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Artificial Intelligence in Energy Market by Application (Energy Demand Forecasting, Grid optimization & management, Energy Storage Optimization), End Use (Generation, Transmission, Distribution, Consumption) - Global Forecast to 2030

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Abstracts

The AI in energy market is estimated at USD 8.91 billion in 2024 to USD 58.66 billion by 2030, at a Compound Annual Growth Rate (CAGR) of 36.9%. AI-based methods and ML techniques are expected to help buildings run more efficiently and provide greater comfort levels to occupants. Buildings and HVAC systems have been designed, constructed, and commissioned as fixed systems and with static environmental assumptions. This can lead to inefficiencies because building use, occupancy, and environmental factors change over time. AI can be applied to parse data collected by building systems and integrate with controls to continuously adjust setpoints to optimize HVAC performance while maintaining or improving occupant comfort. AI-based methods can provide additional. Controls to the operators, enabling increased load flexibility of buildings for participation in Virtual Power Plants (VPPs).

'By energy type, conventional energy segment to hold the largest market size during the forecast period."

Artificial intelligence is increasingly being integrated into the more traditional energy sectors such as coal, oil, natural gas, and nuclear energy to make it much more efficient, safe, and sustainable. In fossil fuel-based energy generation, AI optimizes resource extraction, improves plant performance, and enables predictive maintenance that reduces downtime and operational costs. Using coal, oil, and natural gas, AI systems can forecast demand fluctuations, adjust supply levels, and monitor emissions, helping operators comply with environmental regulations. With nuclear energy, AI

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ensures safety by monitoring reactor conditions and predicting anomalies while automating response mechanisms, hence increasing the overall plant reliability. In addition, AI use supports the development of better extracting processes and fewer operational risks in other conventional energy sources, such as peat, oil shale, and tar sands, toward sustainability in energy production. In doing so, AI is redefining the conventional energy landscape, ensuring it is more efficient, safe, and environmentally friendly.

“The services segment to register the fastest growth rate during the forecast period.”

In the AI-driven energy sector, services such as training, consulting, deploying, integrating systems, supporting, and maintenance are critical for operation optimization in generation, distribution, and consumption across an entire power system. Professional services aid energy companies in identifying specific needs using AI solutions, with potential expertise in grid optimization, energy forecasting, and smart grid management. Deployment and integration services guarantee the smooth integration of AI systems with existing energy infrastructures. Support and maintenance ensure that the AI-powered solutions stay up and running with swift troubleshooting and updates, ensuring maximum uptime. Managed services allow energy companies to step back from AI solutions, as external providers handle them to improve efficiency and minimize operational costs. Together, these services empower energy organizations to use AI technologies holistically to drive operational excellence and innovation across the value chain.

“Asia Pacific to hold the highest market growth rate during the forecast period.”

In October 2023, BluWave-ai expanded its business in the Japanese market using AI-driven energy optimization technology. BluWave-ai introduced its technology from global AI deployments to enable the energy transition in Japan by optimizing energy at industrial grid-attached plants with solar generation and battery storage. It partnered with Japanese engineering companies and completed a project at an industrial R&D center. The work included optimization of rooftop solar, battery storage, and biomass generation systems. The Smart Grid Optimizer did some incredible feats such as 20% peak demand reduction, 100% utilization of renewable energy without reverse power flow and significant savings in energy costs. By November 2024, ZTE Corporation and China Mobile developed an AI-driven Green Telco Cloud that dynamically adjusts computing resources using load-based network adjustments toward making energy use in telecommunications networks optimal. In China in November 2024, ZTE Corporation and China Mobile developed an AI-driven Green Telco Cloud that makes energy use in

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telecommunications networks optimal with load-based network adjustments dynamically adjusting computing resources.

In-depth interviews have been conducted with chief executive officers (CEOs), Directors, and other executives from various key organizations operating in the AI in energy market.

By Company Type: Tier 1 – 40%, Tier 2 – 35%, and Tier 3 – 25%

By Designation: Directors –25%, Managers – 35%, and Others – 40%

By Region: North America – 37%, Europe – 42%, Asia Pacific – 21

The major players in the AI in energy market include Schneider Electric SE (France), GE Vernova (US), ABB Ltd (Switzerland), Honeywell International (US), Siemens AG (Germany), AWS (US), IBM (US), Microsoft (US), Oracle (US), Vestas Wind Systems A/S (Denmark), Atos zData (US), C3.ai (US), Tesla (US), Alpiq (Switzerland), Enel group (Italy), Origami Energy (UK), Innowatts (US), Irasus technologies (India), Grid4C (US), Uplight (US), GridBeyond (Ireland), eSmart Systems (Norway), Ndustrial (US), Datategy (France), Omdena (US). These players have adopted various growth strategies, such as partnerships, agreements and collaborations, new product launches, enhancements, and acquisitions to expand their AI in energy market footprint.

Research Coverage

The market study covers the AI in energy market size across different segments. It aims at estimating the market size and the growth potential across various segments, including by offering (solutions and services (professional services, managed services) by energy type (conventional energy (fossil fuels, nuclear energy, other conventional energy types) renewable energy (solar, wind, hydropower, biomass, other renewable energy types) by type (Generative AI, other AI), by application (energy demand forecasting, grid optimization & management, energy storage optimization , renewables integration , energy trading & market forecasting, energy sustainability management, disaster resilience and recovery, other applications (energy theft detection and customer management)) by end use (generation, transmission , distribution, consumption(commercial, industrial)) and Region (North America, Europe, Asia Pacific, Middle East & Africa, and Latin America). The study includes an in-depth competitive analysis of the leading market players, their company profiles, key observations related

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to product and business offerings, recent developments, and market strategies.

Key Benefits of Buying the Report

The report will help the market leaders/new entrants with information on the closest approximations of the global AI in energy market's revenue numbers and subsegments. This report will help stakeholders understand the competitive landscape and gain more insights to position their businesses better and plan suitable go-to-market strategies. Moreover, the report will provide insights for stakeholders to understand the market's pulse and provide them with information on key market drivers, restraints, challenges, and opportunities.

The report provides insights on the following pointers:

Analysis of key drivers (energy market volatility and risk management, rising consumer demand for smart energy solutions, AI-Powered robots increasing energy sector worker safety), restraints (data privacy and security, high implementation cost) opportunities (increasing shift towards carbon emission reduction and sustainability, renewable energy integration), and challenges (insufficient real-time energy data limiting the training and deployment of AI models, lack of skilled professionals in AI and energy analytics.) influencing the growth of the AI in energy market.

Product Development/Innovation: Detailed insights on upcoming technologies, research & development activities, and new product & service launches in the AI in energy market.

Market Development: The report provides comprehensive information about lucrative markets and analyses the AI in energy market across various regions.

Market Diversification: Exhaustive information about new products & services, untapped geographies, recent developments, and investments in the AI in energy market.

Competitive Assessment: In-depth assessment of market shares, growth strategies and service offerings of leading include include Schneider Electric SE (France), GE Vernova (US), ABB Ltd (Switzerland), Honeywell International (US), Siemens AG (Germany), AWS (US), IBM (US), Microsoft (US), Oracle (US), Vestas Wind Systems A/S (Denmark), Atos zData (US), C3.ai (US), Tesla (US), Alpiq (Switzerland), Enel group (Italy), Origami Energy (UK), Innowatts (US), Irasus technologies (India), Grid4C (US), Uplight (US), GridBeyond (Ireland), eSmart Systems (Norway), Ndustrial (US), Datategy

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