

# **Global Direct Drive (Gearless) Wind Turbine Market Size Study & Forecast, by Capacity (Less than 1 MW, 1 MW–3 MW, Higher than 3 MW), by Technology (Permanent Magnet Synchronous Generator (PMSG), Electrically Excited Synchronous Generator (EESG)), and Regional Forecasts 2025–2035**

<https://marketpublishers.com/r/G9F27A5AB94FEN.html>

Date: November 2024

Pages: 285

Price: US\$ 3,750.00 (Single User License)

ID: G9F27A5AB94FEN

## **Abstracts**

The Global Direct Drive (Gearless) Wind Turbine Market is valued at approximately USD 17.75 billion in 2024 and is poised to register a stellar CAGR of 16.30% over the forecast period from 2025 to 2035. Gearless wind turbines, also known as direct drive systems, are transforming the renewable energy landscape by eliminating the gearbox and thereby reducing mechanical complexity, noise, and maintenance costs. This technology relies on low-speed, high-torque generators directly connected to the rotor shaft, which significantly improves reliability and efficiency—making it ideal for offshore and onshore installations alike. As the global appetite for sustainable and low-emission energy alternatives continues to swell, the demand for these turbines is expected to surge dramatically across both developed and emerging economies.

The wind energy sector is undergoing a seismic shift driven by urgent decarbonization targets, rising fossil fuel prices, and massive investments in infrastructure modernization. Direct drive turbines have rapidly gained favor due to their robust performance in extreme conditions, lower operational expenses, and longer lifecycle. Permanent Magnet Synchronous Generator (PMSG) technology, in particular, is garnering immense interest due to its superior efficiency and reduced energy losses. According to IRENA, global installed wind energy capacity surpassed 940 GW by the end of 2023, and direct drive solutions are playing a pivotal role in offshore expansions, where reliability is non-negotiable and maintenance logistics are cost-intensive.

Technological breakthroughs in superconducting materials and lighter nacelle designs are expected to further propel innovation and adoption in the coming decade.

Regionally, Europe continues to dominate the global direct drive wind turbine market, driven by aggressive climate policies, vast offshore potential in the North Sea, and consistent government incentives. Countries such as Germany, the UK, and Denmark are at the forefront of adopting gearless turbine technologies to meet their net-zero ambitions. North America, led by the U.S. and Canada, is seeing substantial growth through repowering of aging turbines and large-scale offshore wind projects along the Atlantic coast. Meanwhile, the Asia Pacific region is poised for the fastest growth, with China and India massively expanding their wind energy portfolios. China's leadership in wind equipment manufacturing and supportive policy reforms are crucial accelerators. Latin America and the Middle East & Africa are gradually stepping into the space, supported by favorable wind conditions and diversification strategies away from oil-dependent economies.

Major market players included in this report are:

Siemens Gamesa Renewable Energy

Goldwind Science & Technology Co., Ltd.

GE Renewable Energy

Vestas Wind Systems A/S

ENERCON GmbH

Suzlon Energy Limited

Hitachi Ltd.

ABB Ltd.

Doosan Heavy Industries & Construction

WEG Industries

Senvion S.A.

Nordex SE

American Superconductor Corporation

MHI Vestas Offshore Wind A/S

Leitwind AG

### Global Direct Drive (Gearless) Wind Turbine Market Report Scope:

Historical Data – 2023, 2024

Base Year for Estimation – 2024

Forecast period – 2025–2035

Report Coverage – Revenue forecast, Company Ranking, Competitive Landscape, Growth factors, and Trends

Regional Scope – North America; Europe; Asia Pacific; Latin America; Middle East & Africa

Customization Scope – Free report customization (equivalent up to 8 analysts' working hours) with purchase. Addition or alteration to country, regional & segment scope\*

The objective of the study is to define market sizes of different segments & countries in recent years and to forecast the values for the coming years. The report is designed to incorporate both qualitative and quantitative aspects of the industry within the countries involved in the study. The report also provides detailed information about crucial aspects, such as driving factors and challenges, which will define the future growth of the market. Additionally, it incorporates potential opportunities in micro-markets for stakeholders to invest, along with a detailed analysis of the competitive landscape and product offerings of key players.

The detailed segments and sub-segments of the market are explained below:

*Global Direct Drive (Gearless) Wind Turbine Market Size Study & Forecast, by Capacity (Less than 1 MW, 1 MW–3...*

**By Capacity:**

Less than 1 MW

1 MW–3 MW

Higher than 3 MW

**By Technology:**

Permanent Magnet Synchronous Generator (PMSG)

Electrically Excited Synchronous Generator (EESG)

**By Region:****North America**

U.S.

Canada

**Europe**

UK

Germany

France

Spain

Italy

Rest of Europe

## Asia Pacific

China

India

Japan

Australia

South Korea

Rest of Asia Pacific

## Latin America

Brazil

Mexico

## Middle East & Africa

UAE

Saudi Arabia

South Africa

Rest of Middle East & Africa

## Key Takeaways:

Market Estimates & Forecast for 10 years from 2025 to 2035.

Annualized revenues and regional level analysis for each market segment.

Detailed analysis of geographical landscape with Country level analysis of major regions.

Competitive landscape with information on major players in the market.

Analysis of key business strategies and recommendations on future market approach.

Analysis of competitive structure of the market.

Demand side and supply side analysis of the market.

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