

Global Solar Inverter Market: Analysis By Type (Central, String and Micro), By Phase (Three Phase and Single Phase), By Connection Type (On Grid and Off Grid), By End User (Utilities, Residential and Commercial & Industrial), By Region Size & Forecast with Impact Analysis of COVID-19 and Forecast up to 2028

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Abstracts

A solar PV inverter is a power inverter that converts electricity from a photovoltaic (PV) solar panel in direct current (DC) to alternating current (AC) at utility frequency. This can be utilized for residential and business electrical grids, as well as a local off-grid electrical network like micro grids. Upgrades to solar inverters can help 1) improve DC-AC power conversion efficiency, and 2) maximize solar power output. All else being equal for a solar system, upgrades to solar inverters can help increase solar power generation by 5-10%. In 2022, the global solar inverter market was valued at US\$11.49 billion, and is probable to reach US\$21.34 billion by 2028.

The growing demand for solar power is expected to drive the expansion of the solar PV inverters market. Increased investments and ambitious solar energy targets are projected to boost the market's growth. The solar inverter demand would increase, driven by the global solar installations, demand from utility scale projects and the replacement demand of old solar inverters. The global solar inverter market value is projected to grow at a CAGR of 10.87 %, during the forecast period of 2023-2028.

Market Segmentation Analysis:

By Type: The global solar inverter market is segmented into three type: String, Central

and Micro. String segment acquired majority of share in the market in 2022. String inverters are very reliable with timely maintenance and adaptable enough to be installed in a secure location. Furthermore, string-type inverters are ideal for commercial and residential applications, including modest utility installations of less than 1 MW.

By Phase: The global solar inverter market is bifurcated into two phases: Three Phase and Single Phase. Three Phase segment acquired majority of share in the market in 2022, as the expansion in the demand of three phase solar inverter can be due to the increasing importance of the power generating, distribution, and transmission sectors. Whereas, Single Phase segment is expected to have the highest CAGR in the future as residential users usually utilize single-phase power supply. Single-phase solar inverters are commonly utilized in small-scale and domestic solar installations. As demand for home solar systems grows, so does the demand for single-phase inverters.

By Connection Type: According to the report, the global solar inverter market is bifurcated into two connection type: On Grid and Off Grid. On Grid segment acquired majority of share in the market in 2022, as the advantages of using on-grid solar inverters include easy energy feeding, easy installation, cost-efficiency, and managing high electricity demand, all of which are projected to fuel market expansion in the coming years. Whereas, Off Grid segment is expected to have the highest CAGR in the future as Off-grid solar inverters are in charge of converting the direct current (DC) electricity generated by solar panels into usable alternating current (AC) electricity for powering off-grid appliances and devices.

By End User: According to the report, the global solar inverter market is bifurcated into three end users: Utilities, Residential and Commercial & Industrial. Utilities segment acquired majority of share in the market in 2022, because investment in utility-scale solar power plants, solar parks, and other solar structures has increased. Whereas, Residential segment is expected to have the highest CAGR in the future as the increased demand for solar renewable energy among consumers for electrification purposes. Governments in various countries have taken active steps with policies and financial incentives to promote captive power generation through renewable sources such as power in residential buildings.

By Region: The report provides insight into the solar inverter market based on the geographical operations, namely North America, Europe, Asia Pacific, and Rest of the World. Asia Pacific solar inverter market enjoyed the highest market share in 2022, primarily due to the existence of significant players as well as a large consumer base in the region. Furthermore, the expansion of the renewable energy sector, increased

investment in upgrading aging power infrastructure, and industrialization in the region are expected to fuel market growth in the coming years. The majority of demand is predicted to come from China, which is also the greatest producer of solar energy. China is the main contributor to this region's quick expansion in the solar sector and a prominent global competitor. A growing number of solar installations in developing countries has also contributed significantly to the region's market growth. In China, there has been a greater emphasis on solar inverters that provide a zero-voltage ride through (ZVRT) system. To meet the scheme's requirements, the solar PV power plants must operate continuously. This is especially significant given that the country has the most solar power generation capacity in the world.

Global Solar Inverter Market Dynamics:

Growth Drivers: Solar inverters, like any other electronic gear, have a limited lifespan and may need to be replaced after a given amount of time. As the installed base of solar power systems grows, the requirement to replace aging inverters grows, boosting demand for replacement inverters. Further, the market is expected to increase due to growing replacement demand for solar inverters, mounting home improvement, rapid urbanization, rising number of solar installations attributed to government-led incentives and schemes, increasing power failures, etc.

Challenges: High costs make it difficult to make solar energy accessible and affordable to a broader variety of users. Individuals and enterprises in underdeveloped countries or regions with minimal financial resources are included. Lowering the cost of solar inverters can assist to boost the affordability of solar energy solutions and make them available to more communities throughout the world. The other challenge that solar inverter market faces is safety risks associated with high DC voltages, high cost of solar inverters, etc.

Trends: A major trend gaining pace in solar inverter market is sustainability. Sustainability is a major motivator for the global shift toward renewable energy sources. Solar energy, as a clean and abundant renewable energy source, plays an important part in this shift. Solar inverters are crucial components of solar power systems because they transform the direct current produced by solar panels into usable alternating current. More trends in the market are believed to augment the growth of solar inverter market during the forecasted period include, inflation reduction act (IRA), smart solar inverters, expansion of companies in ESS market, etc.

Impact Analysis of COVID-19 and Way Forward:

Lockdowns implemented as a result of the COVID-19 epidemic led in a temporary prohibition on import and export, as well as manufacturing and processing activities across different industries, reducing demand for power equipment and affected the solar inverter market. As a result, market growth had declined in 2020. The solar inverter market, on the other hand, is likely to recover by the end of 2021, as COVID-19 immunization has begun in several economies around the world, which is expected to help the situation globally. The COVID-19 epidemic stifled global solar inverter market expansion due to reasons such as supply chain disruption. Furthermore, demand for PV inverters from residential and commercial End-Users has decreased due to limited new building activities and the diversion of available cash by residential and commercial end-users to sustain during the COVID-19 epidemic.

Competitive Landscape and Recent Developments:

Global solar inverter market is concentrated, with the top two players consisting of Huawei and Sungrow accounted for around 45% share of the market. Sungrow is the world's second-largest maker of solar inverters and China's largest energy storage systems (ESS) supplier, in terms of 2021 shipments. Key players of global solar inverter market are:

Schneider Electric SE

SolarEdge Technologies, Inc.

Delta Electronics, Inc.

GoodWe

Sineng Electric Co., Ltd.

Huawei Investment & Holding Co. Ltd.

Sungrow Power Supply Co., Ltd.

SMA Solar Technology AG

FIMER S.p.A.

Growatt

Power Electronics

Hitachi Hi-Rel Power Electronics Private Limited

Yaskawa Solectria Solar

Ginlong (Solis) Technologies

The key players are constantly investing in strategic initiatives, such as new product launches, introducing their products to emerging markets and more, to maintain a competitive edge in this market. For instance, In April 2022, SMA Solar Technology AG, a German inverter manufacturer, launched a new line of four inverters with power ratings of 12kW, 15kW, 20kW, and 25kW for use in rooftop PV systems up to 135kW in size. Also, in May 2022, Fimer Spa, an Italy-headquartered solar PV inverter manufacturer, supplied 1 Mega Volt Ampere (MVA) inverters to a solar-plus-storage project with an 18MWh battery energy storage system in Gujarat, India. The company supplied its inverters to the Integrated Solar Energy Project in Modhera. The project belonged to Indian solar PV engineering, procurement, and construction (EPC) solution provider Mahindra Susten Pvt. Ltd and was awarded by the state's utility, Gujarat Power Corporation Limited (GPCL).

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