

Hybrid Power Solutions Market – Global Industry Size, Share, Trends, Opportunity, and Forecast, 2018-2028F Segmented By System Type (Solar-diesel, Wind-diesel, Solar-wind-diesel, Others), By Power Rating (Up to 10 kW, 11 kW–100 kW, and Above 100 kW), By End-Users (Residential, Commercial, Telecom, and Others), By Region

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Abstracts

Global hybrid power solutions market is expected to thrive during the forecast period 2024-2028. Hybrid power sources combine different power generation technologies. The term 'hybrid' in energy technology refers to a combination of electricity and energy storage systems. Examples of generators used in hybrid energy include photovoltaics, wind turbines, and various types of motor generators. Hybrid power plants often include renewable energy components (such as PV) that are balanced through a second form of generation or storage such as diesel gensets, fuel cells, or battery systems. Some applications can also provide other forms of energy, such as heat. Hybrid systems, as the name suggests, combine two or more types of power generation, typically using renewable technologies such as photovoltaics (PV) and wind turbines. Hybrid energy systems are more reliable and secure than traditional power systems because they use a variety of energy sources. This means that they are less likely to be affected by disruptions in any one source. Hybrid systems often include storage systems, such as batteries or fuel cells, to further improve reliability. In some cases, they may also include a small fossil fuel generator as a backup.

Hybrid power systems are becoming more popular for powering remote areas because they are more reliable and affordable than traditional fossil fuel-based systems. Advances in hybrid technology have made it possible to generate

Electricity from solar, wind, and other renewable sources at a lower cost than conventional. Additionally, the rising price of petroleum products has made it more expensive to operate diesel generators that are often used to power remote areas. A hybrid energy system or hybrid power usually consists of two or more renewable energy sources used together to ensure higher system efficiency and a more balanced energy supply.

A common type is a photovoltaic-diesel hybrid system that combines a photovoltaic (PV) with a diesel generator or a diesel generator. This is because PV has little marginal cost and is preferred on the grid. Diesel assemblies are used to continuously bridge the gap between the current load and the power actually produced by the photovoltaic system. Because solar power is variable and diesel generators are limited to a certain range of power generation capacity, storage batteries are often used to optimize the contribution of solar power to the overall power generation of a hybrid system.

A wind-diesel hybrid power generation system combines a diesel generator and a wind turbine, usually with ancillary equipment such as energy storage, power converters, and various control components to generate electricity. They are designed to increase power generation capacity in remote communities and facilities that are not connected to the grid, reducing power generation costs and environmental impacts.

Wide Usage of Technology Propels Market Growth

One of the key market drivers is the ability of hybrid power solutions to reduce pollution and CO₂ emissions. Another market driver is the reduction in fuel consumption in the power generation sector. Additionally, the pursuit of more advanced and sustainable energy sources is a major driver of the market. For instance, China and the United States are focusing on using sustainable renewable energy sources. These are influencing rich countries to deploy alternative energy sources such as wind, solar, and hybrid energy solutions under different conditions.

The technology-driven hybrid power systems are characterized by high acquisition costs and low conversion costs. In developing countries, the demand for and adoption of hybrid propulsion systems are increasing due to the number of component manufacturers and various government incentives. The construction of these grids has recently increased due to the instability and lack of access to these grids in remote and rural areas. As renewable energy sources become popular, more energy companies are focusing on generating electricity from solar, wind, hydro, and fuel cells. Hybrid power solutions are becoming increasingly important in today's edge power generation due to

their superior qualities such as low carbon emissions, abundant supply, and cost efficiency. A key factor driving the projected growth of the global hybrid power solutions market is the ability of hybrid powertrain systems to deliver maximum performance while reducing fuel consumption.

The market for hybrid power solutions is significantly impacted by the rapid rise of hybrid power generation in off-grid regions. As a result, during the predicted period of 2024–2028, rising political pressure to reduce CO₂ emissions as well as low operating and maintenance costs and supportive governmental measures are also significant growth drivers. The market for hybrid power solutions is expanding favorably as a result of rising demand for both clean energy and off-grid electricity. The quick expansion of hybrid power generation in off-grid areas has a substantial impact on the market for hybrid power solutions. As a result, increasing political pressure to cut CO₂ emissions, as well as low operating and maintenance costs and beneficial governmental initiatives, will serve as important growth drivers during the anticipated period. Due to the increased need for both clean energy and off-grid electricity, the market for hybrid power solutions is expanding favorably.

The growing acceptance of renewable energies and the electrification of rural areas through hybrid power solutions are expected to drive the growth of the market during the forecast period. This will result in increased revenue opportunities within the hybrid power solutions market, fueled by the rising demand for clean energy generation and competition from global industry players. The increasing popularity of hybrid solutions can be attributed to their exceptional characteristics in reducing carbon emissions and maximizing output with minimal fuel consumption. Additionally, the market has witnessed a shift toward hybrid power solutions due to heightened awareness of the environmental impact of global warming.

Latest investments fueling the growth of the global refractories market

India launched a 30GW power project in 2022. A solar-wind hybrid power generation system is expected to achieve an output of 30GW. The country aims to increase its renewable energy capacity to 175GW by 2022 and 450GW by 2030. Currently, the largest solar PV system is installed at 2.25 GW Bhadra Solar Park in Rajasthan, although plans for larger systems already exist. The land required for establishing the power generation system was sold to companies such as Solar Energy Corporation Government of India (SECI), energy company NTPC, power producer Adani Power, and wind turbine manufacturer Suzlon and Gujarat-based GSEC and GIPCL.

In April 2023, Vibrant Energy, a developer of renewable energy solutions for enterprises, secured project financing of over INR 220 crore (USD 30.8 million) from Power Finance Corporation Ltd. (PFC). The funding will help the company build 300MW(AC) wind-solar hybrid projects in Madhya Pradesh and Karnataka. Vibrant Energy claims the loan will be the largest project financing in India's renewable energy industry in 2023. PFC is India's leading public company and a leading non-bank financial institution owned by the Ministry of Energy. Vibrant Energy, a Macquarie Asset Management Green Investment Group (MAMGIG) portfolio company, currently operates and delivers over 2GW of renewable energy solutions to businesses. Danish wind energy group Vestas and Hyderabad-based company Vibrant Energy have signed contracts for two wind projects in India. Vestas will supply 36 of his V155-3.6 MW turbines as part of the order.

Levandpol Group's 200MW project is touted as Poland's first large-scale power plant combining solar and wind power with n-type solar panels, with a subordinated loan of up to USD 21 million until January 2023 (dollars from the fund). It is operated by the state-owned financial group Polski Fundus Rozwoju (PFR). The Levanpol Group in Poland is building a 200MW solar and wind farm with n-type solar modules. The site will be built in a former mining area in the Konin district and Phase I is planned to connect a 193 MW photovoltaic system and a 19.2 MW wind turbine to the grid. A second phase expansion can include expanding solar power to around 250 MW, adding wind turbines and a warehouse. According to PFR, the Kretyev solar and wind farm will be one of the largest renewable energy parks in Central and Eastern Europe. It is planned to be built in a former mining area in the Konin district of Greater Poland.

Market Segmentation

The global hybrid power solutions market is segmented on the system type, end-users, power rating and region. Based on system type, the market is bifurcated into solar-diesel, wind-diesel, solar-wind-diesel and others. Based on end-users, the market is further bifurcated into residential, commercial, telecom and others. Based on power rating, the market is bifurcated into up to 10 kw, 11 kw–100 kw and above 100 kw. Based on region, the market is further bifurcated into North America, Asia-Pacific, Europe, South America, and Middle East & Africa.

Market player

Major market players in the global hybrid power solutions market are Siemens Gamesa Renewable Energy SA, General Electric Company (GE), Huawei Technologies Co., Ltd., Eltek Ltd., SMA Solar Technology AG, Vergnet SA, Clear Blue Technologies Inc., Man Energy Solutions SE, Iberdrola, S.A., and Suzlon Energy Limited.

Report Scope:

In this report, the global hybrid power solutions market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Hybrid Power Solutions Market, By System Type:

Solar-diesel

Wind-diesel

Solar-wind-diesel

Others

Hybrid Power Solutions Market, By Power Rating:

Up to 10 kW

11 kW–100 kW

Above 100 kW

Hybrid Power Solutions Market, By End-Users:

Residential

Commercial

Telecom

Others

Hybrid Power Solutions Market, By Region:

North America

United States

Canada

Mexico

Asia-Pacific

China

India

Japan

South Korea

Australia

Europe

Germany

United Kingdom

France

Spain

Italy

South America

Brazil

Argentina

Colombia

Middle East

Saudi Arabia

South Africa

UAE

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the global hybrid power solutions market.

Available Customizations:

With the given market data, Tech Sci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

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