

Decentralized Inverter Market to Reach USD 99.2 Billion by 2035, Fueled by Solar Adoption and Grid Flexibility

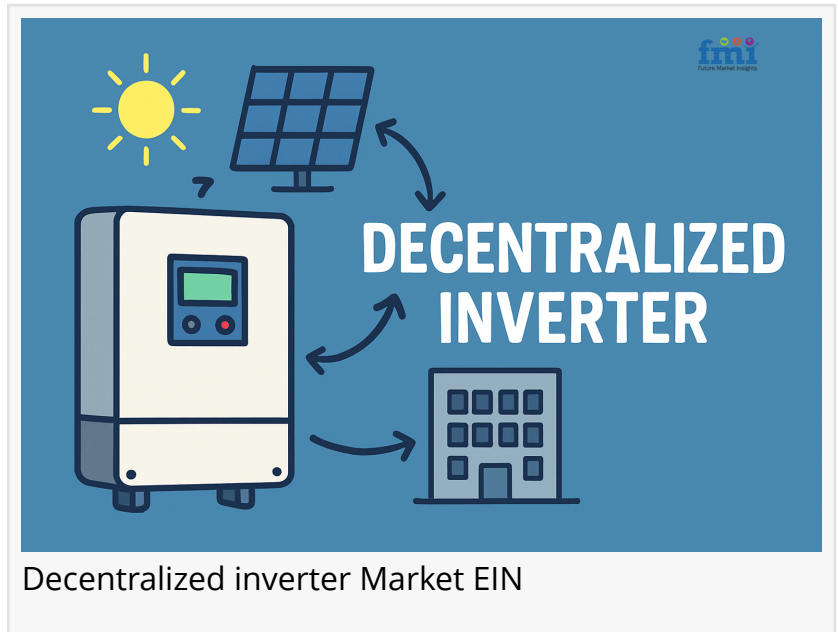
Decentralized inverter are gaining traction in renewable energy systems for their reliability & efficiency driven by innovations like silicon carbide technology

NEWARK, DE, UNITED STATES, April 23, 2025 /EINPresswire.com/ -- The global [decentralized inverter market](#) is experiencing a dramatic upswing, fueled by the global energy transition, rising adoption of solar energy, and cutting-edge advancements in semiconductor technologies. With a projected market valuation of USD 31.9

billion by 2025 and a staggering USD 99.2 billion by 2035, the decentralized inverter sector is expected to grow at a robust CAGR of 12.5% during the forecast period, according to the latest market intelligence.

As the world accelerates its shift towards renewable energy and more resilient power systems, decentralized inverters are emerging as a critical solution across residential, commercial, and industrial applications. These inverters, which convert DC electricity from solar panels into usable AC power at the source, offer several advantages over centralized systems—including enhanced reliability, modularity, and easier fault detection.

Manufacturers are focusing heavily on improving inverter efficiency by leveraging advanced semiconductor materials like silicon carbide (SiC). This material not only boosts power density and switching efficiency but also enhances thermal management, enabling the deployment of decentralized inverters in environments with demanding load conditions.



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Meanwhile, government policies and incentives particularly across North America and Europe



Decentralized inverters, driven by SiC efficiency and policy support, are not just benefiting from solar growth they're powering it, forming a vital pillar of modern decentralized energy systems,"

opines Nikhil Kaitwade, Associate Vice President at FMI

have created fertile ground for decentralized solar solutions. Programs such as the Investment Tax Credit (ITC) in the U.S. and feed-in tariffs across the EU are spurring adoption of rooftop solar with decentralized configurations.

However, despite strong momentum, the industry faces persistent challenges. Global supply chain disruptions, including semiconductor shortages and surging raw material costs, have caused delays in inverter availability and extended timelines for project implementation.

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The comprehensive market report offers:

- Detailed market size projections (2025–2035)
- Competitive landscape profiling of top manufacturers
- Regional market segmentation
- Technological trends analysis
- Supply chain impact assessment
- Key insights on regulatory frameworks
- Strategic recommendations for stakeholders

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Key market drivers include increased demand for solar PV installations, greater grid flexibility requirements, and innovations in semiconductor technology. However, raw material inflation and component shortages remain significant restraints.

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With solar power becoming a mainstream source of electricity, decentralized inverters are increasingly adopted to improve energy resilience and accommodate two-way power flows. Utilities and energy planners are investing in distributed grid infrastructure to enable more flexible and efficient energy systems.

Decentralized inverters also provide valuable support for peak shaving, voltage regulation, and grid stabilization making them an ideal component of next-generation smart grids.

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As climate-related disruptions become more frequent, decentralized energy systems are gaining favor for their reliability and ability to operate independently of central grids. Decentralized inverters play a pivotal role in microgrids and backup power setups, offering critical load support during outages.

This trend is particularly strong in disaster-prone and rural areas, where decentralized solutions help bridge infrastructure gaps and ensure energy access.

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The global shift toward Distributed Energy Resources (DERs) such as residential solar, community wind, and battery storage is significantly driving demand for decentralized inverters. Their scalability and modular nature allow seamless integration of diverse energy sources.

Utilities are also leveraging decentralized inverters in virtual power plants (VPPs) to aggregate and manage energy flows from DERs, improving overall grid efficiency and reliability.

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- Decentralized inverter market to grow at 12.5% CAGR from 2025 to 2035
- Market value projected to reach USD 99.2 billion by 2035
- Adoption bolstered by government incentives in Europe and North America
- Semiconductor innovations (SiC) enhancing power density and efficiency
- Persistent challenges include supply chain constraints and raw material inflation
- Demand driven by DERs, VPPs, and resilient microgrid solutions

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The adoption of silicon carbide (SiC) transistors has revolutionized inverter design. Compared to traditional silicon, SiC allows devices to operate at higher voltages and temperatures, translating into more compact, efficient, and reliable inverter solutions.

These innovations are especially important in industrial and commercial installations, where space and efficiency are critical considerations. Manufacturers are also investing in AI-powered monitoring systems to enable real-time diagnostics and predictive maintenance.

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The boom in residential rooftop solar—particularly in the U.S., Germany, India, and Australia—has created a fertile market for single-phase decentralized inverters. Homeowners prefer these systems for their ease of installation and individual panel optimization.

In the commercial segment, decentralized inverters are preferred for large flat-roof installations, where multiple orientations and panel configurations make centralized designs inefficient.

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- Huawei Technologies Co. – Known for smart inverter systems and AI-based monitoring.
- Sungrow Power Supply Co., Ltd. – Offers wide product ranges with strong global footprint.
- SMA Solar Technology AG – Pioneer in solar inverter solutions, especially for Europe.
- Power Electronics S.L. – Focuses on industrial-grade and utility-scale decentralized systems.
- FIMER S.p.A. – Strong emphasis on residential and commercial inverters post ABB acquisition.
- TMEIC – Offers high-capacity decentralized solutions for industrial use.
- Ginlong Technologies (Solis) – Key player in affordable residential inverter segment.
- Growatt New Energy – Fast-growing manufacturer with presence in over 100 countries.

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Smart grid modernization initiatives are creating new roles for decentralized inverters as grid-interactive components. Features like remote control, reactive power compensation, and frequency regulation are being integrated into next-gen inverter designs.

As utilities digitize their infrastructure, decentralized inverters are expected to become pivotal in managing bidirectional power flows, facilitating dynamic demand response, and enhancing overall grid intelligence.

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- North America: Major growth driven by residential solar, net metering policies, and ITC.
- Latin America: Rising deployment in Brazil, Chile, and Mexico with focus on rural electrification.
- Western Europe: Strong policy support and mature solar market; Germany and the UK lead.
- Eastern Europe: Emerging markets with potential for commercial and industrial adoption.
- East Asia: China dominates manufacturing; Japan and South Korea see residential uptake.
- South Asia & Pacific: India and Australia experience high growth in decentralized solar.
- Middle East & Africa: Off-grid and microgrid projects drive decentralized inverter deployment.

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The industry is bifurcated into string, micro.

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The landscape is bifurcated into single phase, three phase.

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The industry is bifurcated into standalone, on-grid.

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The market is segmented into $\leq 0.5\text{KW}$, $0.5-3 \text{ KW}$, $3-33\text{KW}$, $33-110\text{KW}$, $>110\text{KW}$.

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The industry is categorized into residential, commercial & industrial, utilities.

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The industry is studied across North America, Latin America, Western Europe, Eastern Europe, Central Asia, Russia & Belarus, Balkan & Baltics, East Asia, South Asia & Pacific, The Middle East & Africa.

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The global [Power System Simulator market](#) is expected to reach USD 2,369.4 Million by 2035 from USD 1,438.2 Million in 2025.

The [automated material handling systems market](#) will grow at a yearly rate of 9% from 2025 to 2035. The value of these systems will rise from USD 34,342.9 million in 2025 to USD 81,302.2 million by 2035.

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