

# Solar Power Boom Drives PV Inverter Market to \$17.9 Billion by 2030

*The solar PV inverter market is growing with renewable energy expansion and easy installation, though heat loss and limited monitoring hinder progress.*

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According to a new report published by Allied Market Research titled, "Solar (PV) Inverter Market by Product Type, Connection Type, Phase and End User: Global Opportunity Analysis and Industry Forecast, 2021–2030," the

solar (PV) inverter market size was valued at \$7.7 billion in 2020, and is projected to reach \$17.9 billion by 2030, growing at a CAGR of 8.8% from 2021 to 2030.



A solar inverter is an essential device that converts the direct current (DC) electricity generated by solar panels into alternating current (AC), which is suitable for use in residential, commercial, and industrial applications. It ensures that the [power from solar panels](#) can be used to operate household appliances and other grid-compatible systems. Typically connected to multiple solar panels, the inverter optimizes their performance by regulating output levels consistently.

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Solar inverters are the heart of photovoltaic systems, enabling clean energy conversion while driving the global shift toward sustainable and decentralized power solutions.”

*Allied Market Research*

Solar inverters comprise key components such as voltage regulators, step-up transformers, and other electronic systems that manage energy conversion efficiently. They offer numerous benefits, including lower electricity bills,

reduced environmental impact, and higher energy efficiency compared to traditional diesel generators. These advantages make solar inverters a preferred choice in sustainable energy systems, contributing to the broader adoption of solar technology worldwide.

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## Market Dynamics

The solar (PV) inverter market is witnessing strong growth, driven by the rapid development of end-use industries such as oil & gas, telecom, mining, pharmaceuticals, chemicals, and healthcare. These industries increasingly rely on off-grid solar installations to ensure a stable and independent power supply, particularly in remote or energy-deficient locations. The ability of solar inverters to deliver clean, reliable, and cost-effective electricity makes them a preferred choice for sustaining continuous operations in these sectors.

Emerging economies like India, China, and Japan are playing a pivotal role in fueling global market expansion. Rising energy demand, supportive government policies, and ambitious renewable energy targets are encouraging widespread adoption of solar power systems, thereby boosting the demand for efficient and high-performance inverters. Government incentives, subsidies, and initiatives like India's PM-KUSUM and China's solar development programs are particularly driving large-scale solar deployments across both urban and rural areas.

Technological advancements in inverter design are also acting as significant market drivers. The emergence of string inverters, microinverters, and hybrid inverters with features like MPPT (Maximum Power Point Tracking), remote monitoring, and smart grid integration are improving system efficiency and reliability. Innovations in compact design, energy storage compatibility, and faster installation are making inverters more user-friendly and suitable for residential, commercial, and utility-scale applications.

Moreover, the increasing emphasis on reducing carbon emissions and dependence on fossil fuels is pushing both governments and corporations to invest heavily in solar infrastructure. Solar inverters, being a crucial component of any photovoltaic system, are benefiting from the global shift toward renewable energy. Industries are increasingly adopting solar-powered systems not just for cost savings but also to align with ESG (Environmental, Social, and Governance) goals and sustainability commitments.

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However, the market does face certain challenges. High heat generation from large-size solar inverters can lead to efficiency losses and reduce product lifespan, especially in regions with high ambient temperatures. Additionally, inconsistent solar panel orientation in large installations, such as those on rooftops or uneven terrains, can affect inverter performance and energy yield. Addressing these limitations through better thermal management and adaptive technologies will be key to sustaining long-term market growth.

## Segment Overview

The [solar inverter market analysis](#) is primarily segmented by type into central, string, and microinverters—with string inverters leading in share (~47–49%), central inverters dominating utility-scale, and microinverters gaining rapid traction in residential settings due to panel-level

optimization and shading resistance. It's also divided by end users—utilities, commercial & industrial, and residential—where utility-scale installations presently hold the largest share (~46%). Additionally, inverters are categorized by application type—on-grid, off-grid, and hybrid—with on-grid systems being most prevalent. Output power ratings further segment the market, ranging from below 10 kW (popular for residential use) through mega-watt systems for utility projects, water treatment, and commercial infrastructure. Among these, the manufacturing and energy sectors are major contributors, driven by increased adoption of automated systems and the need for reliable power distribution and system monitoring.

### Regional Analysis

Asia-Pacific holds the largest share in the solar inverter market, primarily driven by high solar power generation targets, declining costs of photovoltaic technology, and strong policy support from governments. Countries like China, India, and Japan are leading in solar installations, with China dominating both inverter manufacturing and deployment due to its massive utility-scale solar projects and global export strength. India's market is also expanding rapidly, supported by initiatives like the National Solar Mission and rural electrification programs. Technological innovation, domestic manufacturing incentives, and increasing residential and commercial solar rooftop installations are boosting demand for both string and hybrid inverters across the region.

In North America, the U.S. is a key contributor to regional growth, backed by federal tax credits, net metering policies, and a growing shift toward residential solar adoption. The market is witnessing rising demand for smart inverters with grid-support functionalities, driven by integration with energy storage systems and electric vehicles. Europe, on the other hand, is focused on grid modernization and sustainability goals under the EU Green Deal. Countries like Germany, Spain, and Italy are embracing decentralized energy generation, with strong uptake of residential and commercial solar inverters. Meanwhile, the Middle East & Africa and Latin America are emerging as high-growth regions due to increasing solar project development in off-grid areas, favorable climate conditions, and international investment in renewable infrastructure.

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### Competitive Analysis

The solar inverter market is highly competitive and characterized by a mix of global giants and regional players striving for technological leadership and market expansion. Major players such as Delta Electronics, Inc., Fimer S.p.A., Fronius International GmbH, Ginlong Technologies, Huawei Technologies Co., Ltd., Shenzhen Growatt New Energy Co., Ltd., Siemens AG, SMA Solar Technology AG, SolarEdge Technologies, Inc., and Sungrow Power Supply Co., Ltd. dominate the landscape with strong R&D capabilities and extensive product portfolios. These companies are focused on developing advanced inverter technologies like hybrid inverters, smart inverters with IoT and AI capabilities, and solutions that support grid stability and energy storage. Their strategic partnerships with solar developers, utilities, and EPC (Engineering, Procurement, and

Construction) contractors allow them to secure large-scale projects and maintain a significant presence in both developed and emerging markets.

Meanwhile, regional and niche players are gaining traction by offering cost-effective and tailored solutions, particularly in high-growth areas like Asia-Pacific, Latin America, and Africa. Companies such as Delta Electronics, Growatt, Fronius International GmbH, Enphase Energy, and GoodWe are carving out market share by focusing on innovation, local manufacturing, and strong after-sales support. The trend toward decentralized energy generation, coupled with the increasing need for energy resilience, is encouraging more investments in residential and commercial solar inverter segments. As the industry evolves, competition is expected to intensify, with key success factors including inverter efficiency, durability in extreme climates, ease of integration with energy storage systems, and compliance with smart grid standards.

#### Key Findings of the Study:

- **String Inverters Dominate the Market:** String inverters hold the largest share due to their cost-effectiveness and scalability, especially in residential and commercial applications.
- **Asia-Pacific Leads Global Demand:** Countries like China, India, and Japan drive the majority of global solar inverter installations, supported by strong policy frameworks and solar capacity expansion.
- **Technological Advancements Fuel Growth:** Innovations such as smart inverters, hybrid systems, and IoT-enabled monitoring are enhancing efficiency, safety, and grid integration capabilities.
- **Utility-Scale Projects are the Primary Revenue Source:** Large-scale solar farms, especially in Asia and the Middle East, account for a significant portion of solar inverter demand due to high-capacity requirements.
- **Off-Grid and Hybrid Systems Gain Traction:** In remote and underserved regions, demand is rising for off-grid and hybrid inverters that support energy independence and storage integration.

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