Small Wind Turbine Market - Growth, Trends, Covid-19 Impact, and Forecasts (2023 - 2028)

Market Report | 2023-01-23 | 133 pages | Mordor Intelligence

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Report description:

The small wind turbine market was valued at USD 277.4 million in 2020, and it is anticipated to reach USD 309 million by 2027, at a CAGR of 1.19% during 2022-2027. The COVID-19 pandemic did not have any major impact on the market during 2020. Factors such as lower CAPEX requirements, rising environmental concerns, and demand from off-grid applications are expected to drive the market. Also, advancements in technology leading to wind turbine manufacturing cost reduction and increase in efficiency have been major factors for the growth of the small wind turbine market. However, the increasing adoption of alternative energy sources for small-scale renewable development, such as rooftop solar and small-scale bioenergy facilities, is expected to hinder the growth of the market during the forecast period.

Key Highlights
The horizontal axis wind turbine segment dominated the market in 2021, and it is expected to grow with the same trend during the forecast period.
The deployment of small wind turbines atop high-rise buildings has been investigated and implemented in limited capacities across many Western countries. This can redefine renewable energy generation and consumption in urban neighborhoods with a high carbon footprint, thus creating several opportunities for small wind turbines in the future.
Asia-Pacific is expected to dominate the market's growth, with the majority of the demand coming from countries such as China and India.

Small Wind Turbine Market Trends

The Horizontal Axis Wind Turbine Segment is Expected to Dominate the Market

The horizontal axis wind turbine (HAWT) has the main rotor shaft and electrical generator at the top of the tower, and it may be pointed toward or away from the prevailing wind by a simple wind vane. ?
The horizontal axis wind turbine segment has a significant share in the small wind turbine market. It has been in production for more than three decades, whereas most small vertical axis wind turbines (VAWTs) were produced in the last ten years. The small HWAT receives impetus due to techno-economic benefits associated with the same. The small horizontal axis wind turbine at high-speed wind benefits low-cost wind energy generation, devoid of a skilled workforce and easy maintenance.?
Furthermore, there are two types of small HAWTs. The first one includes a typical three-bladed design, and the second one is an aerodynamically complex, shrouded HAWT. Both the types have a similar rate power of approximately 3 kW.
An advantage of the small HAWTs is the tall tower base, which allows them to gain stronger access to wind at sites with wind shear (sites where variation in wind velocity occurs in the direction at right angles to the wind's direction and tends to exert a turning force). This results in increased power generation due to stronger wind access. This is likely to result in moderate deployment of these units during the forecast timeline.
In April 2021, Engie partnered with Eocycle-XANT to offer a small wind turbine as part of a portfolio of decentralized green energy systems for customers in Belgium. The 90kW EOX M-26 wind turbine produces an average of 260 megawatt-hours of clean electricity a year. The horizontal axis wind turbine has a tip height of 51 meters and requires an environmental permit for its installation.
Therefore, owing to the above points, the horizontal axis wind turbine segment is expected to dominate the market during the forecast period.

Asia-Pacific is Expected to Dominate the Market

Asia-Pacific dominated the wind power generation market in 2021, and it is expected to continue its dominance in the coming years as well. The region holds vast potential for the expansion of the small wind turbine market, notably in the form of off-grid and residential-scale small wind turbines.
China holds the largest wind power generation capacity globally, with 288.3 GW of installed capacity as of 2020. The country installed 25.65 MW of SWTs in 2020, reaching a cumulative installed capacity of 610.6 MW.? The country first introduced FiT from onshore wind in 2009; it currently offers FiT for small wind turbines ranging from EUR 13.4-20.1 ct/kWh.
The government of China has been encouraging the deployment of small wind power since the early 1980s. It is one of the few emerging economies to develop in this sector actively. Chinese SWT application is shifting from rural electrification oriented to city streets illumination and telecom stand-alone power systems. It is developing rapidly in these new application fields.?
On the other hand, India holds the fourth-largest wind power installed capacity in the world. As of 2020, the country's winds power installed capacity stood at 38.6 GW. ?The potential for wind power generation for grid interaction has been estimated at 1,02,788 MW, taking sites having a wind power density greater than 200 W/sq. m at 80 m hub-height with 2% land availability in potential areas for setting up wind farms @ 9 MW/sq. km.?
As far as SWTs are concerned, almost all the systems installed in India are off-grid or stand-alone. Maharashtra has the majority of the SWT installations in the country. The otherwise "windy" states like Tamil Nadu and Gujarat fare poorly in SWT installations. As of March 2019, small wind energy systems of around 3 MW have been installed in 23 States/UTs.
Therefore, owing to the above points, Asia-Pacific is expected to dominate the small wind turbine market during the forecast period.

Small Wind Turbine Market Competitor Analysis

The small wind turbine market is moderately fragmented. Some of the major players operating in the market include Northern Power Systems Srl, Bergey Wind Power Co., SD Wind Energy, Aeolos Wind Energy Ltd, and Ryse Energy, among others.

Additional Benefits:

The market estimate (ME) sheet in Excel format
3 months of analyst support

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