MONITORING REPORT

CARBON OFFSET UNIT (CoU) PROJECT

Title	**:**	12 MW Small-Scale Bundled Wind Power Project by M/s Shah Promoters and Developers.
Version	**:**	2.0
MR Date	**:**	03/07/2023
First CoU Issuance Period	**:**	10 Years
First Monitoring Duration	**:**	01/01/2013 to 31/12/2022

	Monitoring Report (MR) **CARBON OFFSET UNIT (CoU) PROJECT**
BASIC INFORMATION	
Title of the project activity	12 MW Small-Scale Bundled Wind Power Project by M/s Shah Promoters and Developers.
UCR Project Registration Number	164
Version	2.0
Completion date of the MR	03/07/2023
Monitoring period number and duration of this monitoring period	Monitoring Period Number: 01 Duration of this monitoring Period: 10 Years (First and last days included (01/01/2013 to 31/12/2022)
Project participants	Creduce Technologies Private Limited (Aggregator) M/s Shah Promoters and Developers. (Project Owner)
Host Party	India
Applied methodologies and standardized baselines	Applied Baseline Methodology: AMS-I. D: "Grid connected renewable electricity generation", version 18
Sectoral Scope	01 Energy industries (Renewable/Non-Renewable Sources)
	2013 : 19,366 CoUs (19,366 tCO_2e) 2014 : 17,978 CoUs (17,978 tCO2e) 2015 : 17,710 CoUs (17,710 tCO2e) 2016 : 14,377 CoUs (14,377 tCO2e) 2017 : 16,244 CoUs (16,244 tCO2e) 2018 : 17,436 CoUs (17,436 tCO2e) 2019 : 17,868 CoUs (17,868 tCO2e) 2020 : 15,587 CoUs (15,587 tCO2e) 2021 : 17,337 CoUs (17,337 tCO2e) 2022 : 17,592 CoUs (17,592 tCO2e)
Total:	1,71,495 CoUs (1,71,495 tCO_2e)

SECTION - A - Description of project activity

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

The proposed project activity with title under UCR "12 MW Small-Scale Bundled Wind Power Project by M/s Shah Promoters and Developers." (Herein after called as project proponent 'PP') in Maharashtra is a grid-connected renewable power generation activity which incorporates installation and operation of 15 Wind Turbine Generators (WTGs) having capacity 12 MW, manufactured and supplied by Enercon (India) Limited. in the district Satara of the state of Maharashtra in India. The project is an operational activity with continuous reduction of GHG, currently being applied under "Universal Carbon Registry" (UCR).

A.1.1 Purpose of the project activity:

The project activity aims to harness the kinetic energy of wind (a renewable source) to generate electricity. The net generated electricity from the project activity is being sold through NEWNE grid as Power Purchase Agreement signed between Maharashtra State Electricity Distribution Company Ltd (MSEDCL). i.e., state discom. Currently, the NEWNE grid is connected to large numbers of fossil fuel-based power plants. Hence, project activity is displacing the gross electricity generation i.e., 1,90,554 MWh from the NEWNE grid, which otherwise would have been imported from the NEWNE grid.

The proposed project activity of 12 MW was installed in two phases and operation of Wind Turbine Generators in Satara district in the state of Maharashtra are per details listed below:

Site	Taluka	District	Total Installed Capacity	Commissioning Date
Chavaneshwar	Koregaon	Satara	1 x 800	11/08/2011
Chavaneshwar	Koregaon	Satara	14 x 800	31/03/2011

The project activity doesn't involve any GHG emission sources. The annual and the total CO_2e emission reduction by the project activity over the defined monitoring period is as per **Annexure I.**

A.1.2 Description of the installed technology and equipment:

The project activity involves 15 wind turbine generators (WTGs) having a total capacity of 12 MW manufactured and supplied by Enercon (India) Limited. The average life of the generator is around 20 years as per the equipment supplier's specification. The other salient features of the technology are:

The wind turbine is used to produce electricity using the kinetic energy of the wind. This is transformed into electrical energy using wind turbines or wind energy conversion systems. Wind first hits a turbine's blades, causing them to rotate and turn the turbine connected to them. That changes the kinetic energy to rotational energy, by moving a shaft which is connected to a generator, and thereby producing electrical energy through electromagnetism.

Below is a description of the different components of a Wind Turbine Generator.

1. **Main Tower:** The main support tower is made of steel, finished in a number of layers of protective paint to shield it against the elements. The tower is tall enough to ensure the rotor blade does not interfere with normal day-to-day operations at ground level.
2. **Rotor Blades:** The rotor blades are the three (usually three) long thin blades that attach to the hub of the nacelle. These blades are designed to capture the kinetic energy in the wind as it passes, and convert it into rotational energy.
3. **Nacelle:** The nacelle is the 'head' of the wind turbine, and it is mounted on top of the support tower. The rotor blade assembly is attached to the front of the nacelle. It contains all the major parts of the WEG.
4. **Hub:** The hub of the wind turbine is the component that connects the blades to the main shaft and ultimately to the rest of the tower. The hub transmits and withstands all the loads generated by the blades.
5. **Main Shaft:** It is a piece of metal in the form of a tube that constitutes the most important spinning constituent since it conveys the energy from the wind turbine blades to the other parts of the wind turbine.
6. **Gear Box:** A gearbox is often used in a wind turbine to increase the rotational speed from a low-speed main shaft to a high-speed shaft connecting with an electrical generator. Gears in wind turbine gearboxes are subjected to severe cyclic loading due to variable wind loads that are stochastic in nature.
7. **Brake:** A wind turbine rotor brake is a brake placed next to the gearbox that reduces the rotational speed of the blade assembly, fixes the blade so that it does not rotate in the case of power transmission maintenance or power generator rest, and in an emergency.
8. **Turbine generator:** The turbine generator is the component that turns the rotational energy in the high-speed output shaft from the gearbox into an electrical current. The electrical principle of electromagnetic induction shows that while a magnet is moving past a coil of wire, an electric current is created (or "induced") in the wire.

A.1.3 Relevant dates for the project activity (e.g., construction, commissioning, continued operation periods, etc.)

The duration of the crediting period corresponding to the monitoring period is covered in this monitoring report.

UCR Project ID	:	**164**
Start Date of Crediting Period	:	01/01/2013
The project was commissioned on	:	Mentioned in Section A.1

A.1.4 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 are as follows:

Summary of the Project Activity and ERs Generated for the Monitoring Period

Start date of this Monitoring Period	01/01/2013
Carbon credits claimed up to	31/12/2022
Total ERs generated (tCO_2e)	1,71,495 tCO_2e
Leakage Emission	0
Project Emission	0

A.1.5 Baseline Scenario

As per 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".**

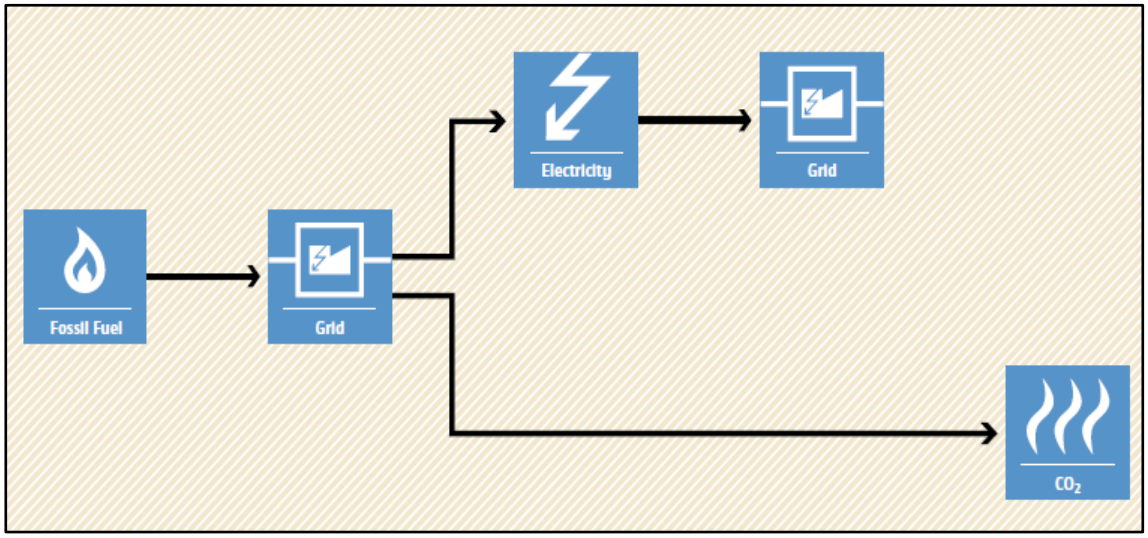


Figure 1 Baseline Scenario

A.2 Location of Project Activity

The project location is situated at Satara district in the state of Maharashtra. The nearest airport is in Pune. The project site is well connected by district and village roads to the nearest town.The geographic co-ordinates of the project location and Latitude & Longitude of each Wind Turbine is mentioned below:

Turbine ID	Turbine SL No	Turbine GPS Coordinates		Turbine Location
		Latitude	Longitude	
SPDCV-24	531389	17°47'3.522" N	74°07'36.108" E	Dhumalwadi, Koregaon, Satara, Maharastra
SPDCV-23	531388	17°47'6.876" N	74°07'34.428" E	Dhumalwadi, Koregaon, Satara, Maharastra

SPDCV-22	531380	17°47’10.29” N	74°07’33.318” E	Dhumalwadi, Koregaon, Satara, Maharastra
SPDCV-21	531379	17°47’27.45” N	74°07’31.26” E	Kolvadi, Koregaon, Satara, Maharastra
SPDCV-20	531387	17°47'31"N	74°7'30"E	Kolvadi, Koregaon, Satara, Maharastra
SPDCV-19	531381	17°47'36.9"N	74°7'32.736"E	Ambewade (K), Koregaon, Satara, Maharastra
SPDCV-18	484334	17°47'40.71"N	74°7'33.69"E	Ambewade (K), Koregaon, Satara, Maharastra
SPDCV-17	484333	17°47'44.982"N	74°7'34.206"E	Ambewade (K), Koregaon, Satara, Maharastra
SPDCV-16	531384	17°47'49.092" N	74°7'34.932" E	Ambewade (K), Koregaon, Satara, Maharastra
SPDCV-15	531382	17°47'53.706"N	74°7'34.746"E	Ambewade (K), Koregaon, Satara, Maharastra
SPDCV-14	531378	17°47'58.362"N	74°7'35.154"E	Ambewade (K), Koregaon, Satara, Maharastra
SPDCV-13	531383	17°48'2.922"N	74°7'35.748"E	Ambewade (K), Koregaon, Satara, Maharastra
SPDCV-12	531376	17°48'07"N	74°07'35"E	Palshi, Koregaon, Satara, Maharastra
SPDCV-11	531386	17°48'9.462"N	74°7'31.836"E	Palshi, Koregaon, Satara, Maharastra
SPDCV-10	531377	48'12.804"N	74°7'28.482"E	Palshi, Koregaon, Satara, Maharastra

The representative location map is included below:

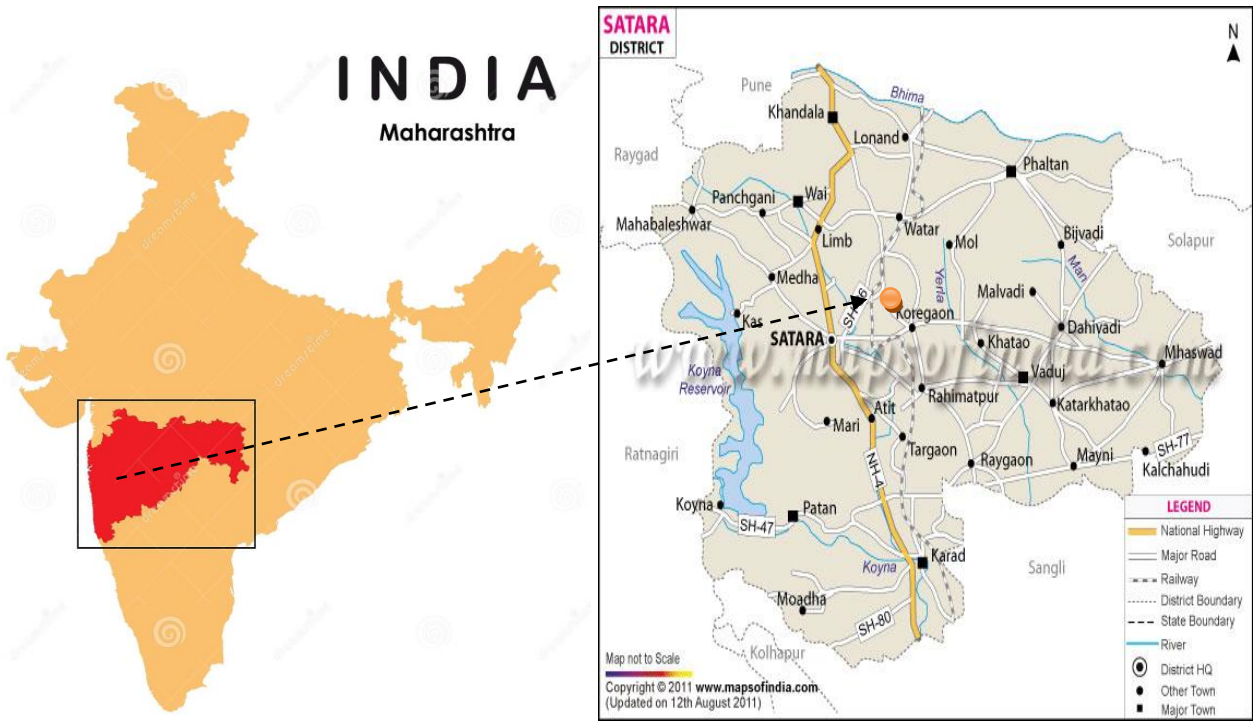


Figure-1- Location of the project activity (courtesy: google images and www.mapofindia.com)

A.3 Parties and project participants

Party (Host)	Participants
India	**Creduce Technologies Private Limited (Aggregator)** **Contact person** : Shailendra Singh Rao **Mobile** : +91 9016850742, 9601378723 **Address** : 2-O-13,14 Housing Board Colony, Banswara, Rajasthan -327001, India **M/s Shah Promoters and Developers. (Owner)** Address: AST-1, Success Chamber,1232, Apte Road, Deccan Gymkhana, Pune - 411004

A.4 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

A.5 Crediting period of project activity

Start date of the crediting period: 01/01/2013

Crediting period corresponding to this monitoring period: 10 Years

01/01/2013 to 31/12/2022 (Both dates are inclusive)

A.6 Contact information of responsible persons/entities

Contact person	**:**	**Shailendra Singh Rao**
Mobile	:	+91 9016850742, 9601378723
Address	:	2-O-13,14 Housing Board Colony, Banswara, Rajasthan -327001, India

SECTION - B - Implementation of project activity

B.1 Description of implemented registered project activity

B.1.1 Provide information on the implementation status of the project activity during this monitoring period in accordance with UCR PCN

The project consists of 15 WTGs with a capacity of (15*0.8MW) 12 MW which was implemented and commissioned by the Maharashtra state Energy Distribution Company Ltd. (MSEDCL), Government of Maharashtra at District Satara, Maharashtra. M/s Shah Promoters and Developers. is the owner of this project. The project generates clean energy by utilizing the kinetic energy of wind.

B.1.2 For the description of the installed technology, technical process, and equipment, include diagrams, where appropriate

The project activity involves 15 Wind Turbine Generators which is manufactured and supplied by Enercon (India) Limited. with an installed capacity of 12 MW. The connectivity of the WTGs is to a central Monitoring Station (CMS) through a high-speed WLAN modem or fiber optic cable which helps in providing real-time status of the turbine at CMS with easy GUI (Graphical User Interface) and the ability to monitor the functioning of the turbine from CMS. The life of the WTGs is 20 years as per manufacturer specifications.

Technical details of 800 kW WTG machine manufactured by Enercon (India) Limited. are as follows:

Turbine model	Enercon (India) Limited (E- 53)
Rated power	800 kW
Rotor diameter	52.9 m
Hub height	75 m
Turbine Type	Direct driven, horizontal axis wind turbine with variable rotor speed
Power regulation	Independent pitch system for each blade
Cut in wind speed	3 *m/s*
Rated wind speed	12 *m/s*
Cut-out Wind speed	34 m/s
Extreme Wind Speed	59.5 *m/s*
Rated rotational speed	29 rpm
Operating range rot. Speed	12-29 rpm
Orientation	Upwind
No of Blades	3
Blade Material	Fiber Glass Epoxy reinforced
Output Voltage	690 V
Tower Height	74 m (Concrete)

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

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

Rational: as per 'Central Pollution Control Board (Ministry of Environment & Forests, Govt. of India)', the final document on the revised classification of Industrial Sectors under Red, Orange, Green and White Categories (07/03/2016), 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 Regulations, Environmental and Social Impact Assessment is not required for Wind Projects.

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

Social well-being: The project would help in generating direct and indirect employment benefits accruing out of ancillary units for manufacturing towers for the erection of the wind turbine generator and for maintenance during the operation of the project activity. It will lead to the 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.

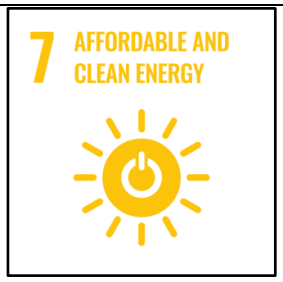
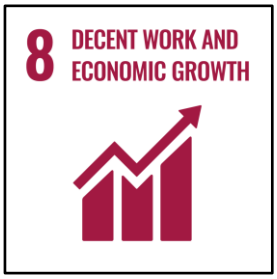
Environmental well-being: The project utilizes Wind energy for generating electricity which is a clean source of energy. The project activity will not generate any air pollution, wind pollution or solid waste to the environment which otherwise would have been generated through fossil fuels. Also, it will contribute to the reduction of GHG emissions. Thus, the project causes no negative impact on the surrounding environment contributing to environmental well-being.

Economic well-being: Being a renewable resource, using Wind energy to generate electricity contributes to the conservation of precious natural resources. The project contributes to economic sustainability through the promotion of decentralization of economic power, leading to the diversification of the national energy supply, which is dominated by conventional fuel-based generating units. Locally, improvement in infrastructure will provide new opportunities for industries and economic activities to be set up in the area. Apart from getting better employment opportunities, the local people will get better prices for their land, thereby resulting in overall economic development.

Technological well-being: The project activity leads to the promotion of a 12 MW WTGs in the region and will promote practice for small-scale industries to reduce the dependence on carbon-intensive grid supply to meet the selling requirement of electrical energy and also increase energy availability and improve quality of power under the service area. Hence, the project leads to technological well-being.

The project activity contributes to the following SDGs;

SDG	Description
Goal 7	➢ The project activity has generated 1,90,554 MWh of clean energy, which with increased shared will increase the affordability at a cheaper rate to end user. ➢ The project activity will utilize Wind energy (renewal resource) to

	generate power. The project activity will increase the share of renewable resource-based electricity in global mix of energy consumption.
Goal 8 	➢ Decent work and economic growth. The project activity generates additional employment for skilled and unskilled, also the project situated in a remote area will provide employment opportunities to unskilled people from villages. Training on various aspects including safety, operational issues, and developing skill sets will also be provided to employees.
Goal 13 	➢ This 12 MW wind power project meets the SDG 13 goal by saving fossil fuel and producing clean energy. ➢ This project has avoided 1,71,495 tons of CO_2 emissions during this monitoring period. ➢ **SDG 13** on clean energy is closely related and complementary. ➢ In a greenfield project, electricity delivered to the grid by the project would have otherwise been generated by the operation of grid-connected power plants. Thereby the project activity reduces the dependence on fossil fuel-based generation units and as there are no associated emissions with this project it contributes to the reduction of greenhouse gases (GHG) emissions.

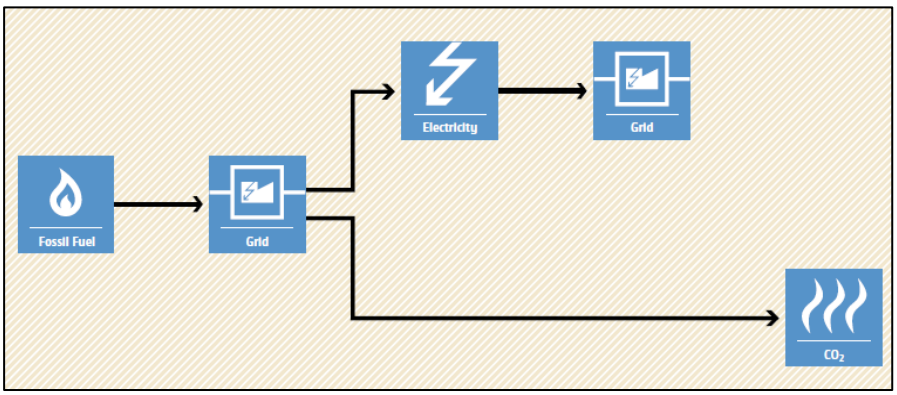
B.3 Baseline Emissions

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

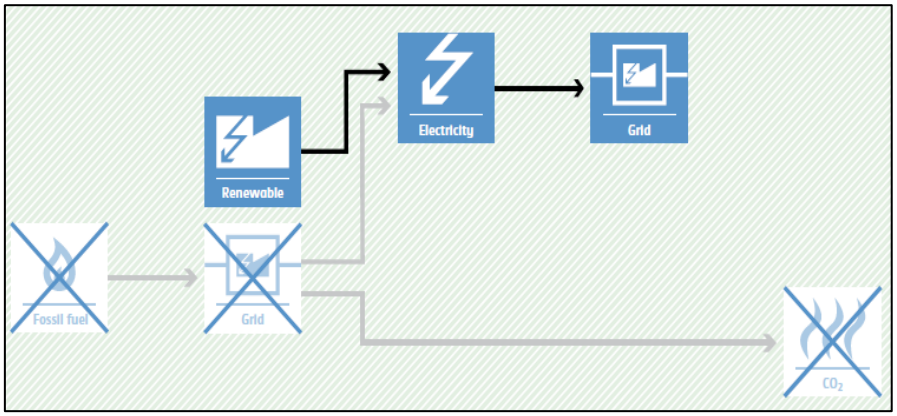
In the absence of the project activity, the equivalent amount of electricity would have been imported from the grid (which is connected to the unified Indian Grid system (NEWNE Grid)), which is carbon intensive due to being predominantly sourced from fossil fuel-based power plants. Hence, the baseline scenario of the project activity is the grid-based electricity system, which is also the pre-project scenario.

Schematic diagram showing the baseline scenario:

Baseline Scenario:



Project Scenario:



Thus, this project activity was a voluntary investment that replaced an equivalent amount of electricity from the Indian grid. The project proponent was not bound to incur this investment as it was not mandatory by national and sectoral policies. Thus, the continued operation of the project activity would continue to replace fossil fuel-based power plants and fight against the impacts of climate change. The PP hopes that revenues from the carbon credits generated will help repay the loans and help in the continued maintenance of this project activity.

B.4. De-bundling

This project activity is not a de-bundled 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 the generation of grid-connected electricity from the construction and operation of a new Wind Power based project for Selling electricity. A Power Purchase agreement is signed between M/s Shah Promoters and Developers. and Maharashtra State electricity Distribution Company Limited. (MSEDCL) i.e., state utility.

The project activity has an installed capacity of 12 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 the applicability of the 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 is a Renewable Energy Project i.e., a wind power project which falls under applicability criteria option 1 (a). i.e., Supplying electricity to a national or a regional grid
2. 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)/unit(s); or (e) Involve a replacement of (an) existing plant(s).	The option (a) of applicability criteria 2 is applicable as project is a Greenfield plant/unit. Hence the project activity meets the given applicability criterion.

3. 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 the existing reservoir, with no change in the volume of the reservoir; or b) The project activity is implemented in the existing reservoir, where the volume of the reservoir(s) is increased and the power density as per definitions given in the project emissions section, is greater than 4 W/m^2. c) The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than 4 W/m^2.	The project activity involves the installation of 12 MW WTGs; hence, this criterion is not applicable.
4. 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.	This project is a 12 MW Wind power project, i.e., the only component is a renewable power project below 15MW, thus the criterion is not applicable to this project activity.
5. Combined heat and power (co-generation) systems are not eligible under this category.	The project is a wind power project and thus, the criterion is not applicable to this project activity.
6. 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.	The project is a greenfield 12 MW wind power project, i.e., the only component is a renewable power project below 15 MW, thus the criterion is not applicable to this project activity.
7. In the case of retrofit, rehabilitation or replacement, to qualify as a small-scale project, the total output of the retrofitted, rehabilitated or replacement power plant/unit shall not exceed the limit of 15 MW.	The project is a greenfield 12 MW wind power project, i.e., the only component is a renewable power project below 15 MW, thus the criterion is not applicable to this project activity.
8. 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	The project is a greenfield 12 MW wind power project; hence, this criterion is not applicable to this project activity.

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.	
9. In case biomass is sourced from dedicate plantations, the applicability criteria in the tool "Project emissions from cultivation of biomass" shall apply.	No biomass is involved, the project is only a wind power project and thus the criterion is not applicable to this project activity.

C.3 Applicability of double counting emission reductions

The project was not applied under any other GHG mechanism. Hence the project will not cause double accounting of carbon credits (i.e., CoUs).

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." Thus, the project boundary includes the Wind Turbine Generator and the Indian grid system.

Source		Gas	Included?	Justification/Explanation
Baseline	Grid-connected 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 Electric 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 the baseline scenario

As per 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 WTGs to harness the wind energy and use it for Selling Purpose i.e., the Indian grid system through Power purchase agreement. 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 from 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) that 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 2013 - 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 the CEA database in India results in higher emissions than the default value. Hence, the same emission factor has been considered to calculate the emission reduction under a conservative approach.

C.5.1 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:

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

BE_y = Baseline emissions in year y (tCO_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 CDM 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)

Hence

Baseline Emissions Calculation				
Sr.No	Year	EGpy (MWh)	EFgrid,y	BEy
1	2013	21518.59	0.9	19,327
2	2014	19976.54	0.9	17,942
3	2015	19678.06	0.9	17,675
4	2016	15975.31	0.9	14,348
5	2017	18049.20	0.9	16,212
6	2018	19373.68	0.9	17436
7	2019	19854.16	0.9	17868
8	2020	17318.89	0.9	15587
9	2021	19263.34	0.9	17337
10	2022	19546.97	0.9	17592
11	BE (tCO_2e) for the period of 2013 to 2022			1,71,324

Estimated annual baseline emission reductions (BE_y)

= 1,90,554 MWh *0.9 tCO_2/MWh

= 1,71,495 tCO_2

- **Project Emissions**

As per Paragraph 39 of AMS-I.D. version-18, only emissions associated with fossil fuel combustion, emissions from the operation of geothermal power plants due to the release of non-condensable gases, emissions from a water reservoir of hydro should be accounted for the project emission. Since the project activity is a wind energy project, project emission for renewable energy plants is nil.

Thus, PE = 0

- **Leakage Emission**

As per paragraph 42 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 zero.

Hence, LE = 0

The actual emission reduction achieved during the first CoU period is calculated below:

Hence Net GHG emission reduction, = 1,71,495-0-0 = 1,71,495 tCO_2/year (i.e., 1,71,495 CoUs/year)

C.6 Prior History

The project activity is a bundle of wind machines. Following are the key details under the prior history of the project:

(a) The project was not applied under any other GHG mechanism. Hence project will not cause double accounting of carbon credits (i.e., COUs).

C.7 Changes to the start date of crediting

The crediting period under UCR has been considered from 01/01/2013.

C.8 Permanent changes from MR monitoring plan, applied methodology, or applied standardized baseline

Not applicable.

C.9 Monitoring period number and duration

Total Monitoring Period: 10 Years

Date: 01/01/2013 to 31/12/2022 (inclusive of both dates).

C.10 Monitoring Plan

The project activity essentially involves the generation of electricity from wind, the employed WTGs only converts wind energy into electrical energy and does not use any other input fuel for electricity generation, thus no special ways and means are required to monitor leakage from the project activity. The recording of the electricity fed to the state utility grid is carried out jointly at the incoming feeder of the state power utility (MSEDCL).

Data and Parameters available:

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 2013 - 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://cea.nic.in/wp-content/uploads/baseline/2023/01/Approved_report_emission__2021_22.pdf
Value applied	0.9

Measurement methods and procedures	-
Monitoring frequency	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 18, December 2022) results into higher emission factor. Hence for 2022 vintage UCR default emission factor remains conservative.

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

Data / Parameter	$EG_{PJ,facility, y}$
Data unit	MWh
Description	Net electricity supplied to the NEWNE grid facility by the project activity for power supplying between 01/01/2013 to 31/12/2022.
Source of data	Joint metering Report issued by Shah Promoters and developers & MSEDCL/MSETCL (Maharashtra State Electricity Distribution Company Limited)
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) The Net electricity generation by the WTGs is recorded at the sub-station. At the end of every month, MSEDECL credit note is generated based on the total monthly electricity exported to the grid.
Measurement Frequency:	Monthly
Value applied:	1,90,554 (Ex-post estimate)
QA/QC procedures applied:	Continuous monitoring, hourly measurement monthly recording. Tri-vector (TVM)/ABT energy meters with accuracy class 0.2s
Purpose of data:	The Data/Parameter is required to calculate the baseline emission.
Any comment:	Data will be archived electronically for a period of 36 months beyond the end of crediting period.

ANNEXURE I (Emission Reduction Calculation)

12 MW small-scale bundled wind power project by M/S Shah Promoters and Developers

Month - Wise Energy Delivered to Grid (in kWh)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2013	5,50,861	7,45,112	12,30,334	6,96,375	21,29,638	33,02,799	45,92,453	34,46,453	17,23,601	12,40,616	10,03,237	8,57,113
2014	7,15,561	9,16,931	11,23,913	10,43,966	11,08,887	34,58,673	45,44,003	20,64,668	20,28,742	9,41,181	10,94,818	9,35,201
2015	6,34,585	7,12,721	11,46,069	10,35,968	16,61,004	31,37,427	45,12,546	26,49,109	13,40,019	6,58,514	11,97,302	9,92,797
2016	6,61,610	3,34,692	7,08,241	7,34,391	21,17,949	21,15,414	20,41,407	21,52,677	17,92,620	10,29,571	10,38,181	12,48,555
2017	7,12,071	8,09,802	9,19,134	16,12,240	18,23,526	22,11,516	38,84,789	25,44,322	9,71,215	7,31,774	8,72,021	9,56,787
2018	5,68,463	5,70,642	7,77,449	11,76,368	14,35,468	24,62,925	40,10,719	41,58,322	13,16,084	10,15,213	9,00,333	9,81,693
2019	7,92,594	5,84,676	9,94,899	11,82,836	16,90,159	22,39,558	35,49,573	35,48,360	25,92,173	10,98,866	8,09,618	7,70,852
2020	7,41,669	8,49,568	11,20,704	10,72,748	14,80,990	19,82,180	22,72,812	37,65,211	8,04,395	8,32,631	14,07,870	9,88,114
2021	5,08,473	10,06,704	9,75,191	10,30,784	20,80,035	22,76,241	35,00,147	23,41,560	22,73,153	11,75,182	13,87,845	7,08,030
2022	8,19,697	6,57,679	11,09,025	9,41,825	27,06,663	20,41,024	33,17,034	31,22,671	15,17,145	10,65,312	13,68,923	8,79,975

Year-Wise Emission reduction calculation for the project activity

Year	Total No. of Electricity delivered in kWh	Recommended emission factor	Total CoUs generated
2013	21518590	0.9	19,366
2014	19976542	0.9	17,978
2015	19678059	0.9	17,710
2016	15975306	0.9	14,377
2017	18049197	0.9	16,244
2018	19373677	0.9	17,436
2019	19854163	0.9	17,868
2020	17318893	0.9	15,587
2021	19263343	0.9	17,337
2022	19546971	0.9	17,592
Total CoUs to be issued for the first monitoring period (Year: 2013 to 2022)			1,71,495