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Global Wind Turbine Market: Analysis By Location (Onshore and Offshore), By Axis (Horizontal and Vertical), By Component (Rotator Blade, Generator, Gearbox, Nacelle and Others), By Application (Utility and Non Utility), By Region, Size and Trends with Impact of COVID-19 and Forecast up to 2026

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Abstracts

The global wind turbine market was valued at US$70.54 billion in 2021, and is expected to be worth US$94.26 billion in 2026. Wind power is a type of renewable energy. As various governments are adopting initiatives to combat the climate change renewable energy is experiencing great growth. Compared to many other energy sources, producing energy from the wind has lesser impact on the environment. With few exceptions, wind turbines do not emit pollutants that can harm the environment. Additionally, wind turbines may lessen the amount of fossil fuels used to generate energy, which lowers overall air pollution and carbon dioxide emissions.

Wind turbines are mechanical devices used in wind power plants. Wind turbine uses the aerodynamic force of rotor blades, which function similarly to an aero plane wing or a helicopter rotor blade, to transform wind energy into electricity. The wind turbine market is determined to grow at a CAGR of 5.97% over the forecasted period of 2022-2026.

Market Segmentation Analysis:

By Location: The report identifies two segments on the basis of location: Onshore and Offshore. Among the location, it is anticipated that the offshore location would experience a significant growth, rising at a CAGR of 7.76%. Advantages of the offshore wind turbine include increased power output as a result of steady wind flow and speedy

installation of the turbines. As large corporations in the nations turn to adopting renewable and clean energy sources, the installation of offshore wind turbines is anticipated to increase during the forecast period. The global offshore wind turbine market can be divided in two segments, on the basis of installation: Fixed and Floating. In 2021, fixed wind turbine dominated the global offshore wind turbine market with a share of 93.7%.

By Axis: The report identifies two segments on the basis of axis: Horizontal Axis and Vertical Axis. Among the axis, it is anticipated that the vertical wind turbines would experience the highest CAGR of more than 8% during the forecasted period due to their capacity to produce power efficiently in unstable and harsh situations. Some of the essential factors that would propel the demand for the vertical wind turbines across residential applications are low installation and maintenance costs, limited ground requirements, and ease of operation.

By Component: The report provides the bifurcation of wind turbine market into five segments on the basis of components: Rotator Blade, Generator, Gearbox, Nacelle and Others. The rotator blade segment dominated the market in 2021, with a share of around 31%, Wind turbine rotator blades are airfoil-shaped blades that utilize wind energy to move the rotator of the wind turbine. The blades may exert lift in the opposite direction of the wind due to the airfoil-shaped design. The wind turbine is propelled by this force vector, which acts on the rotor. Growing competition among industry participants to enhance production capacity has led to a significant decrease in the price of rotator blades, which has increased its installation.

By Application: The report identifies two segments on the basis of applications: Utility and Non Utility. Among the application, utility segment dominated the market in 2021, captured a share of around 86%. Utility-scale wind turbines are often erected in sizable wind farms with several turbines that are linked to the country's transmission network. Large-scale utility-scale wind generating projects necessitate several land, building, and other permissions in addition to careful relationship management with various process players. Increasing rotator blade size, increasing area of wind farms, increasing efficiency of wind turbines along declining costs are the factors foreseen to drive the growth of utility wind turbine market in coming years.

By Region: In the report, the global wind turbine market is divided into five regions: Asia Pacific, Europe, North America, Latin America and Middle east and Africa. Asia Pacific accounted for the largest share of around 42% in the global wind turbine market in 2021. Asia-installed Pacific's wind capacity climbed from 283 GW in 2019 to 336 GW in

2020. The growth in wind capacity has mostly been driven by China's installed capacity. With roughly 38 GW of installed wind power in 2020, India will hold the fourth-largest position globally. By 2022, the government hopes to have 60 GW of onshore wind and 5 GW of offshore wind installed. To reach this goal, it is anticipated that there will be a significant increase in the number of projects during the next two years.

Market Dynamics:

Growth Drivers: One of the key drivers of the market's expansion is an increase in investments in wind power generation. The market will be driven in the upcoming years by the various wind projects that are currently under construction and will eventually be completed. Other significant growth factors of the market include declining Levelized Cost of Energy (LCOE), federal and state policy support, road to net zero, wind turbine financing, etc.

Challenges: However, some challenges are impeding the growth of the market such as high entry barriers, high maintenance and challenges with turbine blades. The challenges associated with the design, manufacture, and usage of wind assets include corrosion, fatigue, erosion, lightning strikes, and biofouling, to name just a few. Challenges with the foundations and transition piece have negatively affected the wind turbine market.

Trends: The market is projected to grow at a fast pace during the forecast period, due to various latest trends such as increasing average turbine size, power to X and green hydrogen, increasing distance to shore and greater water depths, and technological advancements. Another significant trend is the relocation of offshore wind farms farther from the coast in order to take advantage of improved wind conditions and as a result of the exhaustion of near-shore locations. The offshore wind farms are near to the shore, yet there is often a lengthy distance to the port in markets like Taiwan. Similar trends are being observed in the US, where the offshore wind farm may be located in a different state than where it sells its power. Generally, deeper water is found where there is a larger distance from the shore. Technological advancements have made bottom-fixed offshore wind possible at deeper sea depths.

Impact Analysis of COVID-19 and Way Forward:

Like many sectors, COVID-19 has also impacted the energy sector and threatened to derail efforts implemented to speed up the transition to clean energy. Supply and demand shocks have occurred across the energy sector as a result of widespread economic activity suspension. The wind turbine market, was also imparted by the pandemic in the initial stage due to investment curbs and supply chain disruptions caused through unavailability of workforce. But in the 2nd half, the impact of the pandemic was alleviated by favorable government policies and robust demand pulled by increased awareness of the people towards clean energy sources.

Energy is a crucial component of economic development and prosperity. The demand for energy always increases as the society advances. Despite the fact that pandemic caused serious issues in the energy sector, the move towards the clean sources of energy has sparked unprecedented interest in the wind power, thus driving the growth of wind turbine market.

Competitive Landscape:

The global wind turbine market is moderately concentrated. Market players have implemented sustainable growth techniques in the market. To strengthen their position in the market, some of the leading competitors are pursuing various growth methods such as mergers, acquisitions, collaborations, and agreements.

The key players in the global Wind turbine market are:

General Electric Company (GE) (GE Renewable Energy)

Vestas Wind Systems A/S

Siemens Gamesa Renewable Energy

Nordex SE

Suzlon Energy Ltd.

XinJiang Goldwind Science & Technology Co., Ltd.

Guodian Technology & Environment Group Corporation Ltd. (Guodian United Power Technology Ltd.)

Shanghai Electric Group Company Ltd.

Ming Yang Smart Energy Group Ltd.

Enercon GmbH

Envision Energy

Zhejiang Windey Co., Ltd.

To achieve competitive advantage, businesses are placing a strong emphasis on research and development (R&D). For instance, Siemens Gamesa took steps in March 2020 to maintain the high level of activity across the business segment for the manufacturing, installation, and service of wind turbines. The companies are working assiduously to ensure continuity and to reduce risk in the sophisticated supply chain that underpins the wind turbine market. Additionally, organizations' installation and service-providing teams oversee the intricate international logistics, keep an eye on all borders, and uphold travel restrictions to ensure safer delivery.

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