Monitoring Report

CARBON OFFSET UNIT (CoU) PROJECT

Title: 1.5 MW Wind Project by Priya Aqua Farms in Tamil Nadu

.

Version 2.0
Date 05/08/2022

First COU Issuance Period:
8 years, 05 months

Date:
01/01/2014 to 31/05/2022

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

Monitoring Report	
Title of the project activity	1.5 MW Wind Project by Priya Aqua Farms in Tamil Nadu.
UCR project registration code	175
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 31/05/2022
Project participants	Priya Aqua Farms (Project owner) 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: 1,847 CoUs (1,847 tCO_{2eq})
	2015: 1,202 CoUs (1,202 tCO_{2eq})
	2016: 2,147 CoUs (2,147 tCO_{2eq})
	2017: 2,500 CoUs (2,500 tCO_{2eq})
	2018: 1,968 CoUs (1,968 tCO_{2eq})
	2019: 1,981 CoUs (1,981 tCO_{2eq})
	2020: 1,958 CoUs (1,958 tCO_{2eq})
	2021: 1,921 CoUs (1,921 tCO_{2eq})
	2022: 750 CoUs (750 tCO_{2eq})
Total:	**16,274 CoUs (16,274 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 "PRIYA AQUA FARMS" which is an Independent Power Producer (IPP) focusing on producing green power and establishing environmental and social sustainability; hereinafter called as project proponent or PP, engaged 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 ranging between 1.5 MW; manufactured and supplied by NEG Mecon and GE. The total aggregated installed capacity is 1.5 MW in village Panagudi, Tirunelveli district in the state of Tamil Nadu (India).

The project activity aims to harness kinetic energy of wind (renewable source) to generate electricity. It is capable to generate 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 purchase arrangement with the Tamil Nadu Electricity Board.

The project activity has achieved total GHG emission reduction of 16,274 tCO2e for overall period of 8 years 5 months starting from 01/01/2014 to 31/05/2022 (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

More details about the machine are given on Appendix 1.

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

UCR Project ID or Date of Authorization: 175
Start Date of Crediting Period: 01/01/2014
Project Commissioned: 30/03/2003
Monitoring Period: 01/01/2014 to 31/05/2022

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	31/05/2022
Total ERs generated (tCO_{2eq})	16,274 (tCO_2eq)
Leakage	0

e) Baseline Scenario>>

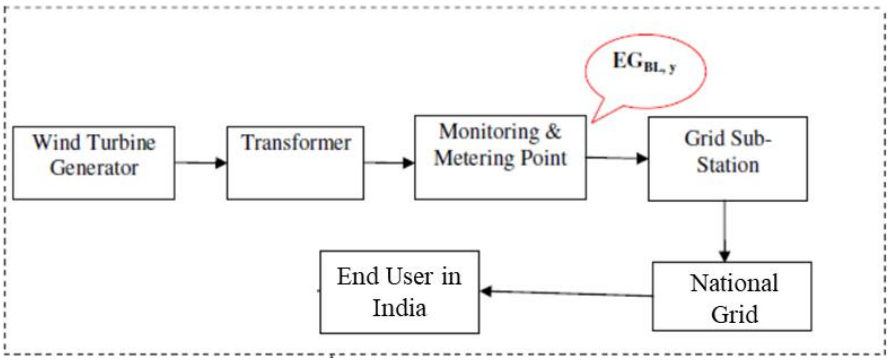
The baseline scenario identified at the PCN stage of the project activity is:

- Grid

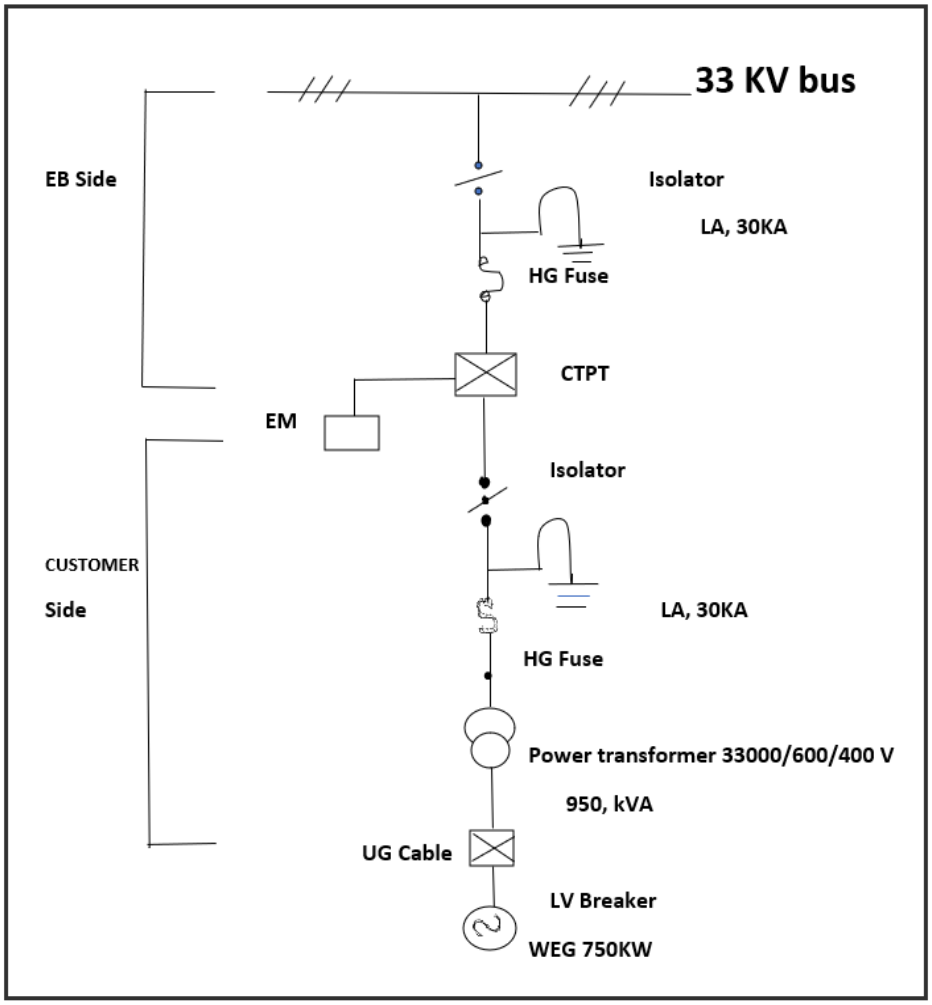
In the absence of the project activity, the equivalent amount of electricity would have been generated from fossil fuel-based power plants to be added into the southern regional grid (which is connected to the unified Indian Grid system) and further to be supplied to the captive consumers. The national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

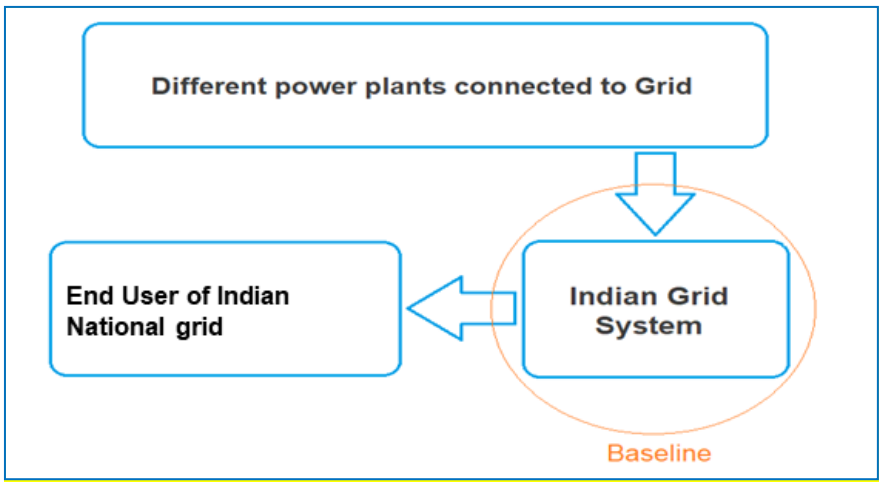
Project Scenario:



Technical layout of the project is given below:



Baseline Scenario:

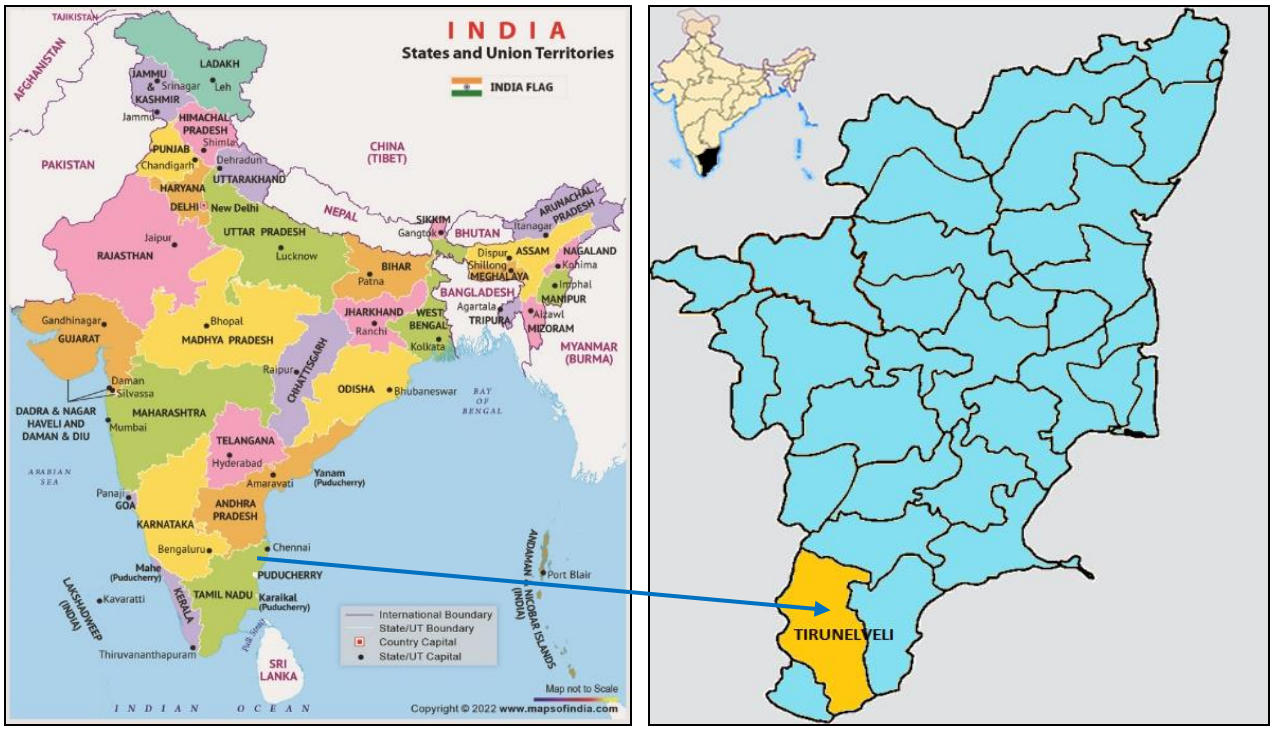


A.2. Location of project activity>>

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:** PRIYA AQUA FARMS **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 31/05/2022 (inclusive of both dates).

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

Particulars	Details
Name	Mr. Rajnikant. A
Project Proponent:	PRIYA AQUA FARMS
Authorized Representative:	NSL Renewable Power Private Limited.
Address	C/o NSL, 8 - 2-684/2/A, 4th Floor, Road.No.12, Banjara Hills, Hyderabad - 500034, 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 ID		Co Ordinates		Village Names	Taluk	District	Commissioning Date (COD)
		WTG HT SC NO.	East	North				
1	WHEELS - 1	532	782303	920901	Panagudi	Radhapuram	Tirunelveli	30/3/2003
2	WHEELS - 2	533	782225	920650	Panagudi	Radhapuram	Tirunelveli	

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)	10/06/2022
2	UCR Registration/Approval	13/06/2022
3	UCR Monitoring Report (version 01)	20/06/2022
4	UCR Verification, appointment of verifier	27/06/2022

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

Technical details are included 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:**
    - Local employment, better health, job opportunities, job creation, improvement of life standard, local income development for small businesses, overall demographic impacts and community development can be achieved in long run.
    - It has led to development of infrastructure around the project area in terms of improved road network etc. and will also directly contribute to the development of renewable infrastructure in the region.

2. **Environmental benefits:**
    - Primarily, wind energy does not cause water or air emissions, and do not produce any kind of hazardous waste as well. Moreover, wind power does not make use of natural resources like oil, gas or cause and therefore will not cause damage to the environment through resource transportation and extraction and also do not need consequent amounts of water during operation.
    - Wind energy is not only a favourable electricity generation technology that reduces emissions (of other pollutants as well as CO2, SO2 and NOx), it also avoids significant amounts of external costs of conventional fossil fuel-based electricity generation. Thus, prevent the problem of global warming as compared to the project baseline.

3. **Economic benefits:**
    - The project created direct and indirect jobs for the local people such as security guard, office staff, etc.
    - Also, skilled man-powers 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.

4. **Technological well-being:**
    - Being a clean energy project, the project promotes technological well-being in the state
    - Direct contribution to grid mix leading to energy security in the country

    Example setting for peer companies/investors to consider clean technology projects

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 plant(s).	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
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 31/05/2022) are estimated as follows:

$BE_{y,avg}$ = 2,156.70 MWh/year ✕ 0.9 tCO_2/MWh
= 1808.79 tCO_2/year (i.e., against the ex-ante value of 2,365 CoUs/year)

This is the annual average generation and corresponding CoUs based on actual data.

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

$BE_{y,total}$ = 18,087.87 MWh × 0.9 tCO2/MWh
= 16,274 tCO2e

ERy = BEy – PEy – LEy
=16,274– 0– 0
= 16,274 tCO2e

The final net ER value considered for claim for the current monitoring period = 16,274 tCO2e (i.e., 16,274CoUs).

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, 05 months
01/01/2014 to 31/05/2022 (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., B-form 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:	2156.70 (MWh/Year) *(*This is an annualized average value considered for reporting. The cumulative value for the entire monitoring period is 18,087.87 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:

Connected SS	Feeder Name	Location Name	Old HT.SC. No	New HT.SC. No	Coordinates	
					East	North
Panagudi TNEB SS 110 / 11KV	Phase - 1	WHEELS - 1	532	O79204720532	782303	920901
		Panagudi SS			783766	919429
AnnaNagar TNEB SS 110/ 33/11KV	MRF	WHEELS - 2	533	O79204720533	782225	920650
		Anna Nagar SS			782498	921113

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

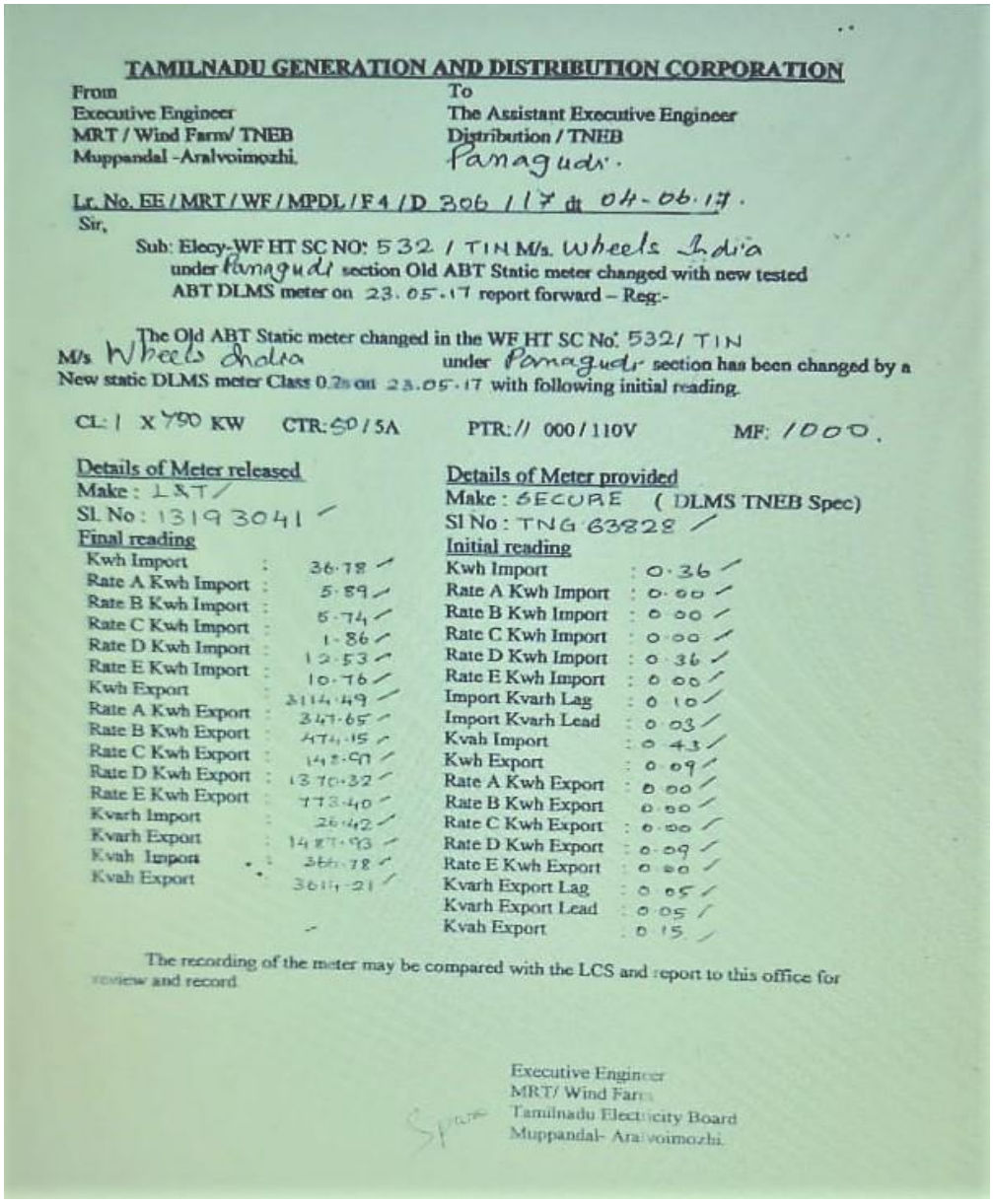
Speed, max:		1,500.0 U/min
Voltage:		690.0 V
Grid connection:		Thyristor
Grid frequency:		50.0 Hz
Manufacturer:		Elin
Tower		
Hub height:		50/60/70 m
Type:		Steel tube
Shape:		conical
Corrosion protection:		painted
Manufacturer:		NEG Micon (currently under VESTAS)
Weight		
Single blade:		-
Hub:		-
Rotor: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

Appendix 2:

Details of the energy meters and their last calibration details are attached:

Priya Aqua Farms Energy Meter details

Sl. No	Location	Energy Meter Make	Energy Meter Sl. No	Energy Meter Accuracy
1	WHEELS - 01	SECURE	TNG63828	0.2 S
2	WHEELS - 02	SECURE	TNG63907	0.2 S



TAMILNADU GENERATION AND DISTRIBUTION CORPORATION

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

To
The Assistant Executive Engineer
Distribution / TNEB
Panagudi.

Lr. No. EE / MRT / WF / MPDL / F 4 / D 306 / 17 dt 04-06-17.

Sir,

Sub: Elecy-WF HT SC NO: 532 / TIN M/s. Wheels India 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. 532/ TIN M/s Wheels India 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 990 KW CTR: 50 / 5A PTR: // 000 / 110V MF: 1000.

Details of Meter released		Details of Meter provided	
Make : L&T		Make : SECURE (DLMS TNEB Spec)	
Sl. No : 13193041		Sl No : TNG 63828	
Final reading		**Initial reading**	
Kwh Import	36.78	Kwh Import	0.36
Rate A Kwh Import	5.89	Rate A Kwh Import	0.00
Rate B Kwh Import	5.74	Rate B Kwh Import	0.00
Rate C Kwh Import	1.86	Rate C Kwh Import	0.00
Rate D Kwh Import	12.53	Rate D Kwh Import	0.36
Rate E Kwh Import	10.76	Rate E Kwh Import	0.00
Kwh Export	3114.49	Import Kvarh Lag	0.10
Rate A Kwh Export	347.65	Import Kvarh Lead	0.03
Rate B Kwh Export	474.15	Kvah Import	0.43
Rate C Kwh Export	142.91	Kwh Export	0.09
Rate D Kwh Export	1370.32	Rate A Kwh Export	0.00
Rate E Kwh Export	773.40	Rate B Kwh Export	0.00
Kvarh Import	26.42	Rate C Kwh Export	0.00
Kvarh Export	1487.93	Rate D Kwh Export	0.09
Kvah Import	366.78	Rate E Kwh Export	0.00
Kvah Export	3611.21	Kvarh Export Lag	0.05
		Kvarh Export Lead	0.05
		Kvah Export	0.15

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
Panagudi

Lr. No. EE / MRT / WF / MPDL / F 4 / D 654 / 17 dt 16.6.17.

Sir,

Sub: Elecy-WF HT SC NO: 533 / TIN. M/s. Wheels India 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: 533 / TIN M/s Wheels India 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: 11000 / 110V MF: 1000.

Details of Meter released		Details of Meter provided	
Make : L&T		Make : SECURE (DLMS TNEB Spec)	
Sl. No : 14192107		Sl No : TNG 63907	
Final reading		Initial reading	
Kwh Import	40.08	Kwh Import	0.36
Rate A Kwh Import	6.34	Rate A Kwh Import	0.02
Rate B Kwh Import	5.79	Rate B Kwh Import	0.31
Rate C Kwh Import	1.84	Rate C Kwh Import	0.00
Rate D Kwh Import	14.98	Rate D Kwh Import	0.02
Rate E Kwh Import	11.13	Rate E Kwh Import	0.00
Kwh Export	3153.91	Import Kvarh Lag	0.08
Rate A Kwh Export	353.57	Import Kvarh Lead	0.03
Rate B Kwh Export	453.29	Kvah Import	0.43
Rate C Kwh Export	150.13	Kwh Export	0.08
Rate D Kwh Export	1364.71	Rate A Kwh Export	0.00
Rate E Kwh Export	832.21	Rate B Kwh Export	0.08
Kvarh Import	47.34	Rate C Kwh Export	0.00
Kvarh Export	1585.35	Rate D Kwh Export	0.00
Kvah Import	618.44	Rate E Kwh Export	0.00
Kvah Export	3502.19	Kvarh Export Lag	0.04
		Kvarh Export Lead	0.04
		Kvah Export	0.03

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	2,052.8200	1,847.54	1,847	Final for the vintage
	2015	1,336.1600	1,202.54	1,202	Final for the vintage
	2016	2,386.3500	2,147.72	2,147	Final for the vintage
	2017	2,777.9400	2,500.15	2,500	Final for the vintage
	2018	2,187.2100	1,968.49	1,968	Final for the vintage
	2019	2,201.9150	1,981.72	1,981	Final for the vintage
	2020	2,176.2200	1,958.60	1,958	Final for the vintage
	2021	2,134.9950	1,921.50	1,921	Final for the vintage
	2022*	834.2600	750.83	750	Final for the vintage
Total =		18,087.8700	16,279.08	**16,274**	**Total claimed**
Annual avg. =		2,156.70	1,808.79	1,808.00	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 =	19,911	CoUs
Actual COUs achieved during the current monitoring period =	16,274	CoUs
Variation in CoUs =	-18.27%	Fraction