

Industry Analysis Report 2026 on Edge Artificial Intelligence (AI) in Smart Grids: Major Trends, Drivers, and Forecasts

The Business Research Company's Edge Artificial Intelligence (AI) In Smart Grids Market Report 2026 – Market Size, Trends, And Global Forecast 2026-2035

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/EINPresswire.com/ -- "The

incorporation of edge artificial

intelligence (AI) within smart grids is transforming how energy systems operate, boosting efficiency and reliability. This technology's adoption is accelerating rapidly as utilities look to enhance grid performance and manage increasing energy demands more effectively. Let's explore the market's current scale, growth drivers, regional highlights, and future outlook in this evolving sector.

Strong Growth Forecast for the [Edge Artificial Intelligence in Smart Grids Market](#)

The market for edge AI in smart grids has witnessed remarkable expansion over recent years. It is projected to rise from \$15.49 billion in 2025 to \$19.46 billion in 2026, representing a compound annual growth rate (CAGR) of 25.7%. This surge can be linked to several factors including the increasing frequency of grid failures and outages, heightened demand for energy efficiency, the growing integration of renewable energy sources, broader deployment of smart meters, and expanded use of industrial Internet of Things (IoT) technologies within utility operations.

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Future Expansion and Emerging Opportunities in Edge AI for Smart Grids

Looking ahead, the edge AI in smart grids market is expected to continue its upward trajectory, reaching \$48.91 billion by 2030 with a CAGR of 25.9%. Anticipated drivers during the forecast period include the adoption of edge AI for predictive analytics, widespread implementation of intelligent relays and processing units, growth in AI-powered grid management solutions,



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increased investments in cybersecurity protections for smart grid infrastructure, and the development of distributed energy resource management systems. Key trends shaping the industry will involve AI-driven grid optimization, real-time forecasting of energy loads, predictive maintenance and asset tracking, integration of smart sensors with edge devices, and improved energy management for greater operational efficiency.

Understanding Edge AI's Role in Smart Grid Systems

Edge artificial intelligence in smart grids encompasses coordinated efforts to enhance energy management and grid intelligence by applying AI algorithms directly at the network's edge. This approach integrates edge computing devices, machine learning models, and real-time data analytics to help utilities and industrial operators monitor, control, and optimize grid performance more effectively. These solutions enable faster decision-making, reduce energy losses, and facilitate more sustainable and reliable operation of power systems.

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How Growing Energy Demand is Accelerating Edge AI Adoption in Smart Grids

One of the primary factors driving market growth is the rising global energy demand. This demand reflects the total energy consumption required by households, industries, and services to power devices and carry out daily operations. With population growth increasing the need for electricity, heating, transportation, and other energy-intensive services, the pressure on energy systems is intensifying. By processing data locally and in real time, edge AI enhances energy management capabilities, allowing more efficient integration of renewable resources and faster response to grid conditions. For example, in September 2025, the International Energy Agency reported that net electricity generation across OECD countries reached 922.6 terawatt-hours in June, marking a 1.4% rise compared to the same period in 2024. This growing demand underpins the expanding use of edge AI technologies within smart grids.

Regional Dynamics in the Edge AI Smart Grids Market

In terms of geographic presence, North America held the largest share of the edge AI in smart grids market in 2025. However, the Asia-Pacific region is expected to experience the fastest growth over the coming years. The market analysis encompasses various key regions, including Asia-Pacific, South East Asia, Western Europe, Eastern Europe, North America, South America, the Middle East, and Africa, providing a broad understanding of regional market trends and opportunities.

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