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String Inverter Market ? Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Phase (Single and Three) By System Type (On-Grid and Off-Grid), By Power Rating (Up to 10kW, 11kW-40kW, 41kW-80kW, and Above 80kW), By End-User (Residential, Commercial & Industrial, and Utilities), By Region & Competition, 2021-2031F

https://marketpublishers.com/r/SC799C3EABABEN.html
Date: January 2026
Pages: 181
Price: US$ 4,500.00 (Single User License)
ID: SC799C3EABABEN

Abstracts

The Global String Inverter Market is projected to expand from USD 5.66 Billion in 2025 to USD 9.45 Billion by 2031, reflecting a CAGR of 8.92%. This market consists of decentralized power conversion units responsible for transforming direct current from photovoltaic strings into grid-compliant alternating current. Growth is primarily fuelled by the scalability inherent in string architecture, which provides superior maximum power point tracking and lower operations and maintenance costs relative to centralized options. This trend is supported by a global surge in renewable energy infrastructure; SolarPower Europe reported that 447 GW of new solar capacity was commissioned in 2023, establishing a solid demand foundation for these conversion components in both utility and commercial sectors.

Nevertheless, market growth faces substantial hurdles due to grid congestion and delays in interconnection. As a significant volume of distributed energy resources connects to the grid, aging electrical infrastructure in established markets struggles to handle the variable load, leading to extensive regulatory backlogs and curtailment risks. This saturation compels network operators to impose rigorous grid-code compliance, resulting in administrative and technical obstacles that delay project commissioning and restrict immediate market access.

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Market Driver

The rapid increase in residential and commercial rooftop solar installations serves as a primary catalyst for the Global String Inverter Market. With decentralized energy generation gaining momentum, string inverters are increasingly preferred for their compact design, scalability, and capacity to manage complex roof shading via multiple Maximum Power Point Trackers (MPPTs). This trend is bolstered by strong deployment in distributed sectors, where precise system monitoring and rapid shutdown compliance are essential. According to the International Energy Agency's 'Renewables 2023' report from January 2024, the commercial, industrial, and residential sectors collectively represented roughly 42% of global solar PV capacity additions in 2023, generating significant demand for both three-phase and single-phase string architectures.

Concurrently, there is a rising preference for string inverters within utility-scale projects, an area historically dominated by central inverters. Developers are increasingly adopting high-power string configurations to optimize energy yield on uneven terrain and reduce downtime through simplified replacement procedures instead of complex field repairs. This shift is taking place amidst massive infrastructure expansion; the National Energy Administration (NEA) of China noted in January 2024 that the country installed approximately 120 GW of utility-scale solar capacity in 2023, greatly expanding the market for high-capacity string solutions. Highlighting this momentum, Sungrow Power Supply Co., Ltd. announced in April 2024 that it achieved global photovoltaic inverter shipments of 130 GW in 2023, emphasizing the industrial scale of component demand.

Market Challenge

Grid congestion and interconnection delays present a significant obstacle to the expansion of the global string inverter market. As the number of decentralized solar projects increases, legacy transmission and distribution networks struggle to manage variable power flows, forcing grid operators to implement strict limits or moratoriums on new connections. This infrastructure bottleneck directly hinders market momentum because string inverters, serving as the essential link between photovoltaic generation and the grid, cannot be activated until interconnection approval is secured. As a result, even after hardware procurement, project timelines face indefinite extensions, delaying revenue for manufacturers and slowing inventory turnover.

The magnitude of this challenge creates a wide gap between potential demand and actual equipment deployment. According to the International Energy Agency in 2024,

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approximately 3,000 gigawatts of renewable energy capacity were stuck in grid connection queues worldwide. This massive backlog suggests that a large portion of the addressable market for string inverters is effectively immobilized in the pre-construction or permitting stages. Until these administrative and physical constraints are resolved, the market will remain unable to fully exploit the underlying demand for renewable energy infrastructure, leaving suppliers to navigate an environment characterized by regulatory uncertainty rather than organic growth.

Market Trends

The widespread adoption of hybrid inverters is transforming the Global String Inverter Market, fueled by the essential requirement to integrate battery energy storage systems (BESS) for improved grid resilience and energy autonomy. In contrast to traditional grid-tied units, hybrid architectures enable bidirectional power flow, permitting residential and commercial users to store surplus photovoltaic energy for peak shaving or emergency backup, thereby softening the effects of grid congestion and interconnection delays. This convergence of solar and storage technologies is fostering a high-growth segment distinct from standard solar cycles. SolarPower Europe?s 'European Market Outlook for Battery Storage 2024-2028', released in June 2024, reports that the European region installed 17.2 GWh of new battery energy storage capacity in 2023, a 94% year-on-year increase that directly boosts demand for these integrated solutions.

At the same time, the utility-scale sector is shifting toward 2000V high-voltage system architectures to achieve greater reductions in the Levelized Cost of Electricity (LCOE). By raising the operating voltage above the standard 1500V, developers can significantly extend string lengths and decrease the number of required cables and combiner boxes, optimizing balance-of-system costs for large infrastructure projects. This technological shift is moving rapidly from concept to commercial use as manufacturers introduce next-generation hardware compatible with these ultra-high voltages. According to Sungrow Power Supply Co., Ltd.'s '2023 Sustainability Report' from May 2024, the company successfully delivered the world's first 2000V inverter for grid-connected power generation, setting a new industry benchmark for efficiency and power density in large-scale solar assets.

Key Market Players

KACO New Energy GmbH

Delta Energy Systems GmbH

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ABB Limited

Fronius International GmbH

SMA Solar Technology AG

Huawei Technologies Co. Ltd.

SolarEdge Technologies Inc.

Growatt New Energy Technology Co. Ltd.

Ginlong Technologies

SolarMax Group

Report Scope

In this report, the Global String Inverter Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

String Inverter Market, By Phase

Single

Three

String Inverter Market, By System Type

On-Grid

Off-Grid

String Inverter Market, By Power Rating

Up to 10kW

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India

Japan

Australia

South Korea

South America

Brazil

Argentina

Colombia

Middle East & Africa

South Africa

Saudi Arabia

UAE

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global String Inverter Market.

Available Customizations:

Global String Inverter Market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

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

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