WIND ENERGY SECTOR: ECONOMIC GEOGRAPHY

India's Renewable Revolution: Building Clean Power, Made in India

On July 31, 2025, the Ministry of New and Renewable Energy (MNRE) announced a comprehensive set of new regulations designed to overhaul India's wind energy sector. The central reform mandates that all wind turbine manufacturers operating in India must establish domestic supply chains, local Research & Development (R&D) centres, and in-country data centres.

Status of Wind Energy in India (As of July 2025)

Global Standing

India holds a significant position in the global renewable energy landscape. It ranks fourth globally in terms of total installed wind power capacity. It is the third-largest producer of renewable energy in the world.

Strong Growth Trajectory

The sector has witnessed remarkable growth over the last decade. Installed capacity has surged from 21.04 GW in 2014 to 52.1 GW as of July 2025.

Role in India's Renewable Mix

Wind energy is the second-largest contributor to India's renewable energy portfolio, surpassed only by solar energy. The total renewable energy capacity in India currently stands at 237.49 GW.

Geographical Potential

Several states possess high potential for wind energy generation, including Rajasthan, Gujarat, Maharashtra, Karnataka, Tamil Nadu, and Andhra Pradesh. According to estimates from the National Institute of Wind Energy (NIWE), India has a massive untapped wind power potential of 1,163.86 GW at a hub height of 150 metres above ground level.

Key Provisions of the New Policy

Approved List of Models and Manufacturers (ALMM – Wind)

Replacement of RLMM

This new, stricter list replaces the previous Revised List of Models and Manufacturers (RLMM).

Mandatory Domestic Sourcing

It mandates that critical turbine components must be sourced exclusively from domestic suppliers approved under the ALMM.

Specified Components

The key components covered under this mandate include blades, towers, gearboxes, generators, and bearings.

Economic Impact

These specified components constitute a significant portion—approximately 65–70%—of a wind turbine's total cost.

Domestic Research & Development (R&D) Requirements

Mandatory R&D Centres

All manufacturers are required to establish their own R&D centres within India within a one-year timeframe.

Customisation for Indian Conditions

The primary goal of this mandate is to ensure that wind turbines are specifically designed and customised to perform efficiently under unique Indian environmental conditions, such as:

1. Low average wind speeds.
2. High ambient temperatures and humidity.
3. Frequent dust storms and challenging terrain.

Cybersecurity and Data Sovereignty Safeguards

Local Data Storage

All operational data generated by wind turbines must be stored on servers located within India.

Ban on Real-Time Data Transfer

The policy explicitly prohibits the transfer of real-time operational data to facilities or servers located abroad.

In-Country Operations & Control

All operational and control activities for wind farm management must be conducted exclusively from facilities situated within India.

Quality Assurance through BIS Certification

Mandatory Certification

From September 2026, Bureau of Indian Standards (BIS) certification will become mandatory for all wind turbine components.

Ensuring Standards

This measure aims to enforce high standards of safety, reliability, and performance under the Machinery & Electrical Equipment Safety norms.

Transition Provisions and Exemptions

To ensure a smooth transition, the policy includes several exemptions:

Existing Projects

Projects that were already bid out before July 2025 are exempt, provided they are commissioned within 3 years.

Captive/Industrial Projects

Captive and industrial projects are also exempt if they are commissioned within 18 months.

Innovation Window

An exemption for up to 800 MW of installed capacity is provided for the deployment of new turbine models over a 2-year period to encourage technological innovation.

Rationale Behind the Reforms

Achieving Strategic Autonomy

A primary driver is to reduce the sector's growing dependence on Chinese imports. China's market share for wind components in India surged from just 10% in 2019 to 45% in 2025.

Creating a Level Playing Field

The reforms aim to protect and promote domestic manufacturers. Local players like Suzlon (with a 31% market share) were at a significant disadvantage due to competition from cheaper Chinese imports.

Enhancing National Security

The policy addresses critical risks flagged by the National Security Advisor (NSA) and NITI Aayog concerning foreign-controlled data servers and remote software updates. It aims to bolster the cyber resilience of India's critical energy infrastructure.

Boosting Economic Efficiency

The reforms are intended to tackle the significant underutilisation of India's domestic wind turbine manufacturing capacity. While the domestic industry has a capacity to produce 20 GW annually, only 4.15 GW was actually installed in the fiscal year 2024–25.

Key Government Initiatives Supporting the Wind Sector

The new regulations are built upon a foundation of existing government policies and incentives:

National Offshore Wind Energy Policy (2015)

This policy provides a framework to leverage India's extensive coastline for developing offshore wind projects, with NIWE acting as the nodal agency.

National Wind-Solar Hybrid Policy (2018)

Promotes the development of large-scale hybrid projects that combine wind and solar power to improve grid stability and provide a more consistent energy supply.

Financial Incentives

The government encourages private investment through various fiscal benefits, including accelerated depreciation, concessional customs duty on certain components, and the Generation-Based Incentive (GBI) for older projects.

Repowering Policy for Wind Power Projects

This policy focuses on replacing old, inefficient wind turbines (typically under 2 MW) with modern, higher-capacity units to maximize energy generation from existing high-potential sites.

Wind Capacity Expansion Measures

Includes a long-term Wind Renewable Purchase Obligation (RPO) trajectory until 2030 and a waiver of Inter-State Transmission System (ISTS) charges for solar and wind projects commissioned by June 30, 2025.

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