Onshore Wind Power Project Development Guideline for Bangladesh, 2026

(Improved Draft)

Forward

Bangladesh stands at a critical juncture in its energy transition. With revised national targets of achieving 20% electricity generation from renewable sources by 2030 and 30% by 2040—as set out in the newly adopted Renewable Energy Policy, 2025—the rapid and responsible development of indigenous clean energy resources is both a necessity and an opportunity. Wind energy, though underexplored to date, offers a complementary and increasingly cost-competitive pathway alongside solar photovoltaics and other renewables.

This Guideline has been developed by the Sustainable and Renewable Energy Development Authority (SREDA) under the authority conferred by Section 27 of the SREDA Act, 2012, and in close consultation with stakeholders from the public sector, academia, private industry, financial institutions, civil society, and international development partners. It draws on globally established standards—including those of the International Electrotechnical Commission (IEC), the International Finance Corporation (IFC), and the Global Wind Energy Council (GWEC)—while being specifically calibrated to the legal, environmental, climatic, and socioeconomic conditions of Bangladesh.

The Guideline establishes a clear, transparent, and bankable framework for the development of land-based (onshore) wind power projects. It is intended to provide project developers, investors, lenders, government agencies, and communities with a single authoritative reference document that ensures technical robustness, financial viability, environmental responsibility, and community benefit.

This is a living document. SREDA is committed to revising and updating it as the sector matures, as new technologies emerge, and as Bangladesh's policy landscape evolves.

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Acronyms and Abbreviations

Term	Full Form
ABT	Availability-Based Tariff
AEP	Annual Energy Production
BERC	Bangladesh Energy Regulatory Commission
CBD	Convention on Biological Diversity
CFD	Computational Fluid Dynamics
CUF	Capacity Utilization Factor
DIA	Due Impact Assessment
DNV	Det Norske Veritas
DoE	Department of Environment (Bangladesh)
EIA	Environmental Impact Assessment
ERA	Environmental Risk Analysis
ESIA	Environmental and Social Impact Assessment
FCC	Final Clearance Certificate
GoB	Government of Bangladesh
GRS	Grievance Redress System
GWEC	Global Wind Energy Council
GL	Germanischer Lloyd
IA	Interconnection Agreement
IEC	International Electrotechnical Commission
IEE	Initial Environmental Examination
IFC	International Finance Corporation
IFS	Interconnection Feasibility Study
LoI	Letter of Intent
LVRT/HVRT	Low Voltage Ride Through / High Voltage Ride Through
MW / MWh / GWh	Megawatt / Megawatt-hour / Gigawatt-hour
NOC	No Objection Certificate
OPC	Optimum Plant Capacity
PPA	Power Purchase Agreement
RAP	Resettlement Action Plan
REHD	Renewable Energy Help Desk
SREDA	Sustainable and Renewable Energy Development Authority
WAsP	Wind Atlas Analysis and Application Program
WEHD	Wind Energy Help Desk
WTG	Wind Turbine Generator

Chapter 1: Introduction

1.2 Background and Policy Context

Wind energy is a clean, inexhaustible, and increasingly cost-competitive source of electricity. As a form of kinetic energy harvested from the movement of air masses, it is free from direct greenhouse gas emissions during operation and carries no fuel-price risk—characteristics of particular importance for an import-dependent economy such as Bangladesh.

Bangladesh possesses modest but commercially viable onshore wind resources, concentrated primarily along its 710-kilometre coastline, in the Chittagong Hill Tracts, and across selected open plain areas in the north-west. Detailed wind mapping carried out by SREDA and international partners has identified multiple sites with average annual wind speeds of 5.0–7.5 m/s at hub height—sufficient for utility-scale electrical power generation with modern turbine technology.

The Government of Bangladesh (GoB) has established an ambitious renewable energy target of 20% by 2030 and 30% by 2040 of total electricity generation from renewable sources under the Renewable Energy Policy 2025. Wind power, alongside solar and other renewables, is expected to contribute materially to this target. The Sustainable and Renewable Energy Development Authority (SREDA), established under the SREDA Act, 2012, is the designated authority responsible for planning, promoting, and regulating renewable energy development in Bangladesh.

This Guideline is issued by SREDA pursuant to Section 27 of the SREDA Act, 2012, following extensive stakeholder consultations. It applies to all privately developed or government-facilitated onshore wind power projects and is mandatory for project developers following the award of a project through the applicable procurement framework of the Power Division and the PPR 2025.

1.2 Scope and Applicability

This Guideline applies to all onshore wind power projects developed in Bangladesh regardless of project size, ownership structure, or financing modality. It covers the full project lifecycle, from initial site identification and feasibility assessment through design, permitting, construction, commissioning, operation, and eventual decommissioning.

1.3 Key Definitions

For the purposes of this Guideline, the following definitions shall apply:

Term	Definition
Project Developer	The legal entity that holds, or is seeking to hold, the right to develop, finance, construct, and operate a wind power project in Bangladesh. Also referred to as 'the Developer'.
Wind Turbine Generator (WTG)	A mechanical device that converts the kinetic energy of wind into electrical energy, comprising the tower, nacelle, hub, blades, and associated electrical and control systems.

IEC 61400-1	The International Electrotechnical Commission standard specifying design requirements for the structural integrity and safety of wind turbines throughout their planned operational lifetime. Third edition (2005) and fourth edition (2019) are recognized.
Wind Class (I / II / III)	IEC-defined classifications based on reference wind speed and turbulence. Class I: Vref ≥ 50 m/s; Class II: Vref ≥ 42.5 m/s; Class III: Vref ≥ 37.5 m/s. Turbines must be certified for the wind class applicable to the project site.
Micro-Siting	The engineering process of optimizing the precise location of each wind turbine within the approved project boundary, taking into account wind resource distribution, wake losses, terrain effects, turbulence, setback requirements, and physical constraints.
Annual Energy Production (AEP)	The total electrical energy, measured in MWh or GWh, that a wind farm is projected to generate in one year under the long-term average wind resource conditions at the site.
Capacity Utilization Factor (CUF)	The ratio of actual energy produced by a wind plant over a given period to the maximum energy it could have produced if operating at rated capacity continuously during that period.
Availability Based Tariff (ABT)	A pricing and scheduling mechanism that links payments to a generator's compliance with a pre-declared generation schedule, thereby incentivizing grid discipline and stability.
Interconnection Feasibility Study (IFS)	A formal technical study, commissioned by the project developer and reviewed by the national grid operator, that determines the infrastructure, costs, and system impacts associated with connecting a wind project to the national electricity grid.
Interconnection Agreement (IA)	A legally binding contract between the project developer and the GoB/competent grid authority that sets out the terms, conditions, and technical responsibilities for grid connection of the wind power plant.
Kiosk	A standalone, public-facing terminal that allows users to perform specific tasks or access information.
No Objection Certificate (NOC)	A formal written approval issued by a competent authority confirming that the issuing agency has no objection to a specified activity, subject to any stated conditions.
Final Clearance Certificate (FCC)	A consolidated approval document issued by SREDA confirming that all requisite NOCs, studies, and certifications have been satisfactorily submitted and reviewed, and that the developer is authorized to commence turbine installation.
Computational Fluid Dynamics (CFD)	Advanced numerical modelling techniques used to simulate airflow patterns over complex terrain, enabling more accurate prediction of wind turbine energy output and optimization of turbine placement.
WAsP	Wind Atlas Analysis and Application Program—industry-standard linear flow modelling software developed by the Technical University of Denmark (DTU) for wind resource assessment and energy yield estimation.

Shadow Flicker	A visual phenomenon caused by the rotating blades of a wind turbine intermittently casting moving shadows on nearby buildings or open spaces as the sun passes behind the rotor disc.
Decommissioning	The planned process of safely shutting down, dismantling, removing, and disposing of or recycling wind turbine components at the end of the project's operational life, and restoring the site to an agreed condition.

1.4 Aims and Objectives

The overarching objective of this Guideline is to facilitate the orderly, efficient, and sustainable development of onshore wind power in Bangladesh. Specifically, the Guideline seeks to:

a. Establish technically robust minimum requirements aligned with international standards, including IEC 61400-1, IEC 61400-12, and IFC Performance Standards, ensuring that projects are designed and built to operate safely and efficiently for their full design life (typically 25 years or more).
b. Create a financially bankable framework by providing developers, lenders, and investors with a clear, predictable, and transparent regulatory pathway, thereby reducing perceived project risk and facilitating access to commercial and development finance.
c. Ensure environmental and social responsibility through comprehensive impact assessment requirements, biodiversity safeguards, community engagement mechanisms, and grievance redress processes consistent with international best practice.
d. Support national grid stability by requiring full compliance with the Bangladesh National Grid Code and BERC regulations, including advanced grid support functionalities.
e. Deliver community benefits through structured engagement, local employment, skills development, and infrastructure contributions, fostering social acceptance and sustainable development.
f. Simplify and streamline the regulatory approval process through a single-window NOC mechanism coordinated by SREDA, reducing the time, cost, and administrative burden for project developers.
g. Promote knowledge sharing and data transparency by requiring wind resource data to be shared with SREDA, thereby improving the national wind atlas and informing future policy and planning.

Chapter 2: Project Planning and Site Selection

2.1 Site Selection and Feasibility Study

The site selection process is the critical first phase of any wind power project and determines its long-term technical and commercial viability. After getting prior permission from the Power Division, any developer shall appoint a qualified and experienced consulting firm, with demonstrated expertise in wind energy project development, to conduct a comprehensive Feasibility Study. This study shall be submitted to SREDA for review and validation. SREDA shall issue a No Objection Certificate (NOC) upon satisfactory review of the proposed project layout proposed by the above-mentioned developers.

The Feasibility Study shall address, at a minimum, the following components:

a. Wind Resource Assessment: Multi-year wind data collection and analysis in accordance with IEC 61400-12-1, including vertical wind profiles, turbulence intensity, wind shear, and long-term correlation with reanalysis datasets (e.g., ERA5, MERRA-2).
b. Site Potential Assessment: Soil investigation, morphological and geotechnical surveys, topographic mapping, and assessment of land ownership and use.
c. Optimum Plant Capacity (OPC) Study: Determination of the technically and economically optimal installed capacity, including civil and structural design parameters.
d. Technology Selection: Assessment of appropriate wind turbine technology for the site's wind class, terrain complexity, and climatic conditions (cyclone risk, humidity, saline air).
e. Grid Integration Assessment: Preliminary evaluation of grid connection feasibility, point of interconnection options, and estimated grid reinforcement costs.
f. Construction Plan and Logistics: Assessment of access roads, heavy-lift transport routes, lay-down areas, and port facilities.
g. Environmental and Social Studies: IEE, EIA/ESIA, and Resettlement Action Plan (RAP) as appropriate, in accordance with GoB and IFC requirements.
h. Ancillary Studies: Noise impact, shadow flicker, microwave interference, and avian/bat survey as required.
i. Financial and Economic Analysis: Levelized Cost of Energy (LCOE), internal rate of return (IRR), sensitivity analysis, and bankability assessment.
j. Legal and Institutional Framework: Land rights analysis, regulatory compliance, and applicable procurement requirements.

2.2 Prefeasibility/ Feasibility study proposal for wind project

The government may get proposal from any Private Company/consortiums for developing wind projects/farm at any location in Bangladesh. Such Company/consortiums may perform survey and or pre-feasibility/feasibility/study/data collection with prior permission from competent authorities.

2.3 Ensuring proper use of Land

The Developer shall ensure that all land required for the project including turbine locations, access roads, substations, meteorological mast positions, lay-down areas, and cable routes can be lawfully used for the purpose of wind power development, and that all applicable land-use regulations, zoning requirements, and environmental restrictions are complied with.

SREDA shall issue a No Objection Certificate (NOC) upon satisfactory review of the proposed project layout. Land rights, leases, and easements shall be secured by the Developer for a period equal to or exceeding the term of the applicable Power Purchase Agreement (PPA), and shall specifically include the following rights:

a. Installation and maintenance of meteorological towers and wind monitoring equipment.
b. Conduct of environmental, geotechnical, archaeological, and cultural heritage surveys.
c. Establishment of construction lay-down and mobilization areas.
d. Construction of all wind energy infrastructure above and below ground level, including the Operations & Maintenance (O&M) facility and electrical substation.
e. Operation and maintenance of the wind power plant throughout its operational lifetime.
f. Right-of-way from the project site to the grid interconnection point.

Where allotment of land or site clearance is provided by the GoB for the purpose of wind power development, a maximum period of three (3) years from the date of allotment or permission shall be allowed for project development activities (including wind data collection, all related studies, and logistics arrangements) and commencement of commissioning. Extensions may be granted through a formal appeal to the GoB, subject to satisfactory demonstration of progress and extenuating circumstances.

For project developers who have already been allocated land or received a site clearance prior to the issuance of this Guideline, an additional transitional period of eighteen (18) months shall be provided, subject to a formal written undertaking to SREDA to comply with this Guideline and to commence commissioning within the stipulated period.

2.4 Wind Resource Assessment and Data Validation

Robust and bankable wind resource data is the foundation of any viable wind power project. The Developer shall be responsible for commissioning an Independent Wind Energy Assessment Report—commonly referred to as a 'bankable wind report'—prepared by an internationally recognized and accredited wind energy consultant.

The Independent Wind Energy Assessment Report shall satisfy the following minimum requirements:

a. Coverage of at least one full calendar year (8,760 hours) of measured wind data at the project site, with a long-term correction period of not less than ten (10) years.
b. Data collected using calibrated and certified anemometers, wind vanes, and data loggers installed in accordance with IEC 61400-12-1 and IEA Wind Recommended Practices.
c. Measurement heights to include at least the proposed hub height and at least two additional heights to enable characterization of the vertical wind profile.
d. Seasonal and directional wind resource analysis, including a wind rose and Weibull distribution parameters for each measurement height.
e. Long-term wind resource forecast and associated P50, P75, P90 energy yield estimates with uncertainty quantification.
f. Identification and quantification of all relevant loss factors (wake losses, electrical losses, availability losses, curtailment losses, etc.).

All wind data collected by the Developer shall be cross-validated against the SREDA national wind atlas database and any other available SREDA wind mast time-series data. SREDA shall make its wind mast data available to assist this validation process. The validated data and the Independent Wind Energy Assessment Report shall be shared with SREDA, which shall maintain the data in a secure national wind resource database to support continuous improvement of the national wind atlas.

2.5 Grid Connection Feasibility

The Developer shall confirm that grid connectivity is technically and commercially feasible at the proposed project site prior to committing to the project. This shall be demonstrated through a formal Interconnection Feasibility Study (IFS), conducted by a qualified grid engineering consultant and reviewed by the relevant grid operator.

The IFS shall identify and quantify all thermal, stability, power quality, and system impact issues associated with connecting the proposed project to the national grid. It shall include cost estimates for all grid reinforcement or connection facilities required. The Developer shall bear the full cost of the IFS.

a. The IFS shall include, as a minimum:

b. Project name, proposed installed capacity (MW), and geographic coordinates (latitude/longitude) of the proposed point(s) of interconnection.
c. Proposed primary and alternate points of interconnection, with a project boundary map.
d. Confirmation of Developer control over at least 10% of the total project land area at the time of IFS submission.
e. Selected turbine model and detailed electrical characteristics, including reactive power capability, fault ride-through performance, and power curve.
f. Proposed commercial operation date.
g. Signed letter from the turbine manufacturer confirming an executed turbine supply agreement and a production/delivery schedule consistent with the proposed commercial operation date.
h. Compliance declaration confirming that the selected wind turbine model meets BERC regulations on active/reactive power control, Low Voltage Ride Through (LVRT), High Voltage Ride Through (HVRT), power quality, and other applicable requirements.

Following satisfactory completion and review of the IFS, the GoB/SREDA shall provide a draft Interconnection Agreement (IA) to the Developer for execution within ninety (90) calendar days. The executed IA shall be a prerequisite for PPA signing.

2.6 Transport and Logistics Planning

The transportation of oversized and heavy wind turbine components (blades, towers, nacelles, and transformers) presents significant logistical challenges in Bangladesh, particularly given the density of the road network, bridge load limits, and seasonal flooding. The Developer shall prepare a detailed Transportation and Logistics Plan and submit it to SREDA as part of the NOC application.

The Logistics Plan shall include:

a. Identification of the entity responsible for component delivery and site logistics.
b. A detailed component delivery schedule linked to the project construction programme.
c. A component delivery route map from the port of entry to the project site, including bridge crossings and identified constraints.
d. Season-specific maximum permissible axle loads on all roads in the delivery route, verified by the competent road authority.

e. Maximum component dimensions and weights (loaded on truck and trailer) for each major component type.
f. All permits and fees required from the relevant road authorities, including details of the process for obtaining such permits.
g. A road repair performance bond, as may be required by the GoB Road authority, to be posted prior to commencement of delivery activities.

The Developer shall bear the full cost of any road repairs necessitated by component transportation activities.

References: IEC 61400-12-1 (2017) – Wind energy generation systems – Power performance measurements; IFC Environmental and Social Framework (2018); IEA Wind Recommended Practices RP2; BERC Grid Code (current edition); ERA5 and MERRA-2 reanalysis datasets (ECMWF / NASA).

Chapter 3: Environmental and Social Considerations

3.1 Environmental Acceptability

All wind power projects shall comply with the Bangladesh Environment Conservation Act, 1995, and the Environment Conservation Rules, 1997, as administered by the Department of Environment (DoE). The Developer shall obtain all required environmental clearances before commencing construction.

Where a project site is located within, adjacent to, or in the ecological connectivity zone of any of the following, additional mandatory clearances and mitigation plans are required:

a. Reserved forests, protected areas, or other officially designated conservation areas under the Forest Act, 1927 or the Bangladesh Wildlife (Preservation and Security) Act, 2012.
b. Recognized habitats or flight corridors of threatened, endangered, or migratory bird or bat species listed under the International Union for Conservation of Nature (IUCN) Red List or the Convention on Migratory Species (CMS).
c. UNESCO World Heritage Sites, archaeologically significant sites, and nationally recognized heritage establishments.
d. Coastal buffer zones, mangrove forests, and ecologically sensitive tidal flats.

All environmental clearance certificates shall be submitted to SREDA, which shall issue the Final Clearance Certificate (FCC) authorizing turbine installation at the specific site.

3.2 Noise Impact Assessment

The Developer shall commission a Noise Impact Assessment, conducted by a qualified acoustical consultant, and shall incorporate its findings into the final turbine layout. The assessment shall demonstrate compliance with the Noise Pollution (Control) Rules, 2006, of Bangladesh, as enforced by DoE. The permissible noise limits established by DoE are as follows:

Zone	Daytime Limit (dB)	Night-time Limit (dB)
Silent Zone (hospitals, schools, courts)	**50**	**40**
Residential Zone	**55**	**45**
Mixed Zone (residential + commercial)	**60**	**50**
Commercial Zone	**70**	**60**
Industrial Zone	**75**	**70**

Noise levels shall be evaluated relative to existing ambient background noise levels at all sensitive receptors within 2 km of the project boundary. Predictive computer modelling (e.g., WindPRO, SoundPLAN) shall be used to assess projected noise levels during turbine operation under all wind conditions. The final turbine layout shall be optimized to ensure compliance at all receptor locations.

3.3 Shadow Flicker Assessment

A Shadow Flicker Impact Assessment shall be conducted by a qualified consultant and paid for by the Developer prior to finalization of the turbine layout. The assessment shall identify all residential, educational, and medical buildings within the shadow flicker impact zone (typically 10 rotor diameters in the direction of the sun's arc) and quantify the expected shadow flicker hours per year and per day at each receptor.

Shadow flicker at any occupied building shall not exceed thirty (30) hours per year or thirty (30) minutes per day. Where predicted levels exceed these thresholds, the Developer shall mitigate impacts through one or more of the following measures:

- Repositioning of affected turbines within the approved project layout.
- Installation of automatic shadow flicker control systems that curtail turbine operation during periods of predicted flicker impact.
- Planting of vegetative screening or erection of approved shielding structures.

> *Reference: The 30-hour/year and 30-minute/day thresholds are consistent with the German guidelines on shadow flicker (Hinweise zur Planung und Genehmigung von Windkraftanlagen, 2011) and IEA Wind Recommended Practices RP6 (Shadow Flicker from Wind Turbines).*

3.4 Microwave and Telecommunication Interferences

The Developer shall commission a Microwave and Telecommunications Interference Study when the near-final turbine layout has been established. The study shall identify all existing and planned microwave communication links, radar installations, and telecommunications towers within a radius of 5 km of any proposed turbine location, and shall assess the potential for interference caused by turbine structures or rotating blades.

Any proposed turbine location found to be in the direct line-of-sight of two or more communication towers, or within the protected zone of a radar or navigation aid, shall be relocated to eliminate the interference risk before the layout is finalized. Clearance from the Bangladesh Telecommunication Regulatory Commission (BTRC) and, where applicable, the Bangladesh Betar (national broadcaster) shall be obtained and submitted to SREDA.

3.5 Environmental Risk Analysis (ERA)

An Environmental Risk Analysis (ERA) shall be conducted for each project by a DoE-accredited environmental consultant as an integral part of the environmental impact assessment process. The ERA shall employ a systematic, structured approach to identify, assess, prioritize, and propose management measures for all potential adverse environmental impacts throughout the project lifecycle—from site preparation and construction through operation to decommissioning.

The ERA shall include:

a. Baseline environmental surveys covering air quality, hydrology, soil quality, and ambient noise.
b. Predictive impact models for all significant impact pathways.
c. A climate vulnerability assessment addressing projected changes in wind resource, sea level, cyclone frequency/intensity, and temperature under representative climate scenarios (consistent with IPCC AR6).
d. A risk matrix categorizing identified impacts by likelihood and severity (Low / Medium / High / Critical).
e. A comprehensive Environmental Management Plan (EMP) with specific mitigation, monitoring, and reporting measures for each identified significant risk.

The ERA shall be submitted jointly to SREDA and DoE within sixty (60) calendar days of completion of site investigations. Both SREDA and DoE shall review the ERA and provide consolidated comments within thirty (30) calendar days of receipt.

3.6 Biodiversity and Ecological Risk Mitigation

Bangladesh is globally recognized as a biodiversity-rich country, hosting unique ecosystems including the Sundarbans mangrove forest (a UNESCO World Heritage Site and Ramsar Wetland), coastal char lands, hill forest ecosystems, and the floodplain habitats of the Ganges-Brahmaputra-Meghna delta. Wind power development shall be managed responsibly to avoid, minimize, and offset ecological impacts in accordance with the mitigation hierarchy.

Biodiversity risk assessment and mitigation shall comply with IFC Performance Standard 6 (Biodiversity Conservation and Sustainable Management of Living Natural Resources, 2012) and the Convention on Biological Diversity (CBD). The following measures are mandatory:

a. Seasonal avian and bat surveys covering a minimum of one full annual cycle (twelve months), conducted by qualified ornithologists and ecologists using internationally accepted methodologies (e.g., Birdlife International standards).
b. Habitat mapping for critically endangered, endangered, and vulnerable species as listed on the IUCN Red List.

c. Ecological corridor assessment to identify and protect connectivity between key habitats.
d. Application of the mitigation hierarchy: avoidance, minimization, restoration, and biodiversity offset, in that order of preference.
e. Turbine curtailment protocols during identified peak migration periods and seasons, based on monitoring data.
f. Native vegetation replanting programmes for all areas of vegetation cleared during construction.
g. Contribution to a national biodiversity fund or an approved biodiversity offset programme if residual impacts cannot be avoided or minimized.
h. Post-construction wildlife mortality monitoring for a minimum of three (3) years of operation, with annual reporting to SREDA and DoE.

3.7 Civil Aviation Clearance

The Developer shall submit the final proposed turbine layout to the Civil Aviation Authority of Bangladesh (CAAB) for review and approval. The submission shall assess the proximity of all turbine locations to public and private airports, aerodromes, heliports, and established air corridors, and shall propose an aviation warning lighting design in accordance with CAAB and ICAO (International Civil Aviation Organization) standards.

CAAB clearance is a mandatory prerequisite for the issuance of SREDA's Final Clearance Certificate (FCC).

3.8 No Objection Certificates from local Authorities

The Developer shall obtain No Objection Certificates (NOCs) from all relevant local and national authorities. Required NOCs include, but are not limited to:

a. Union Parishad (community-level consent and awareness).
b. District Administration (land, law and order, security).
c. Bangladesh Forest Department (where applicable).
d. Department of Agriculture Extension (where agricultural land is affected).
e. Department of Archaeology (where sites of cultural or historical significance are in proximity).
f. Bangladesh Water Development Board (where flood embankments or water management structures are affected).

Public hearings at the Gram Sabha (village assembly) level are mandatory for all projects. Project details, including the environmental and social impact assessment, shall be disclosed to the public

in Bengali at least thirty (30) days prior to the public hearing. SREDA shall facilitate a digital single-window NOC processing system with a default approval timeline of twenty-one (21) calendar days for each issuing authority.

The Developer shall execute a Community Benefits Agreement (CBA) with the host communities, covering as a minimum: local employment and skills development commitments, contributions to local infrastructure, and arrangements for community energy access or revenue sharing. The CBA shall be submitted to SREDA as part of the NOC application.

References: Bangladesh Environment Conservation Act, 1995; Environment Conservation Rules, 1997; Noise Pollution (Control) Rules, 2006; Bangladesh Wildlife (Preservation and Security) Act, 2012; Forest Act, 1927; IFC Performance Standard 6 (2012); IPCC Sixth Assessment Report (2021–2022); IEA Wind RP6; ICAO Annex 14; CAAB AIC/Circulars on wind turbines.

Chapter 4: Bidding Process

4.1 Zone/Block wise Bidding without prior study

The Government of Bangladesh can divide the possible wind energy harvesting areas into different blocks and sub-blocks. Having available wind data and/or all other related information, the government can invite tender for each block or sub-block. This procedure will ensure transparency in procurement of power from wind projects/farms. The PPR 2025 along with all possible clauses necessary for procuring renewable energy/power from private parties will be applicable in the procurement process.

4.2 Zone/Block wise Bidding with prior study/data

The government may get proposal from any Private Company/consortiums for developing wind projects/farm at any location in Bangladesh. Such Company/consortiums may perform survey and or pre-feasibility/feasibility/study/data collection with prior permission from competent authorities and show their interest to build wind projects in the same location. The government still can conduct a competitive bidding process before award. As the government never commits for offering any project while giving them permission for survey/pre-feasibility/feasibility/study/data collection. The government must ensure public interest as well as alignment of the project with development plans/goals and active Renewable Energy Policy.

4.3 Public Private Partnership (PPP) Modality

A Tendering Process for a Wind Energy Project under Public-Private Partnership (PPP) modality is also possible. Usually, this process follows a structured procurement cycle used by governments and public utilities to select a private developer for financing, designing, constructing, operating, and maintaining the wind energy project. The exact process varies by country, but internationally accepted PPP practices are broadly similar. The Public -Private Partnership Authority (PPPA) of Bangladesh can take necessary steps and initiate Technical Advisory Service (TAS) for developing tendering process and Tender document with bid parameter(s) of tender/proposal for wind projects in PPP Modality. This method is applicable for both of the criteria mentioned in 4.1 and 4.2.

Chapter 5: Technical Design and Certification

5.1 Type Certification and Quality Assurance

Type certification provides independent third-party assurance that a wind turbine model has been designed, documented, tested, and manufactured in conformity with recognized international engineering standards and is fit for safe and reliable operation over a design lifetime of not less than twenty-five (25) years. Type certification is a mandatory requirement for all wind turbines installed under this Guideline.

The Developer's Certification Application shall include the following documentation:

a. A valid Type Certificate for the selected turbine model, issued by an internationally accredited certification body recognized under the IEC System for Certification to Standards Relating to Equipment for Use in Renewable Energy Applications (IECRE) or the Germanischer Lloyd (GL) / DNV GL type certification scheme.
b. A certified power curve for the selected turbine model, measured in accordance with IEC 61400-12-1.
c. A signed manufacturer's letter confirming that the selected turbine model is optimally designed for the specific wind resource regime (IEC Wind Class) at the project site, taking into account the site's wind speed distribution, turbulence intensity, wind shear, and extreme wind conditions.
d. A copy of the manufacturer's Mechanical Loads Analysis for the near-final turbine layout, demonstrating that the site-specific turbulence intensity is within the limits specified in the manufacturer's design envelope for the selected model.
e. Engineering drawings showing the principal dimensions of the foundation, tower, nacelle, hub, and blades for the specific model selected, including hub height.
f. A foundation design for all project turbines, accompanied by a geotechnical site investigation report and a foundation engineering design stamped by a licensed Professional Engineer (PE), demonstrating that the foundation is appropriate for the site's soil conditions and seismic zone.

SREDA shall maintain and regularly update a publicly available list of recommended turbine models certified for IEC Wind Class II and Class III regimes, with a track record of high performance and high availability in tropical and subtropical climates. This list shall be accessible through the SREDA online portal and shall be used as a reference by project developers, lenders, and government procurement entities.

5.2 Micro-Siting Requirements

Micro-siting is the systematic process of optimizing the precise location of each Wind Turbine Generator (WTG) within the approved project site boundary to maximize Annual Energy Production (AEP) while complying with all applicable constraints. The Developer shall use industry best-practice wind flow modelling and optimization tools to micro-site each turbine.

The following requirements shall apply:

- Wind flow modelling shall be conducted using WAsP or equivalent linear flow modelling software for simple to moderately complex terrain, and Computational Fluid Dynamics (CFD) modelling tools for complex terrain, terrain with significant thermal effects, or sites where WAsP model uncertainty is high.
- Site assessment shall comply with IEC 61400-1 Ed.4 standards with respect to extreme wind, flow inclination, vertical wind shear, turbulence intensity, and wake-added turbulence.
- Wake losses: The Developer shall use appropriate wake models (e.g., PARK, Fuga, or CFD-based wake models) to quantify and minimize wake losses. Wake losses shall not exceed ten percent (10%) of gross AEP.
- The Developer shall secure adequate buffer land around the project boundary to protect the wind resource from interference by future competing wind projects.
- CFD modelling shall be used to estimate AEP in all cases where terrain complexity index (as defined in IEC 61400-1) exceeds moderate complexity, or where significant thermal instability is identified.

Mandatory turbine setback distances are as follows:

Sensitive Receptor / Infrastructure	Minimum Setback Distance
Occupied dwellings / residences (full-time occupied)	**500 metres**
Public roads, highways, and railway tracks	**1.1 × Total Turbine Height (tip height above ground)**
High-voltage overhead transmission lines	**1.1 × Total Turbine Height**
Public or community buildings (schools, hospitals, mosques, etc.)	**1.1 × Total Turbine Height**
Property boundaries (non-participating landowners)	**1.1 × Total Turbine Height**
Other wind turbines within the project (inter-turbine spacing)	**Minimum 3 × rotor diameter (cross-wind); minimum 5 × rotor diameter (downwind)**

> *Note: The 500 m residential setback is a minimum requirement based on noise modelling considerations. Actual setbacks shall be determined by the Noise Impact Assessment and may exceed this minimum where required to achieve compliance with DoE noise standards.*

5.3 Grid Code Compliance

All wind power projects shall achieve full compliance with the Bangladesh National Grid Code (as published by the Bangladesh Power Grid Company Limited, PGCB) and all applicable BERC Regulations. Grid Code compliance is a non-negotiable precondition for project approval, PPA signing, and grid connection.

Mandatory grid compliance requirements include:

a. Fault Ride-Through (FRT) capability: Turbines shall remain connected to the grid and contribute to grid voltage support during voltage disturbances in accordance with BERC Low Voltage Ride Through (LVRT) and High Voltage Ride Through (HVRT) requirements.
b. Active and reactive power control: The project shall be capable of active power curtailment on instruction from the grid operator and reactive power control within the specified range to support voltage regulation.
c. Power quality: The project shall comply with BERC power quality standards with respect to harmonics, voltage flicker (IEC 61000-3-7), and frequency deviations.
d. Frequency response: Where specified by the grid operator, the project shall be capable of providing primary frequency response (governor response) and synthetic inertia.
e. Forecasting and scheduling: The project shall be equipped to provide short-term (day-ahead and intra-day) generation forecasts to the grid operator in compliance with ABT regulations.

5.4 Energy Storage Systems

The variable and intermittent nature of wind energy, combined with the relatively low Capacity Utilization Factor (CUF) of onshore wind projects in Bangladesh (typically 25–35%), means that energy storage systems can significantly enhance the grid value of wind power and support overall grid stability.

Developers are encouraged, and in some circumstances may be required by SREDA or the grid operator, to integrate co-located energy storage systems with their wind projects. Any such systems shall comply with applicable GoB energy storage policy and shall satisfy all relevant requirements of the National Grid Code, including response time, state-of-charge management, and safety standards. The Developer shall submit an Energy Storage Installation Plan to SREDA as part of the NOC application where storage is proposed.

References: IEC 61400-1 Ed.4 (2019); IEC 61400-12-1 (2017); IEC 61000-3-7 (Power Quality); BERC Grid Code (current edition); IECRE Operational Document OD-501; DNV GL/DNV Type Certification Scheme; Bangladesh National Grid Code (PGCB, current edition).

Chapter 6: Project Implementation

6.1 Metering and Real Time Grid Monitoring

The Developer shall install an Availability Based Tariff (ABT)-compliant revenue-grade energy meter with telecommunications capability at the project's pooling station or grid interconnection substation. This is mandatory for implementation of the generation forecasting, scheduling, and dispatch regime applicable to wind generators under BERC regulations.

All vital grid parameters—including active power output, reactive power, frequency, voltage, and fault events—shall be communicated in real time to the relevant Regional Load Dispatch Centre (RLDC) or National Load Dispatch Centre (NLDC). The telecommunications infrastructure, data protocols, and monitoring interface shall comply with the specifications prescribed by PGCB and BERC. Detailed metering and SCADA requirements shall be specified in the Power Purchase Agreement and the Interconnection Agreement.

6.2 Online Registry and Annual Performance Reporting

SREDA shall establish and maintain a national online registry of all wind turbines installed in Bangladesh. Each registered turbine shall be assigned a unique national registration number, and its key technical and operational parameters shall be recorded in the registry.

The Developer shall be responsible for registering all turbines in the national registry within thirty (30) days of commissioning. The Developer shall submit an annual performance report to SREDA within sixty (60) days of the end of each calendar year. The annual report shall cover:

a. Energy performance: actual AEP vs. predicted AEP; CUF; availability factor; curtailment losses.
b. Operations and maintenance: maintenance activities undertaken; unplanned outages; component replacements.
c. Training and workforce development: training activities completed; local employment statistics.
d. Community engagement: summary of community engagement activities and outcomes.
e. Environmental monitoring: results of post-construction wildlife mortality monitoring, noise monitoring, and any other required environmental monitoring.

SREDA shall be responsible for aggregating and publishing anonymized national wind energy performance statistics to inform policy planning and support continuous improvement of the sector.

Chapter 7: Project Lifecycle Management

7. 1 Decommissioning Planning

Responsible end-of-life management of wind turbines is a critical component of sustainable project development. Every project proposal shall include a Decommissioning Plan as a mandatory element of the application for SREDA's NOC.

The Decommissioning Plan shall address:

a. A schedule and methodology for the safe dismantling and removal of all project infrastructure (turbines, towers, foundations, cables, substations, and access roads) at the end of the operational life or upon cessation of operations.
b. Site restoration to a condition agreed with the relevant landowners and local authorities, including soil remediation, re-vegetation, and removal of hard-standings.
c. Waste management and material recycling: The Plan shall specify recycling pathways for all major component materials, including steel towers, concrete foundations, copper cables, and composite blade materials. Developers are encouraged to commit to certified blade recycling in accordance with emerging international standards (e.g., WindEurope Responsible Blade Recycling Pledge).
d. Financial security: The Developer shall post a Decommissioning Security Bond—in the form of a bank guarantee or escrow account—with SREDA or the GoB at the time of financial close. The bond amount shall be calculated by a qualified quantity surveyor as the estimated full cost of decommissioning and site restoration, updated every five years.

SREDA shall, in consultation with relevant stakeholders, formulate detailed Decommissioning Guidelines for the wind energy sector. Until such guidelines are issued, the Decommissioning Plan shall be prepared in accordance with international best practice, including Wind Europe's 'Decommissioning of Wind Turbines' guidelines (2020) and the IFC Environmental and Social Framework.

7.2 Community Engagement and Benefit Sharing

The long-term success of wind power projects—particularly in rural and coastal areas of Bangladesh—depends critically upon the informed consent, active participation, and genuine benefit of host communities. The Developer shall develop and implement a Community Engagement and Benefit Sharing Plan (CEBSP), submitted to SREDA as part of the NOC application, covering the full project lifecycle.

The CEBSP shall include, as a minimum:

a. Pre-construction community consultation: public meetings at the Gram Sabha level to explain the project, answer questions, and receive community feedback, conducted in Bengali and facilitated by a qualified community liaison officer.

b. Ongoing consultation during construction and operation: regular community liaison meetings, with minutes recorded and made available to SREDA.
c. Local employment and procurement commitments: minimum targets for employment of local labour during construction and operation phases.
d. Community fund: an annual contribution by the Developer to a community development fund, to be administered by a committee with meaningful community representation, for purposes agreed with the community (e.g., education, health, infrastructure, livelihood development).
e. Education and awareness: engagement with local schools, colleges, and universities to build awareness of and interest in renewable energy, including establishment of a community information point (Kiosk) near the project site or local library.
f. Community energy access: where feasible, arrangements for supplying affordable electricity to host communities.

7.3 Grievance Redress Mechanism (GRM)

The Developer shall establish and maintain an accessible, transparent, and effective project-level Grievance Redress Mechanism (GRM) throughout the project lifecycle—from site preparation through decommissioning. The GRM shall enable any person, household, community group, or organization affected by or concerned about the project to raise a grievance and receive a timely, documented response.

The GRM shall be designed in accordance with IFC Performance Standard 1 (Assessment and Management of Environmental and Social Risks and Impacts) and shall include:

a. Multiple accessible grievance registration channels (in-person, telephone, written, and digital), available in Bengali.
b. Acknowledgement of all grievances within five (5) working days.
c. Investigation and substantive response within thirty (30) calendar days.
d. An escalation pathway to SREDA's national Grievance Redress System (GRS) for unresolved grievances at project level.
e. Quarterly grievance reporting to SREDA as part of the annual performance report.

SREDA's national GRS shall serve as the final point of escalation for unresolved project-level grievances. SREDA shall resolve referred grievances through discussion and, where necessary, mediation with the Power Division.

Chapter 8: Regulatory Process and Approvals

Schedule 1: Site Selection and Feasibility- Detailed Requirements

S1.1 Wind Data Requirements

a. The Independent Wind Energy Assessment Report shall be based on a minimum of 8,760 hours (one full calendar year) of continuously measured site-specific wind data.
b. The report shall include seasonal wind resource descriptions, wind roses for each measurement height, Weibull distribution parameters, turbulence intensity profiles, and a long-term forecast section based on correlation with at least one long-term reference dataset of not less than ten years.
c. All raw data, processed data, and the final report shall be submitted to SREDA in both digital and hard-copy format.

S1.2 Interconnection Feasibility Study – Minimum Content

a. Project name, proposed installed capacity (MW), and geographic coordinates (latitude/longitude) of the primary and alternate proposed points of interconnection.
b. A project boundary map indicating the primary and alternate interconnection points.
c. Evidence that the Developer has legal control over at least 10% of the total project land area at the time of IFS submission.
d. Selected turbine model and all relevant electrical characteristics required to complete the electrical system impact study.
e. Proposed Commercial Operation Date (COD).
f. Signed letter from the turbine manufacturer confirming an executed Turbine Supply Agreement (TSA) and a production/delivery schedule consistent with the proposed COD.
g. A compliance certification statement confirming that the selected wind turbine model satisfies Bangladesh Grid Code requirements for active/reactive power control, LVRT, HVRT, power quality, and all other applicable BERC standards and regulations.

S1.3 Transportation and Logistics Plan – Minimum Content

a. Identity of the entity responsible for component delivery and site logistics.
b. Detailed component delivery schedule linked to the construction programme.
c. Delivery route map from port of entry to project site.

d. Season-specific maximum permissible axle loads on all delivery route roads, certified by the competent road authority.
e. Maximum dimensions and weights of each major component type (loaded on truck and trailer).
f. All applicable transport permits and fees, and process for obtaining them from the road authority.

S1.4 Environmental, Cultural and Social Studies – Minimum Content

a. An estimated annual greenhouse gas (GHG) emissions reduction forecast (template available on the SREDA website).
b. A comprehensive avian and bat survey report covering a minimum of twelve months.
c. Where the project is in proximity to cultural, historical, or archaeological sites: a Mitigation Plan to minimize or eliminate disturbances, including proposed setbacks from identified sites.
d. All studies shall be reviewed and approved by SREDA and, where applicable, by the relevant GoB authority (DoE, Department of Archaeology, etc.).

Schedule 2: Type Certification and Quality Assurance- Detailed Requirements

The Developer's Type Certification Application shall include all of the following:

a. A valid Type Certificate for the exact turbine model and hub height selected, issued by an internationally accredited certification body under the IECRE scheme or equivalent DNV/GL type certification framework, together with the certified power curve.
b. A signed letter from the turbine manufacturer confirming that the selected model is optimally designed for the IEC Wind Class applicable to the project site.
c. A copy of the manufacturer's Mechanical Loads Analysis for the near-final turbine layout, demonstrating that site-specific turbulence intensity is within the model's design envelope.
d. Engineering drawings showing the principal dimensions of the foundation, tower, nacelle, hub, and blades for the selected model.
e. A geotechnical site investigation report and a foundation engineering design stamped by a licensed Professional Engineer (PE), demonstrating the appropriateness of the proposed foundation type for the site's soil conditions.

Schedule 3: Micro-sitting- Detailed Technical Criteria

The following technical criteria shall govern micro-siting for all onshore wind power projects in Bangladesh:

a. Wind turbine locations shall be optimized within the approved project site boundary using appropriate wind flow modelling and optimization tools (linear and non-linear), subject to a full site assessment in accordance with IEC 61400-1 Ed.4, considering extreme wind, flow inclination, vertical wind shear, turbulence intensity, and wake-added turbulence with terrain complexity corrections.
b. The Developer shall secure adequate buffer land around the project perimeter to protect the wind resource from interference by future competing wind projects.
c. Wake losses shall be minimized through turbine spacing optimization; a wake loss of not more than ten percent (10%) (net AEP compared to gross AEP) shall be targeted and shall be explicitly calculated and reported.
d. CFD modelling shall be required for AEP estimation in cases involving complex terrain, significant thermal instability, or high terrain complexity index as defined in IEC 61400-1 Ed.4.
e. Minimum turbine setback distances shall be as specified in the Setback Table in Chapter 4.2 of this Guideline.

Schedule 4: NOC Application Checklist

The following documents shall be submitted to SREDA as part of the NOC application. Incomplete applications will not be processed. All documents shall be submitted in both English and Bengali (or with a certified Bengali translation where the original is in English).

SL	Required Document	Relevant Chapter
1	Signed land lease contract(s)/land rights agreement(s) with project layout map	**Ch. 2.2**
2	Independent Wind Energy Assessment Report (bankable wind report)	**Ch. 2.3**
3	Interconnection Feasibility Study (IFS) Report	**Ch. 2.4**
4	Transportation and Logistics Plan with permits from relevant road authorities	**Ch. 2.5**
5	Environmental clearance certificate from the Department of Environment (DoE)	**Ch. 3.1**
6	Noise Impact Assessment Report	**Ch. 3.2**
7	Shadow Flicker Impact Assessment Report	**Ch. 3.3**
8	Microwave and Telecommunications Interference Study Report (if applicable)	**Ch. 3.4**
9	Environmental Risk Analysis (ERA) Report	**Ch. 3.5**
10	Avian and bat survey report with biodiversity mitigation plan	**Ch. 3.6**
11	Civil Aviation Authority of Bangladesh (CAAB) clearance certificate	**Ch. 3.7**
12	NOCs from all required local and national authorities (see Ch. 3.8)	**Ch. 3.8**
13	Community Benefits Agreement (CBA)	**Ch. 3.8 / 6.2**
14	Type Certification documents as specified in Schedule 2	**Ch. 4.1 / Sch.2**
15	Grid connectivity plan and BERC Grid Code compliance declaration	**Ch. 4.3**
16	Energy Storage Installation Plan (if energy storage is proposed)	**Ch. 4.4**
17	Decommissioning Plan including security bond details	**Ch. 6.1**
18	Community Engagement and Benefit Sharing Plan (CEBSP)	**Ch. 6.2**
19	Grievance Redress Mechanism (GRM) design document	**Ch. 6.3**
20	NOC Processing Fee in the form of a Pay Order payable to SREDA	**Ch. 7.1**
21	Transportation permit(s) from relevant road authority/authorities	**Ch. 2.5**
22	NOC from District Administration	**Ch. 3.8**

Reference and Standards

The following international standards, national legislation, and reference documents have informed this Guideline and are applicable to wind power project development in Bangladesh:

International Standards and Frameworks

1. IEC 61400-1 Ed.4 (2019): Wind Energy Generation Systems – Design Requirements.
2. IEC 61400-12-1 Ed.2 (2017): Wind Energy Generation Systems – Power Performance Measurements.
3. IEC 61400-22 (2010) / IECRE OD-501: Type and Component Certification for Wind Turbines.
4. IEC 61000-3-7 (2008): Power Quality – Emission Limits for Fluctuating Loads.
5. IEA Wind Recommended Practice 2 (RP2): Measurement and Assessment of Wind Resources.
6. IEA Wind Recommended Practice 6 (RP6): Shadow Flicker from Wind Turbines.
7. IFC Performance Standards 1–8 (2012): International Finance Corporation Environmental and Social Performance Standards.
8. IFC Environmental and Social Framework (World Bank, 2018).
9. GWEC Global Wind Report (2024): Global Wind Energy Council Annual Reference.
10. WindEurope: Decommissioning of Wind Turbines – Best Practice Guidelines (2020).
11. IPCC Sixth Assessment Report (AR6, 2021–2022): Climate Change Scenarios and Projections.
12. Convention on Biological Diversity (CBD, 1992).
13. Convention on Migratory Species (CMS/Bonn Convention, 1979).
14. ICAO Annex 14 – Aerodromes (Volumes I and II, current edition).

National Legislation and Policy Documents

1. SREDA Act, 2012 (Act No. 4 of 2012), Government of Bangladesh.
2. Bangladesh Energy Regulatory Commission (BERC) Act, 2003.
3. Bangladesh Environment Conservation Act, 1995 (as amended 2010).
4. Environment Conservation Rules, 2023.
5. Noise Pollution (Control) Rules, 2025.
6. Bangladesh Wildlife (Conservation and Security) Ordinance, 2025.
7. Forest and Tree Conservation Ordinance, 2025.
8. Bangladesh Water Development Board Act, 2000.
9. Bangladesh National Grid Code (PGCB, current edition).
10. BERC Regulations on Grid Connection, Power Quality, and Tariff (current editions).
11. Renewable Energy Policy, 2025.
12. Procurement Guidelines for Renewable Energy Projects, Power Division, Government of Bangladesh (current edition).