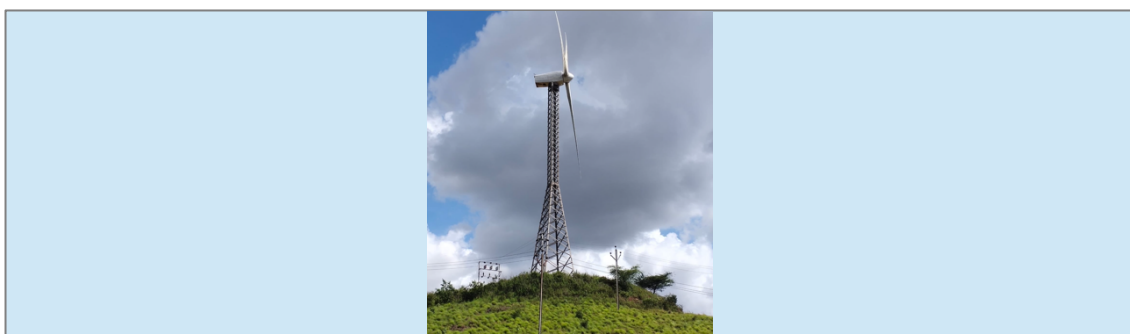




PROJECT CONCEPT NOTE

CARBON OFFSET UNIT (CoU) PROJECT



Title: 14.2 MW Wind Project in Karnataka

Version 1.0

Date 02/08/2022

First CoU Issuance Period: 8 years, 5 months

Date: 01/01/2014 to 30/09/2022



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

BASIC INFORMATION

Title of the project activity	14.2 MW Wind Project in Karnataka
Scale of the project activity	Small Scale
Completion date of the PCN	02/08/2022
Project participants	M/S V.S. Lad & Sons
Host Party	INDIA
Applied methodologies and standardized baselines	AMS-1. D – Grid Connected Renewable Electricity Generation V.18.0
Sectoral scopes	01 Energy industries (Renewable/NonRenewable Sources)
Estimated amount of total GHG emission reductions	25,746 CoUs (25,746 tCO _{2eq})

SECTION A. Description of project activity

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

The proposed project activity involves construction and operation of 4 small-scale wind turbine generator project by V. S. Lad & Sons (VSL) in different districts of the state of Karnataka in India. These sites have been identified as ideally suited for wind power generation as per the micro siting studies and data analysis based on annual wind speed and frequency distribution.

The project activity has been essentially conceived to generate clean energy by utilizing the wind energy. It causes total minimum environmental impacts and in turn will lead to 25,746 tCO₂e/yr reduction of greenhouse gas (GHG) emissions per year.

Total cumulative installed capacity of the project would be 14.2 MW with an annual gross energy generation of 28,608 MWh. The Small-Scale wind power projects developed by V. S. Lad & Sons, will deliver electricity to the buyer, through National transmission network.

The details of the registered project are as follows:

Project	IPP	Capacity	Location	Annual Net Generation	Emission Reduction	Commissioned Date	PPA
1.2 MW Wind Power Project in Davangere.	V. S. Lad & Sons	1.2 MW	Davangere district, Karnataka	2,417 MWh	2,175 tCO ₂ e/yr	31/03/2006	MESCOM
6.25 MW Wind Power Project in Gadag.	V. S. Lad & Sons	6.25 MW	Gadag district, Karnataka	12,592 MWh	11,333 tCO ₂ e/yr	10/08/2006	HESCOM
3.0 MW Wind Power Project in Chitradurg.	V. S. Lad & Sons	3.0 MW	Chitradurg district, Karnataka	6,044 MWh	5,439 tCO ₂ e/yr	28/03/2008	BESCOM
3.75 MW Wind Power Project in Bellary.	V. S. Lad & Sons	3.75 MW	Bellary district, Karnataka	7,555 MWh	6,799 tCO ₂ e/yr	30/09/2005	MESCOM

Proposed wind power project has evolved as a result of the policies of Government of India and Government of Karnataka, which encourages energy development from renewable sources. These policies have given fresh impetus to wind power generation.

The electricity produced by the project is directly contributing to climate change mitigation by reducing the anthropogenic emissions of greenhouse gases into the atmosphere by displacing an equivalent amount of power at grid.

Since the project activity will generate 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.

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

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

Rational: As per 'Central Pollution Control Board (Ministry of Environment & Forests, Govt. of India)', final document on revised classification of Industrial Sectors under Red, Orange, Green and White Categories (07/03/2016), it has been declared that wind project activity falls under the "White category". White Category projects/industries do not require any Environmental Clearance such as 'Consent to Operate' from PCB as such project does not lead to any negative environmental impacts. Additionally, as per Indian Regulation, Environmental and Social Impact Assessment is not required for Wind Projects. There are social, environmental, economic and technological benefits which contribute to sustainable development. The key details have been discussed in the previous section

Social benefits:

- Social well-being is assessed by contribution by the project activity towards improvement in living standards of the local community.
- The project activity has resulted in increased job opportunities for the local population on temporary and permanent basis.
- Manpower was required both during erection and operation of the wind farms. This has resulted in poverty alleviation of the local community and development of basic infrastructure leading to improvement in living standards of the local population

Environmental benefits:

- The project utilizes wind energy for generating electricity which otherwise would have been generated through alternate fuel (most likely - fossil fuel) based power plants, contributing to reduction in specific emissions (emissions of pollutant/unit of energy generated) including GHG emissions.
- As wind power projects produce no end products in the form of solid waste (ash etc.), they address the problem of solid waste disposal encountered by most other sources of power.
- Being a renewable resource, using wind energy to generate electricity contributes to resource conservation. Thus, the project causes no negative impact on the surrounding environment.

Economic benefits:

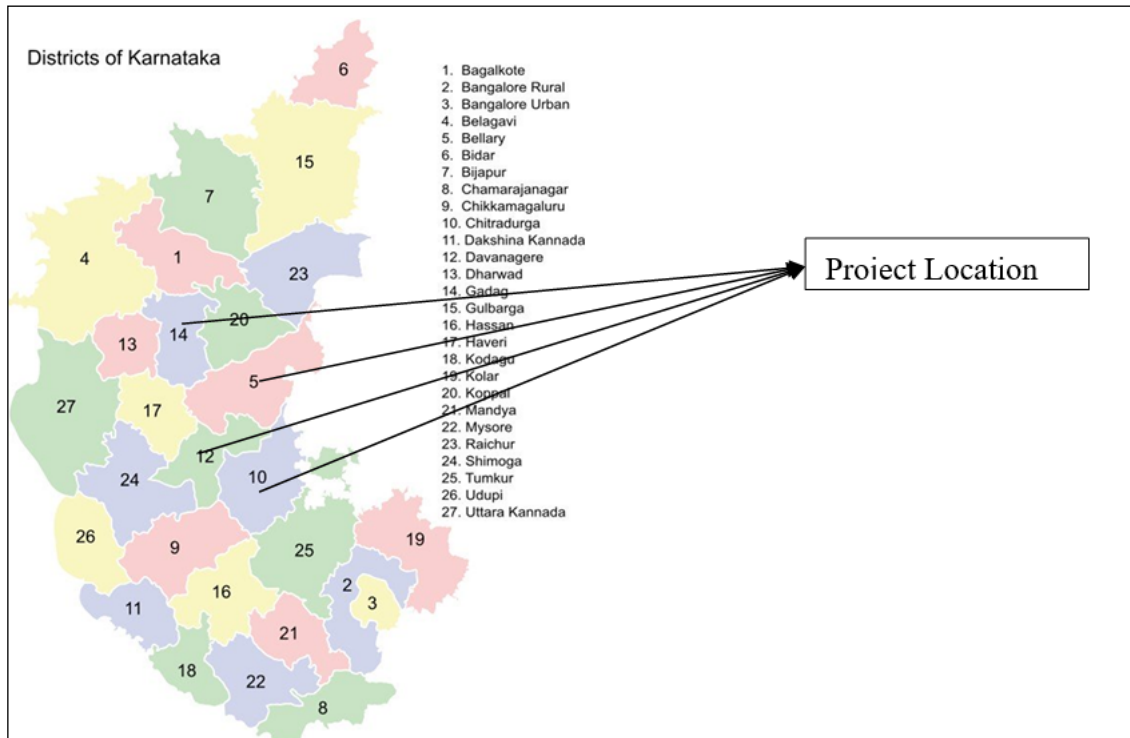
- The project activity has created direct and indirect job opportunities to the local community during installation and operation of the WEGs.
- The investment for the project activity has increased the economic activity of the local area.
- The project activity also contributes in economic well-being of the nation's economy by reducing import of fossil fuel for electricity generation in hard currency

A.3. Location of project activity >>

The Projects are located in the state of Karnataka, India.

	1.2 MW	6.25 MW	3 MW	3.75 MW
Country	India	India	India	India
District	Davangere	Gadag	Chitradurg	Bellary
Village	Kumabaluru	Kalkeri	Kolalu	Nagtibassapur & shivallinganhalli
Tehsil	Honnali	Mundaragi	Holalkere	Huvaina Hadagali
State	Karnataka	Karnataka	Karnataka	Karnataka
Code	577530	586118	577533	583219

Project	Latitude	Longitude
1.2 MW Wind Power Project in Davangere.	14° 15' 27.3"	75° 46' 23.7"
	14° 15' 21.1"	75° 46' 23.4"
6.25 MW Wind Power Project in Gadag.	15° 08' 48.3"	75° 48' 14.6"
	15° 08' 18.4"	75° 48' 34.0"
	15° 08' 13.7"	75° 48' 38.3"
	15° 08' 10.3"	75° 48' 43.8"
	15° 08' 04.9"	75° 48' 48.4"
3.0 MW Wind Power Project in Chitradurg.	14° 03' 14.6"	76° 26' 18.9"
	14° 03' 00.3"	76° 26' 19.3"
3.75 MW Wind Power Project in Bellary.	14° 58' 12.0"	75° 54' 39.3"
	14° 58' 06.6"	75° 54' 43.5"
	14° 58' 01.4"	75° 54' 47.7"



A.4. Technologies/measures >>

The project activity will implement Horizontal axis wind turbines. The Wind Turbine Generators (WTGs) comprising the project activity will generate clean green power which will be exported to the grid through the receiving station of KPTCL. The project will house the metering, switchgear and other protection equipment within the wind farms.

PPAs are intended to be signed with the Distribution Company (DISCOM) for a term of 10 years, extendable by another term of 10 years if the KERC determined tariff from the eleventh year onwards is acceptable to the DISCOM. The technology provider will provide operational training for the plant personnel, along with operation and maintenance service at least for the first two years of the project activity. WTGs are manufactured as per stringent European quality standards in accordance with Indian climatic conditions. All the WTGs are three bladed active stalls regulated.

Salient features of WTG to be used in the project activity are:

- ISO 9001 Certificate for Design and Manufacture; ISO 9001:2000 for Installation & Commissioning and for Operation & Maintenance.
- Approved by Ministry for new and renewable energy (MNRE)
- Suitable for India's harsh climatic conditions prevailing at remote locations.
- Improved Power factor
- Improved power curve for operation under low wind conditions
- Carefully devised electrical system to withstand erratic grid connections.
- Integrated Power transmission mechanism.
- High Performance Rotor blades.
- Dual speed asynchronous generator.
- Microprocessor based fully automatic control system with user friendly operation and central monitoring system.
- Quality, Safety and Health plan for construction, installation, commissioning and Operation & Maintenance.
- Microprocessor controlled high efficiency soft start.
- Active Yaw gear drives incorporating hydraulic yaw brakes.

Specifications	1.2 MW	6.25 MW	3 MW	3.75 MW
Tower / Rotor Height	50 m	56 m	78.5	56m
Rotor Diameter	47 m	66 m	82 m	66m
Annual generation of individual WTGs as per the guaranteed generation	2,417 MW	12,592 MW	6,044 MW	7,555 MW
Cut-in wind speed	4 m/s	3 m/s	4 m/s	3 m/s
Rated wind speed	15 m/s	14 m/s	12.5 m/s	14 m/s
Cut-out wind speed	25 m/s	25 m/s	20 m/s	25 m/s
Rotor swept area	1735.16 m ²	3421.19 m ²	5281 m ²	3421.19 m ²

Rotor material Blades material	High Tensile Angles	GRP	GRP	GRP
Generator				
Rated output	600 kW	1250 kW	1500 kW	1250 kW
Rotational speed at rated power	1527 rpm	1515 rpm	1511RPM	1515 rpm
Operating voltage	690 V	690 V	690 V	690 V
Frequency	50 Hz	50 Hz	50 Hz	50 Hz
Gear ratio	1:58.2	1:75.917	1:95.09	1:75.917

A.5. Parties and project participants >>

Party (Host)	Participants
India	V. S. Lad & Sons

A.6. Baseline Emissions>>

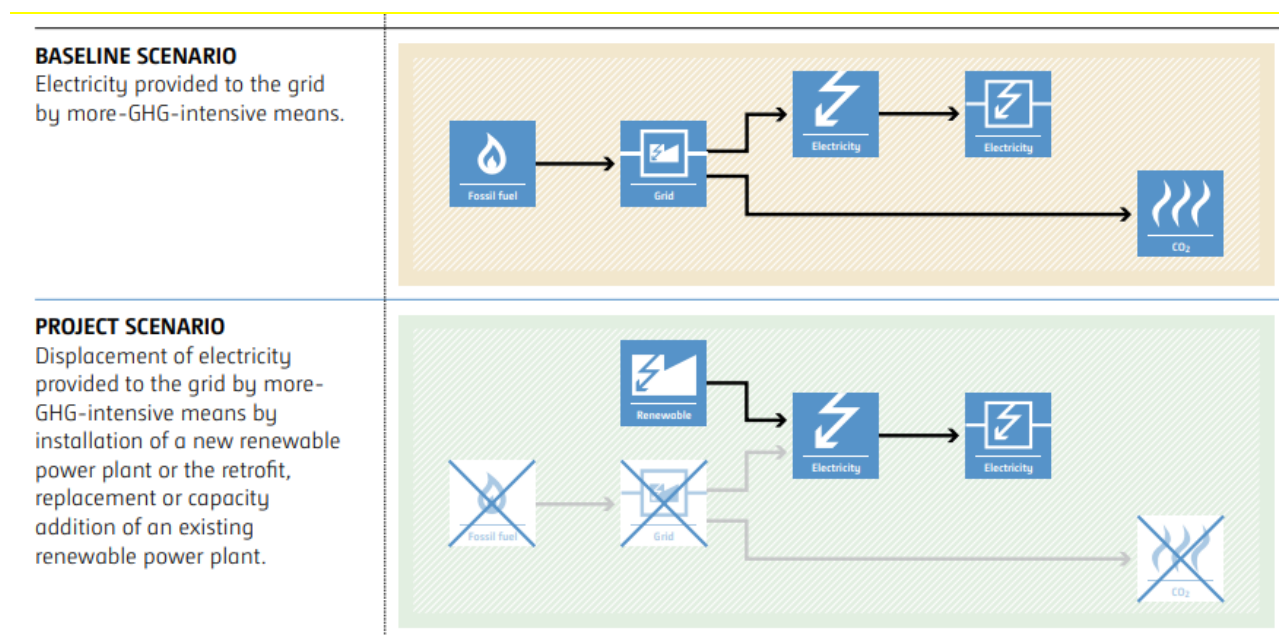
As per para 19 of AMS I.D, “The baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid”.

The project activity is greenfield grid-connected electricity generation from wind energy sources. According to the description in the approved baseline methodology, for the project activities that do not modify or retrofit an existing electricity generation facility,

As per para 22 of AMS I.D, “Baseline emissions include only CO₂ emissions from electricity generation in power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants.”

Hence, for the proposed project, the baseline emission will be the amount of electricity supplied to the grid multiplied by the grid emission co-efficient. Energy (electricity) generated by the wind turbines will be metered by VSL and KPTCL at the high voltage side of the step-up transformers installed at the receiving station. The energy fed in to the grid will be used to calculate the emission reductions and is measured in terms of kWh.

Estimation of the emission reductions due the project activity is equal to the amount of electricity supplied to the grid multiplied by the grid emission co-efficient.



A.7. Debundling>>

This 14.2 MW Wind Power project in Karnataka, India is not a de-bundled component of a larger project activity.

SECTION B. Application of methodologies and standardized baselines

B.1. References to methodologies and standardized baselines >>

SECTORAL SCOPE –01 Energy industries (Renewable/Non-renewable sources)

TYPE Renewable Energy Projects

CATEGORY- AMS-I.D. “Grid connected renewable electricity generation” Version-18.0

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

The project activity involves generation of grid connected electricity from the construction and operation of a new wind power-based power project. The project activity has installed capacity of 3 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 18.0 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	All the project activities involve setting up of a renewable energy (Wind) generation plant that exports electricity to the fossil fuel dominated electricity grid (Indian Grid system). Thus, the project meets this applicability conditions “a”.
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 Indian Grid system grid which is a regional grid, the methodology AMS-I.D. is applicable.
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 Wind 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).
4. Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: (a) The project activity is implemented in existing reservoir, with no change in the volume of the reservoir; or (b) The project activity is implemented in existing reservoir, where the volume of the reservoir(s) is	Project is a Wind Power plant hence this criteria is not applicable

increased and the power density as per definitions given in the project emissions section, is greater than 4 W/m ² . (c) The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than 4 W/m ²	
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.	Not relevant as there is no non-renewable components involved in the project.
6. Combined heat and power (co-generation) systems are not eligible under this category	This is not relevant to the project activity as the project involves only wind power generating units.
7. In the case of project activities that involve the capacity addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	There is no other existing renewable energy power generation facility at the project site. Therefore, this criterion is not applicable.
8. In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement power plant/unit shall not exceed the limit of 15 MW.	The project activity is a new installation, it does not involve any retrofit measures nor any replacement and hence is not applicable for the project activity.
9. In the case of landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered methane emissions are eligible under a relevant Type III category. If the recovered methane is used for electricity generation for supply to a grid, then 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.
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.

B.3. Applicability of double counting emission reductions >>

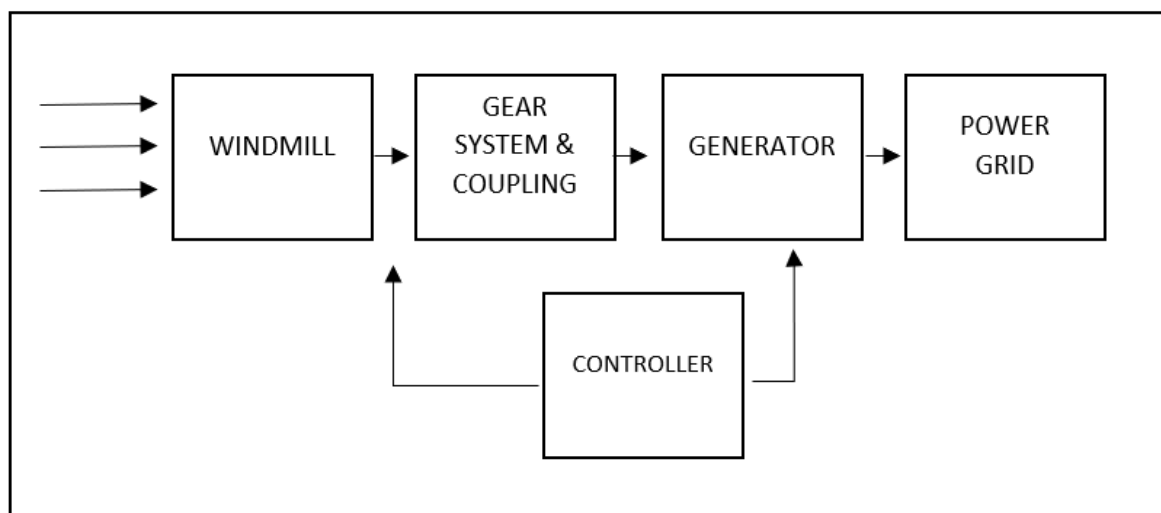
There is no double accounting of emission reductions in the project activity due to the following reasons:

- 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 consumption point for project developer.

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

As per applicable methodology AMS-I.D. Version 18.0, “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 and the Indian grid system.



Scenario	Source	GHG	Included?	Justification/Explanation
Baseline	Electricity generation in fossil fuel fired power that is dispatched due to the project activity	CO2	Yes	Main emission source
		CH4	No	Not identified in the baseline methodology
		N2O	No	Not identified in the baseline methodology
Project Activity	Electricity generation in the project activity	CO2	No	Zero-emissions grid connected electricity generation from renewable energy
		CH4	No	Zero-emissions grid connected electricity generation from renewable energy
		N2O	No	Zero-emissions grid connected electricity generation from renewable energy

B.5. Establishment and description of baseline scenario (UCR Standard or Methodology) >> Emission Reductions

As per para 19 of the approved consolidated methodology AMS-I.D. Version 18.0, 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 i.e., India grid. In the absence of the project activity, the equivalent amount of power would have been generated by the operation of grid-connected fossil fuel-based power plants and by the addition of new fossil fuel-based generation sources into the grid. The power produced at grid from the other conventional sources which are predominantly fossil fuel based. Hence, the baseline for the project activity is the equivalent amount of power produced at the Indian grid.

A "grid emission factor" refers to a CO₂ emission factor (tCO₂/MWh) which will be associated with each unit of electricity provided by an electricity system. The UCR recommends an emission factor of 0.9 tCO₂/MWh for the 2014-2020 years as a fairly conservative estimate for Indian projects not previously verified under any GHG program. Also, for the vintage 2021, 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.

Net GHG Emission Reductions and Removals

$$ER_y = BE_y - PE_y - LE_y$$

Where:

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

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

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

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

Baseline Emissions

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

The baseline emissions are to be calculated as follows:

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

Where:

BE_y = Baseline emissions in year y (t CO₂)

EG_{PJ,y} = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of this project activity in year y (MWh)

EF_{grid,y} = UCR recommended emission factor of 0.9 tCO₂/MWh has been considered, this is conservative as compared to the combined margin grid emission factor which can be derived from

Database of Central Electricity Authority (CEA), India. (Reference: General Project Eligibility Criteria and Guidance, UCR Standard, page 4)

Project Emissions

As per paragraph 39 of AMS-I.D. (Version 18.0, dated 28/11/2014), for most renewable energy project activities emission is zero. Since, all the projects are run of river project and does not involve any reservoir, the project emission is zero.

Hence, PEy = 0

Leakage

As per paragraph 22 of AMS-I.D. version-18.0, '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, LEy = 0

The actual emission reduction achieved during the first CoU period shall be submitted as a part of first monitoring and verification. However, for the purpose of an ex-ante estimation, following calculation has been submitted:

1.2 MW Wind Power Project in Davangere

Estimated annual baseline emission reductions (BEy)

$$\begin{aligned} &= 2,417 \text{ MWh/year} \times 0.9 \text{ tCO}_2/\text{MWh} \\ &= 2,175 \text{ tCO}_2/\text{year (i.e., 2,175 CoUs/year)} \end{aligned}$$

6.25 MW Wind Power Project in Gadag

Estimated annual baseline emission reductions (BEy)

$$\begin{aligned} &= 12,592 \text{ MWh/year} \times 0.9 \text{ tCO}_2/\text{MWh} \\ &= 11,333 \text{ tCO}_2/\text{year (i.e., 11,333 CoUs/year)} \end{aligned}$$

3.0 MW Wind Power Project in Chitradurg

Estimated annual baseline emission reductions (BEy)

$$\begin{aligned} &= 6,044 \text{ MWh/year} \times 0.9 \text{ tCO}_2/\text{MWh} \\ &= 5,439 \text{ tCO}_2/\text{year (i.e., 5,439 CoUs/year)} \end{aligned}$$

3.75 MW Wind Power Project in Bellary

Estimated annual baseline emission reductions (BEy)

$$\begin{aligned} &= 7,555 \text{ MWh/year} \times 0.9 \text{ tCO}_2/\text{MWh} \\ &= 6,799 \text{ tCO}_2/\text{year (i.e., 6,799 CoUs/year)} \end{aligned}$$

Project	Net Generation (MWh/year)	Emission Factor (tCO ₂ /MWh)	Emission Reduction (tCO ₂ /year)
1.2 MW Wind Power	2,417	0.9	2,175

Project in Davangere.			
6.25 MW Wind Power Project in Gadag.	12,592	0.9	11,333
3.0 MW Wind Power Project in Chitradurg.	6,044	0.9	5,439
3.75 MW Wind Power Project in Bellary.	7,555	0.9	6,799
Total	28,608		25,748

B.6. Prior History>>

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

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

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

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

Not Applicable

B.9. Monitoring period number and duration>>

First Issuance Period: 8 years, 9 months – 01/01/2014 to 30/09/2022

B.8. Monitoring plan>>

As per the law applicable and implemented in practice, the delivered energy shall be metered by VSL and KPTCL at the high voltage side of the step-up transformers installed at the receiving station. The energy metering equipment shall be electronic trivector meters, which is required for the project. The energy metering equipment shall be maintained in accordance with electricity standards and have the capability of recording half hourly and monthly readings, which in turn are produced to KPTCL. The energy meters installed would be capable of recording and storing the parameters for a minimum period of 35 days with digital output. The energy meter readings at the project sites and the receiving station will be taken simultaneously and jointly by both the parties. The recorded metering data shall be downloaded through meter recording instrument.

Apart from the joint (KPTCL/DISCOM and VSL) main meter reading undertaken as per the law applicable and implemented in practice to the wind farm in the State of Karnataka, which is duly signed by the KPTCL/DISCOM representative together with a VSL representative, VSL will follow the provisions under the law applicable and implemented in practice to the wind farm in the State of Karnataka and PPA in case the primary measuring fails.

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(s) 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

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

Data / Parameter:	EG BL, y
Data unit:	MWh/year
Description:	Quantity of net electricity supplied to the grid as a result of the implementation of the project activity in year y (MWh)
Source of data:	Monthly Joint Meter Readings (JMRs)
Value(s) applied:	28,608 MWh
Measurement procedures (if any):	Data Type: Measured Monitoring equipment: Energy Meters are used for monitoring Recording Frequency: Continuous monitoring and Monthly recording from Energy Meters, Summarized Annually Archiving Policy: Paper & Electronic Calibration frequency: 5 years (as per CEA provision)
Monitoring frequency:	Monthly
QA/QC procedures:	Calibration of the Main meters will be carried out once in five (5) 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. Cross Checking: Quantity of net electricity supplied to the grid will be cross checked from the invoices raised by the project participant to the grid.
Any comment:	-