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Direct Drive Wind Turbine Market By Capacity (Less than 1MW, 1MW to 3MW, More than 3MW) , By Technology (Permanent Magnet Synchronous Generator (PMSG) , Electrically Excited Synchronous Generator (EESG)) By Installation (Offshore, Onshore) By End Use (Industrial, Commercial, Residential, Utility) : Global Opportunity Analysis and Industry Forecast, 2024-2030

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Abstracts

Direct Drive Wind Turbine Market

The direct drive wind turbine market was valued at $15.4 billion in 2023 and is projected to reach $31.7 billion by 2030, growing at a CAGR of 10.9% from 2024 to 2030.

A direct drive wind turbine is a gearbox-free power production technology that generates electrical energy from the kinetic energy of wind. In this type, the rotor is directly connected to the generator, eliminating the risk of gearbox failure and loss of transmission. The major advantages of generating electricity from direct drive wind turbines include high reliability, low maintenance requirements, improved efficiency, and extended lifespan.

Rise in demand for reliable & sustainable power generation systems is a key driver of the direct drive wind turbine market. In addition, increase in the efficiency of direct drive wind turbines owing to the elimination of gearboxes has fueled their adoption and propelled the growth of the market. A notable trend acquiring traction in the direct drive wind turbine market is the assimilation of smart control systems to improve performance

and facilitate predictive maintenance. The deployment of capabilities of AI, big data analytics, and the Internet of Things is projected to optimize the operations of these turbines.

However, high torque requirements of these turbines necessitate the use of large, heavy generators. This increases the upfront costs associated with direct drive wind turbines, restraining the development of the market. Moreover, the scaling of wind technology is a technically complex and expensive process, which hampers the market growth significantly. On the contrary, upsurge in efforts by several nations to become climate-neutral and utilize wind energy to accomplish a significant portion of this target is anticipated to open new avenues for the direct drive wind turbine market. For instance, it is estimated that wind energy holds the capacity to cater to approximately 35% of electricity demand in the U.S. by 2050. Therefore, boost in recognition regarding the potential of wind energy is poised to open new avenues for the market.

Segment Review

The direct drive wind turbine market is segmented into capacity, technology, installation, end use, and region. On the basis of capacity, the market is divided into less than 1MW, 1MW to 3MW, and more than 3MW. Depending on technology, it is bifurcated into permanent magnet synchronous generator (PMSG) and electrically excited synchronous generator (EESG). As per installation, it is classified into offshore and onshore. According to end use, it is categorized into industrial, commercial, residential, and utility. Region wise, it is analyzed across North America, Europe, Asia-Pacific, and LAMEA.

Key Findings

On the basis of capacity, the more than 3MW segment held a high share of the market in 2023.

Depending on technology, the permanent magnet synchronous generator (PMSG) segment dominated the market share in 2023.

As per installation, the offshore segment acquired a high stake in the market in 2023.

According to end use, the utility segment accounted for a high share of the market in 2023.

Region wise, Asia-Pacific was the highest revenue generator in 2023.

Competition Analysis

The major players of the global direct drive wind turbine market include Siemens Gamesa Renewable Energy, S.A.U., Goldwind, GE VERNOVA, ENERCON Global GmbH, Nordex SE, Senvion India Pvt. Ltd., Hitachi Energy Ltd., ABB Ltd., Voith GmbH & Co. KGaA, and Emergya Wind Technologies BV. These major players have adopted various key development strategies such as business expansion, new product launches, and partnerships to strengthen their foothold in the competitive market.

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Analysis of raw material in a product (by %)

Capital Investment breakdown

End user preferences and pain points

Investment Opportunities

Supply Chain Analysis & Vendor Margins

Technology Trend Analysis

Go To Market Strategy

New Product Development/ Product Matrix of Key Players

Regulatory Guidelines

Additional company profiles with specific to client's interest

Additional country or region analysis- market size and forecast

Criss-cross segment analysis- market size and forecast

Key player details (including location, contact details, supplier/vendor network etc. in excel format)

List of customers/consumers/raw material suppliers- value chain analysis

Market share analysis of players at global/region/country level

SWOT Analysis

Key Market Segments

By Capacity

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Less than 1MW

1MW to 3MW

More than 3MW

By Technology

Permanent Magnet Synchronous Generator (PMSG)

Electrically Excited Synchronous Generator (EESG)

By Installation

Offshore

Onshore

By End Use

Industrial

Commercial

Residential

Utility

By Region

North America

U.S.

Canada

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Mexico

Europe

France

Germany

Italy

Spain

UK

Rest of Europe

Asia-Pacific

China

Japan

India

South Korea

Australia

Rest of Asia-Pacific

LAMEA

Brazil

South Africa

Saudi Arabia

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Rest of LAMEA

Key Market Players

Siemens Gamesa Renewable Energy, S.A.U.

Goldwind

GE VERNOVA

ENERCON Global GmbH

Nordex SE

Senvion India Pvt. Ltd.

Hitachi Energy Ltd.

ABB Ltd

Voith GmbH & Co. KGaA

Emergya Wind Technologies BV

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