Monitoring Report

CARBON OFFSET UNIT (CoU) PROJECT

Title: 1.25 MW Wind Project by MPR Wind Farms in Karnataka.

Version 2.0
Date 05/08/2022

First COU Issuance Period:
8 years, 05 months

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

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

Monitoring Report	
Title of the project activity	1.25 MW Wind Project by MPR Wind farms in Karnataka.
UCR project registration code	173
Version	2.0
Completion date of the MR	5/08/2022
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	MPR Wind farms.
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: 2,015 CoUs (2,015 tCO_{2eq})
	2015: 2,565 CoUs (2,565 tCO_{2eq})
	2016: 2,214 CoUs (2,214 tCO_{2eq})
	2017: 2,052 CoUs (2,052 tCO_{2eq})
	2018: 2,017 CoUs (2,017 tCO_{2eq})
	2019: 2,013 CoUs (2,013 tCO_{2eq})
	2020: 1,945 CoUs (1,945 tCO_{2eq})
	2021: 1,908 CoUs (1,908 tCO_{2eq})
	2022: 537 CoUs (537 tCO_{2eq})
Total:	**17,266 CoUs (17,266 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 "MPR Wind Farms" which is an Independent Power Producer (IPP) focusing on producing green power and establishing environmental and social sustainability. This project is a greenfield power project through tapping of wind energy available in the existing barren land available in the identified project site, in the state of Karnataka in India. The project activity is installation and operation of total 1 Wind Turbine Generators (WTGs) having capacity of 1.25 MW; manufactured and supplied by Suzlon. Thus total aggregated installed capacity of the project is 1.25 MW, located in village Harogeri, Gadag district in the state of Karnataka (India).

The project activity aims to harness kinetic energy of wind (renewable source) to generate electricity. It is capable to generate around 2,190 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 Karnataka State Electricity Board (KSEB), where power is being sold to HESCOM (Hubli Electricity Supply Company Limited).

The project activity has achieved total GHG emission reduction of 17,266 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 KPTCL at Gadag (66/11 kV substation). 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	1,250 KW
Rotor Type	3 blade, upwind /horizontal axis
Gearbox Type	One planetary stage and two helical stages
Generator Type	Dual speed induction generator (asynchronous)
Tower Type	Tubular tower with welded steel
Breaking system	3 independent systems with blade pitching
Yaw system	Electric asynchronous motor, electric motor brake (spring applied), 5 stages planetary gear box with output pinion
Pitch system	3 independent blade pitch control with battery backup for each blade
Controller	Suzlon Control System

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

UCR Project ID or Date of Authorization: 173
Start Date of Crediting Period: 01/01/2014
Project Commissioned: 28/09/2006
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})	17,266 (tCO_{2eq})
Leakage	0

e) Baseline Scenario>>

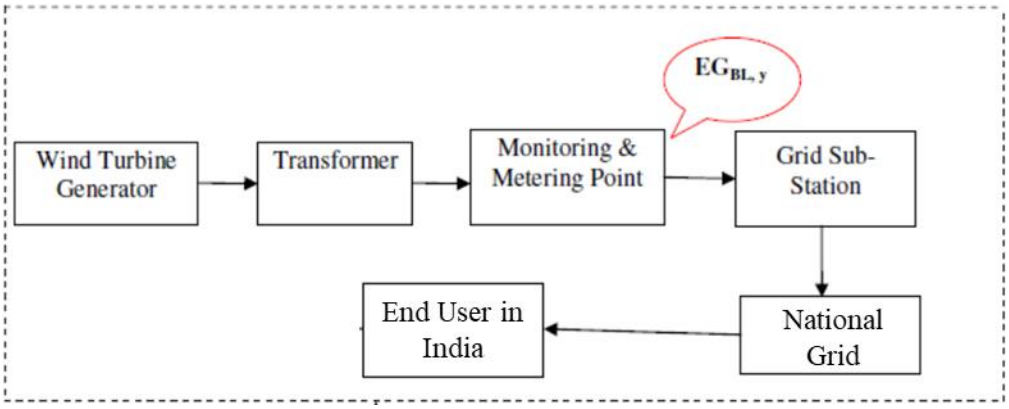
The baseline scenario identified at the PCN stage of the project activity is:

- Grid

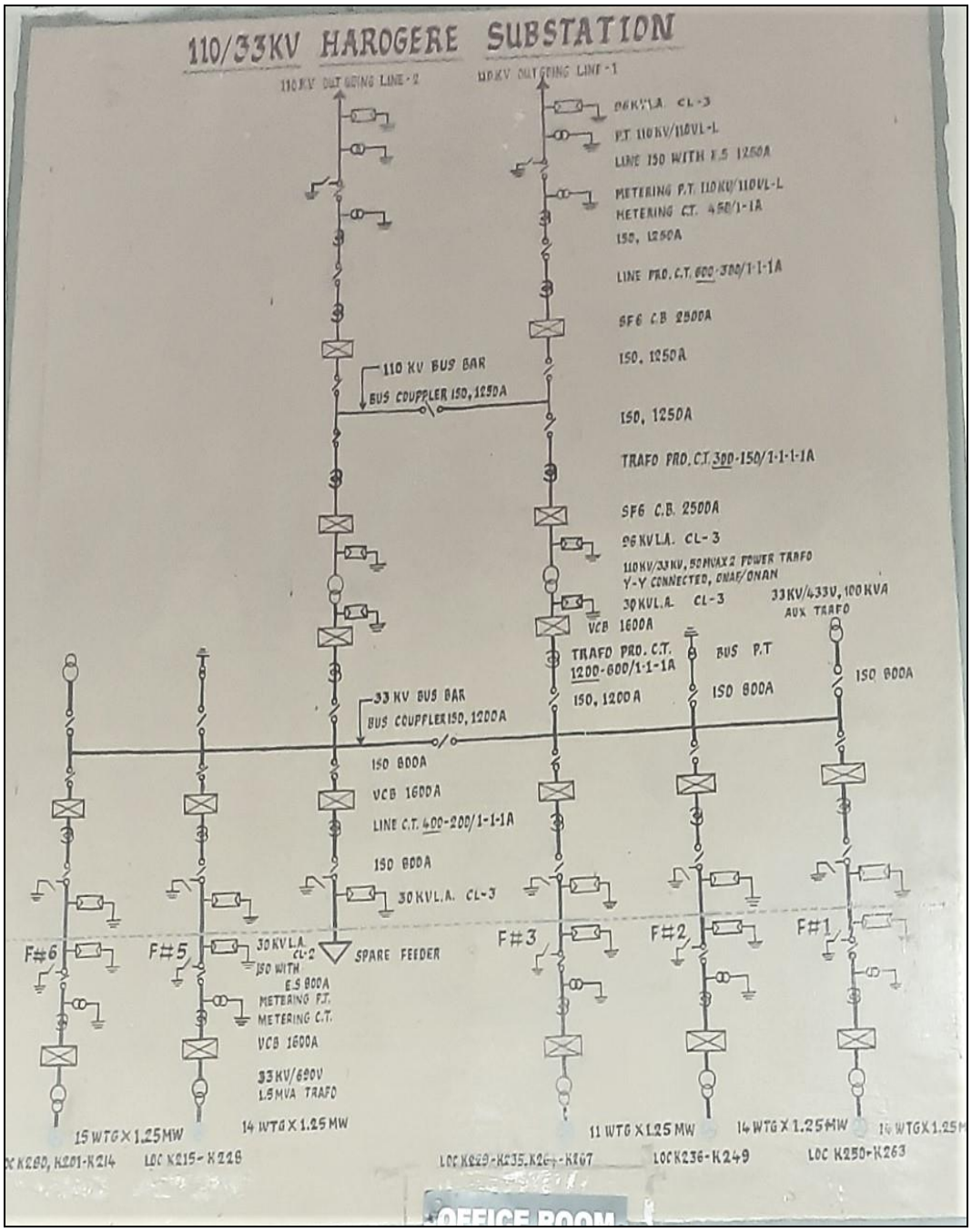
In the absence of the project activity, the equivalent amount of electricity would have been generated from fossil fuel-based power plants and exported to the southern regional grid (which is connected to the unified Indian Grid system) as national grid is predominantly sourcing from fossil fuel-based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

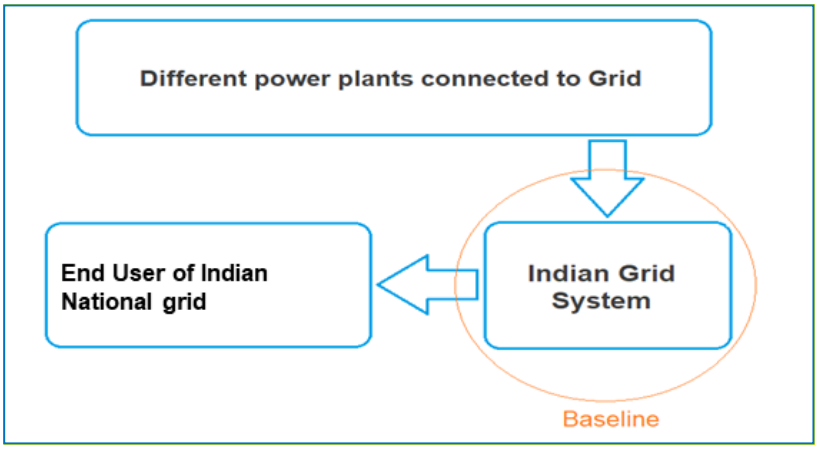
Project Scenario:



Technical layout of the project:



Baseline Scenario:

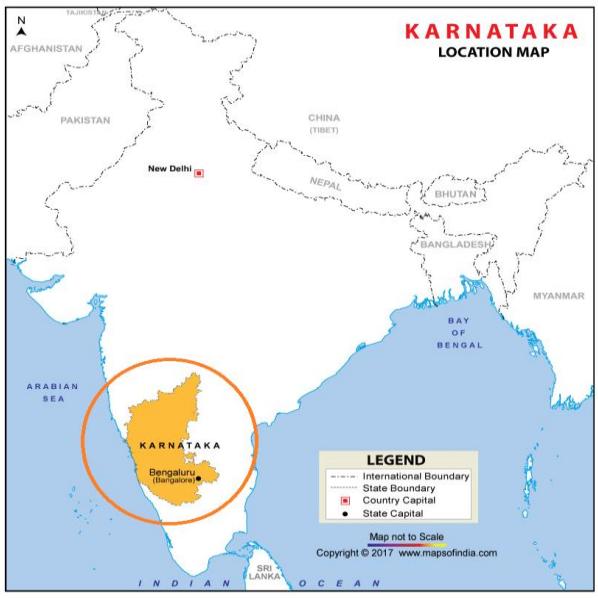


A.2. Location of project activity>>

The project machines are located at in village Harogeri, Gadag district in the state of Karnataka (India). Gadag is approximately 416.4 km from Bangalore, capital of Karnataka. 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 Karnataka Renewable Energy Development Limited.

Country : India
States : Karnataka
District: Gadag
Village: Harogeri

The representative location map is included below:



(Image courtesy: Google maps & images)

Machine wise geo-coordinates are listed below:

Loc #	Latitude	Longitude	Village	Taluka	District
K-214	15^0 12′ 11 .43′′	75^0 45′ 36.55′′	Harogeri	Mundaragi	Gadag

A.3. Parties and project participants >>

Party (Host)	Participants
India	**NSL Renewable Power Private Limited.** Contact details: Mr. Rajnikant. A rajnikant.a@nslpower.com Address: 8 - 2-684/2/A, 4th Floor, Road.No.12, Banjara Hills, Hyderabad - 500034, Telangana, India **Project Proponent/Owner:** **MPR Wind Farms.**

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 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, 5 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
Company	**MPR Wind farms, Kappatgudda.**
Address	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:

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

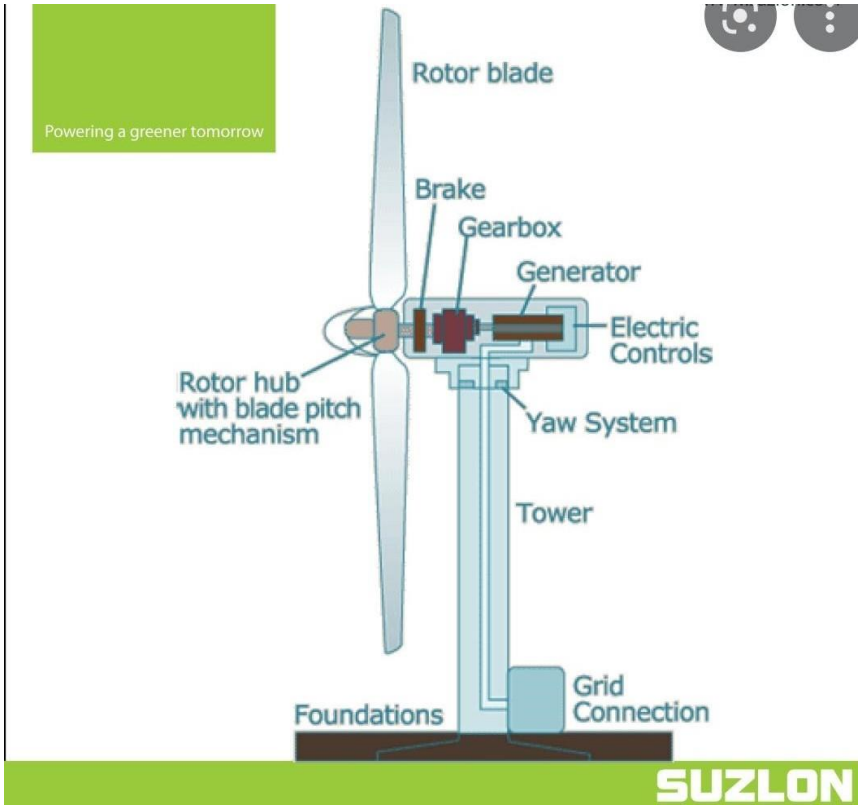
b) Information on the implementation and the actual operation of the project activity, including relevant dates:

Location	Commissioning Date (COD)
K-214	28/09/2006

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)	05/06/2022
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>>



More technical details are included under Appendix 1.

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

This project is a greenfield activity where grid power is 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.
There are social, environmental, economic and technological benefits which contribute to sustainable development.

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

1. **Social benefits:**
   (a) Assist in creating local jobs
   (b) Helps improving nearby infrastructures such as access roads
   (c) No adverse effects on health as there is no fossil fuel components attached to the project and also no waste generated in the process.

2. **Environmental benefits:**
   (a) Wind energy does not emit toxic substances or contaminants into the air, water and soil, hence zero impact on the environment
   (b) There is negligible amount of surface usages as compared to the baseline, hence no negative impact on local ecosystem.
   (c) Due to zero discharge of any pollutant elements in the process, there is no environmental hazards produced due to the project
   (d) The maintenance related products such as oil, grease etc. if left out are sent for recycling, hence zero impact.

3. **Economic benefits:**
   (a) Direct Employment
   (b) Investment received in developing
   (c) Opportunities created for local vendors, contractors to take part in various activities related to the project, both during construction and operational phase
   (d) With the development of better infrastructure, more trade opportunities are being generated, also energy tourism is foreseen.

4. **Technological well-being:**
   (a) Being a clean energy project, the project promotes technological well-being in the state
   (b) Direct contribution to grid mix leading to energy security in the country
   (c) Example setting for peer companies/investors to consider clean technology projects.

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- 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 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 1.25 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. 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 condition is 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 1.25 MW with no provision of Co-firing fossil fuel, only single renewable component (wind). Hence, this condition 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 addition of capacity is involved. 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:

$BE_{y,avg}$ = 2,132.27 MWh/year ✕ 0.9 tCO_2/MWh
= 1,918 tCO_2/year (i.e., 1,971 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:

$BE_{y,total}$ = 19,190.3887 MWh × 0.9 tCO2/MWh
= 17,266 tCO2e

ERy = BEy – PEy – LEy
= 17,266–0– 0
= 17,266 tCO2e

The final net ER value considered for claim for the current monitoring period = 17,266 tCO2e (i.e., 17,266CoUs).

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 has never been applied under any other GHG mechanism.
Hence project will not cause double accounting of carbon credits (i.e., COUs).

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 >>

There is no change in the start date of crediting period applicable during this PCN submission.

The start date of crediting under UCR is considered as 01/01/2014, as the WTGs under the project were commissioned during 2006 and currently no GHG emission reduction has been claimed under the project since 01 April 2011.

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 / KPTCL records
Measurement procedures (if any):	PP has referred to the #(iii) 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) the net units are calculated after adjusting import losses and Transmission losses. All these values such as Export, Import, Import Loss, Transmission losses etc. are reported under the calculation sheet. Thus, $EG_{PJ, y}$ is the net export which has been calculated from export and import values reported and/or the losses parameters. (Calculation has been referred in the ER sheet)

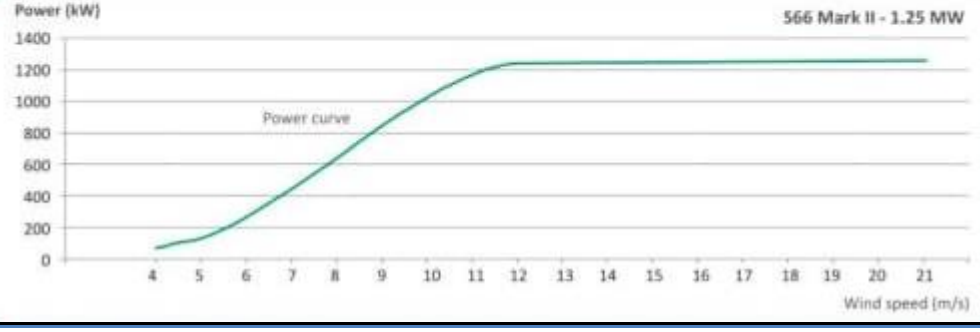
Measurement Frequency:	Monthly
Value applied:	2,132.27(MWh/Year) (This is an annualized average value considered for reporting. The cumulative value for the entire monitoring period is 19,190.3887 MWh; further details referred under the ER sheet)
QA/QC procedures applied:	Calibration of the KPTCL Main 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:

Technical specification of the wind machine included under this project:

S66 MARK II - 1.25 MW - POWER CURVE AND TECHNICAL SPECIFICATIONS

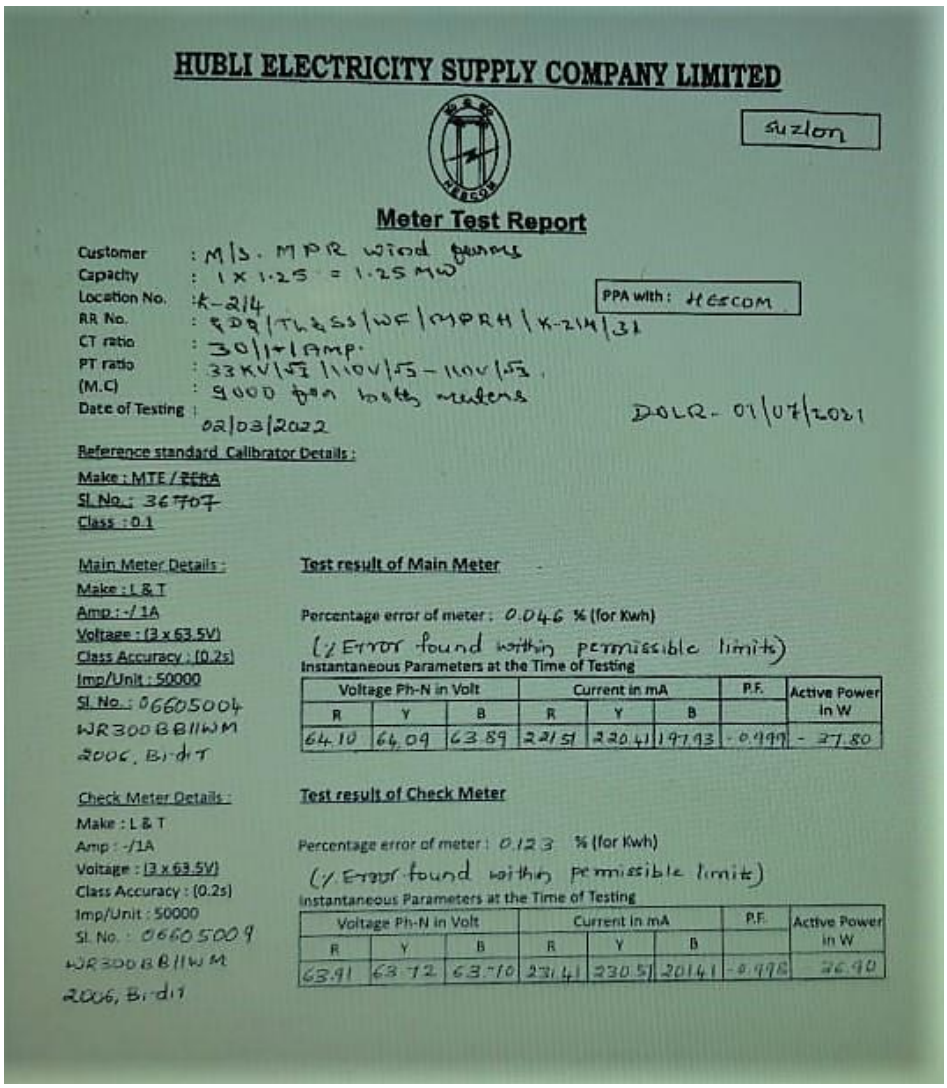
OPERATING DATA	Rated power	1,250 kW
	Cut-in wind speed	4 m/s
	Rated wind speed	12m/s
	Cut-off wind speed	20m/s
	Survival wind speed	52.5m/sec
ROTOR	Type	3 Blades, Upwind / Horizontal axis
	Diameter	66m
	Rotational speed at rated power	20.62rpm
	Rotor blade material	Epoxy bonded fiber glass
	Swept area	3,421 m^2
	Power regulation	Active pitch regulated
GEARBOX	Type	One planetary stage and two helical stages
	Ratio	1 : 74.9
	Nominal load	1,390 kW
	Type of cooling	Forced oil cooling lubrication system
GENERATOR	Type	Dual speed induction generator (asynchronous)
	Speed at rated power	1,006/1,506 rpm
	Rated power	300/1,250 kW
	Rated voltage	690 V AC (phase to phase)
	Frequency	50 Hz
	Insulation	Class H
	Enclosure	IP 56
	Cooling system	Air cooled (IC 411)
TOWER	Type	Tubular tower with welded steel
	Tower height	72m
	Hub height (including foundation)	74.5m
BRAKING SYSTEM	Aerodynamic braking	3 independent systems with blade pitching
	Mechanical braking	hydraulic disc brake activated by hydraulic pressure
YAW SYSTEM	Type	Electric asynchronous motor, electric motor brake (spring applied), 5 stage planetary gear box with output pinion
	Bearing	Friction bearing with gear rim
	Protection	Cable twist sensor, proximity sensor
PITCH SYSTEM	Type	3 independent blade pitch control with battery backup for each blade
	Operating range	0° to 90°
	Resolution	0° to 10 ° per sec
CONTROLLER		Suzlon Control System with following salient features:
		- Park slave - Power output control / limitation
		- Reactive power control - Grid measurement
		- Weather measurement - Time synchronization
		- Statistics
	Wind Class	III a
	Certification & standards	TC-GL-010A-2010 Rev. 1 & standard GL 2003 with supplement 2004
	Quality system	ISO 9001:2008



Appendix 2:

List of energy meters and their basic details:

MPR Wind Farms					
Energy Meter Serial numbers					
Sl.no	**R.R number**	**Make of Energy Meter**	**Energy Meter Accuracy**	**Main Meter**	**Check Meter**
1	K-214	L&T	0.2s	6605004	6605009



HUBLI ELECTRICITY SUPPLY COMPANY LIMITED

suzlon

Meter Test Report

Customer : M/s. MPR wind farms
Capacity : 1 X 1.25 = 1.25 MW
Location No. : K-214
PPA with : HESCOM
RR No. : SDO/TL&SS/WF/MPRH/K-214/31
CT ratio : 30/1+1AMP.
PT ratio : 33KV/√3 /110V/√3 - 110V/√3.
(M.C) : 9000 for both meters
Date of Testing : 02/03/2022
DOLR- 01/07/2021

Reference standard Calibrator Details :
Make : MTE / ~~ZERA~~
Sl No. : 36707
Class : 0.1

Main Meter Details :
Make : L & T
Amp : -/1A
Voltage : (3 x 63.5V)
Class Accuracy : (0.2s)
Imp/Unit : 50000
Sl. No. : 06605004
WR300BBIIWM
2006, Bidt

Test result of Main Meter

Percentage error of meter : 0.046 % (for Kwh)
(√ Error found within permissible limits)
Instantaneous Parameters at the Time of Testing

Voltage Ph-N in Volt			Current in mA			P.F.	Active Power in W
R	Y	B	R	Y	B		
64.10	64.09	63.89	221.51	220.41	197.93	-0.999	-37.80

Check Meter Details :
Make : L & T
Amp : -/1A
Voltage : (3 x 63.5V)
Class Accuracy : (0.2s)
Imp/Unit : 50000
Sl. No. : 06605009
WR300BBIIWM
2006, Bidt

Test result of Check Meter

Percentage error of meter : 0.123 % (for Kwh)
(√ Error found within permissible limits)
Instantaneous Parameters at the Time of Testing

Voltage Ph-N in Volt			Current in mA			P.F.	Active Power in W
R	Y	B	R	Y	B		
63.91	63.72	63.710	231.41	230.51	201.41	-0.998	36.90

Appendix 3:

Final summary of CoUs claim under this monitoring period:

	Year	Net MWH	Net CoU	Final CoUs considered	Remarks
	2014	2,239.1648	2,015.25	2,015	Final for the vintage
	2015	2,850.2742	2,565.25	2,565	Final for the vintage
	2016	2,460.9236	2,214.83	2,214	Final for the vintage
	2017	2,280.5071	2,052.46	2,052	Final for the vintage
	2018	2,241.9631	2,017.77	2,017	Final for the vintage
	2019	2,237.2350	2,013.51	2,013	Final for the vintage
	2020	2,162.1700	1,945.95	1,945	Final for the vintage
	2021	2,120.6001	1,908.54	1,908	Final for the vintage
	2022*	597.5508	537.80	537	Final for the vintage
Total =		19,190.3887	17,271	**17,266**	**Total claimed**
Annual avg. =		2,132.27	1,919.04	1,918.00	Average

Comparison with Ex-ante estimate		
Ex-ante estimated value as per UCR PCN =	1,971	CoUs/year
Ex-ante comparative value during the current monitoring period =	16,594	CoUs
Actual COUs achieved during the current monitoring period =	17,266	CoUs
Variation in CoUS =	4.05%	Fraction