COUs achieved during the current monitoring period =	14,296	CoUs
Variation in CoUs =	-27.47%	Fraction