

# Guidelines for Development of Onshore Wind Power Projects

After detailed consultation with various stakeholders, The Ministry of New & Renewable Energy has, in the last quarter of 2016, finalized the Guidelines for Development of On Shore Wind Projects.

## Introduction

To ensure healthy and orderly growth of wind power sector in the country, the Ministry of New & Renewable Energy issued guidelines for development of wind power projects in 1995 and same were revised from time to time. In addition the Government has taken various initiatives to encourage wind power development in the country.

Most of the wind power development in India took place over the last 20 years and during this period the wind turbine technology has evolved from less efficient turbines with low capacity of 225 kW to more efficient turbines with high capacity of 3 MW being manufactured in India. Wind being intermittent in nature the large scale deployment of wind power has posed challenges on grid integration. The regulatory authorities have tightened regulations for grid integration of wind turbines.

Further, the Government has set an ambitious target of reaching 60 GW of wind power installed capacity in the country by 2022. To achieve the target the current rate of deployment of wind power capacity is required to be more than doubled.

With the technology development, new regulations and requirement of accelerated growth of wind power sector, it is felt to issue comprehensive guidelines for development wind power

projects in the country in consultation with various stakeholders.

## Objective

The objective of these guidelines is to facilitate the development of wind power projects in an efficient, cost effective and environmentally benign manner taking into account the requirements of project developers, State and national imperatives.

## Site Selection and Feasibility

The process of wind power project development starts with site selection. Identification of suitable sites depends upon land use permission, availability of wind resource, technically and commercially feasible grid connectivity, transport logistics and environmental acceptability.

(a) Land Use Permission: The project developer should ensure that the land being selected for the wind power project can be legally used for the purpose and all regulations regarding land use/land cover are complied with.

In case of allotment of land or land use permission given by State Government for the purpose of development of wind power project, a maximum period of 4 years may be allowed for development and start of commissioning of the project after allotment/permission to use land

given by the Government. If the project is not developed within the given time frame the land allotment/land use permission may be cancelled, however, extension may be granted for force majeure conditions.

For existing project developers, where land is already allotted or land use permission has been already given 18 months or higher, prior to issue of these guidelines may be given another 30 months subject to providing an undertaking that they are willing to develop and start commissioning of the project within stipulated period of 30 months.

(b) Availability of wind resource: The project developer is required to ensure the availability of wind resource at the site based on the various parameters measured for the purpose. The project developer is also required to ensure the quality of the data captured at a particular site for the correct assessment of the wind resource potential, project viability and sustainability of the project over the designed life time of the project.

In order to facilitate the wind industry, academia and research institution to analyse the wind power potential, the time series data from all the wind masts installed by NIWE through financial assistance from Government of India will be made



available by NIWE without charging any cost.

- (c) Technically and commercially feasible grid connectivity: The project developer should ensure that grid connectivity is technically and commercially feasible at the site selected.
- (d) Transport logistics: The project developer should ensure that components of the wind power project can be transported to the site selected with existing infrastructure and in case any addition is required the same would be created without any legal issues.
- (e) Environmental acceptability: If the site being selected falls in the area of forest land or in the vicinity of habitat of migratory birds and their flight routes, civil aviation, defence and heritage establishments the project

developer should ensure availability of necessary clearances from concerning authorities.

#### Type certification and quality assurance

Type certification is to confirm that the wind turbine type is designed, documented and manufactured in conformity with design assumptions, specific standards and other technical requirements. For manufacturers of wind turbines and components, type and quality certification by an Internationally Accredited Certification Body shall be a mandatory requirement. The wind turbine model shall possess a valid type certificate issued by any internationally accredited type certification body as per IEC /GL type certification scheme, along with certified power curve. The type certificate of the wind turbine model

should mandatorily include Hub and Nacelle assembly/manufacturing facility in India.

No wind turbine model shall be allowed for installation in the country until it has obtained type and quality certification as mentioned above. To facilitate SNAs, investors, lenders and developers, the Ministry of New and Renewable Energy will bring out the list of type and quality certified wind turbine models eligible for installation in the country. The list will be regularly updated by the MNRE through an online automated tracking and approval process.

#### Micrositing

Micrositing is the optimization of energy production through the correct placement of wind turbine generators in the wind farm area, considering all

physical constraints of the area. The optimized location of wind turbine generators (WTGs) may be computed by running an appropriate wind flow modelling, optimisation tools (linear and Non-linear) and techniques in any terrain conditions. The criteria for Micrositing shall be based on an optimised output rather than a strict mandated minimum distance between wind turbines. Micrositing criteria are prescribed as under;

- i. Developer(s) shall optimise the wind turbine locations within their land using appropriate wind flow modelling and optimisation tools (linear and Non- linear)/techniques subject to site assessment as per IEC 61400-1 standard for turbine safety considering extreme wind, flow inclination, vertical wind shear, and turbulence with added wake effects and corrections for terrain complexity etc.
- ii. Developer(s) shall maintain a distance of  $2 \times D$  (D-Rotor Diameter) distance perpendicular to the predominant wind direction and  $3 \times D$  distance in the pre- dominant wind direction from the boundary line of each adjoining land of other developer(s) with appropriate offset.
- iii. Developer(s) shall maintain a wake loss (in terms of energy) of 10% between wind turbines with appropriate offset for wind turbines sited on a foot print basis.
- iv. Developer(s) shall maintain a distance of  $HH + 1/2 RD + 5m$  (Hub Height+ Half Rotor Diameter +5 meters) from Public Roads, railway tracks, highways, buildings, public institutions and EHV lines.
- v. Developer(s) shall not site wind turbines within 500 m of any dwelling for the mitigation of noise

The above mentioned Micro siting techniques will also assist in repowering & intercropping as the investors / developers will have no constraints with minimum distances within the available

land ensuring optimised utilisation of the land with wind resource.

## Grid connectivity

For establishment of the evacuation arrangement and grid connectivity, the respective Electricity Regulatory Commission Order/Regulation shall be applicable.

## Compliance of Grid Regulations

Wind Turbine should be certified by an accredited certifying body for the compliance of the grid regulations including Active/Reactive power control, Low Voltage Ride Through (LVRT), power quality and other applicable requirements as per standards and regulations prescribed for the same by regulatory authorities.

## Metering and Real Time Monitoring

It shall be necessary for the project developer to install Availability Based Tariff (ABT) compliant meter with telecommunication facility at the pooling station/sub-Station to enable implementation of forecasting and scheduling regulation. It shall also be mandatory to communicate vital grid parameters on real time basis to respective Regional/State Load Despatch Centre.

## Online Registry and Performance Reporting of Wind turbines

An online registry of wind turbines

installed in the country will be created by NIWE. The wind project developer shall upload monthly performance report of the wind turbine on the web- portal created by NIWE for this purpose.

## Hybridization

Wind being intermittent in nature and having low CUF in comparison to conventional power, its hybridisation with other renewable and storage technologies would result in reduced intermittency and efficient utilisation of transmission infrastructure. The project developer may prudently use hybrid technologies in line with Policy issued by the Central/State Governments for this purpose.

## Repowering

Based on the improved wind turbine technology available the project developer may opt for repowering of the wind turbine as per Repowering Policy of the Central/State Governments.

## Decommissioning Plan

The proposal to establish wind power project should necessarily include decommissioning plan of the wind turbine after completion of its useful life. The NIWE will formulate guidelines for decommissioning of the wind turbines in consultation with stakeholders.

