

# AI in Renewable Energy Market to Reach \$4.82B by 2031, Driven by Smart Grids and Real-Time Energy Management

*The AI in renewable energy market is growing fast, enhancing energy forecasting, storage, and grid reliability worldwide.*

AUSTIN, TX, UNITED STATES, June 9, 2025 /EINPresswire.com/ -- The [AI in Renewable Energy Market](#) reached USD 845 million in 2023 and is projected to grow significantly, reaching USD 4,823.50 million by 2031, at a compound annual growth rate (CAGR) of 24.32% during the forecast period.



The integration of Artificial Intelligence (AI) into the renewable energy landscape is transforming the way energy is generated, monitored, and utilized worldwide. As nations accelerate their shift toward sustainable power sources, AI is becoming an indispensable tool for enhancing operational efficiency, enabling automation, and providing predictive insights across solar, wind, hydro, and bioenergy systems. This convergence of AI and clean energy is fueling rapid evolution and expansion across the sector.

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By 2031, AI in renewable energy will hit \$4.82B, driving smarter grids, 90% accurate forecasting, and up to 20% more economic value from clean power.

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*DataM Intelligence*

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Regional Insights

North America

North America, particularly the United States, leads the global market in terms of AI integration in renewable energy. Strong government initiatives, widespread adoption of smart grid

infrastructure, and a robust ecosystem of AI companies are propelling market expansion. U.S. utilities are deploying AI-driven demand response and asset management systems to improve grid reliability and resilience.

## Europe

Europe follows closely, with countries like Germany, France, and the UK heavily investing in AI to support their aggressive renewable targets under the European Green Deal. Wind and solar farms across the region are increasingly using AI algorithms to improve energy forecasting, which helps reduce dependence on fossil fuels and enhances grid stability.

## Asia-Pacific

The Asia-Pacific region is emerging as a high-growth market, driven by the rapid development of renewable infrastructure in countries such as China, India, Japan, and South Korea. These nations are adopting AI technologies to manage growing energy demands, optimize solar panel performance, and enhance energy storage systems.

## Leading Companies

ABB

Alpiq

Amazon Web Services, Inc.

Atos SE

FlexGen Power Systems, Inc.

General Electric

Informattec Ltd.

N-iX LTD

Schneider Electric

Siemens AG

Market Segmentation:

By Deployment: On-Premises, Cloud-Based.

By Component: Solutions, Services, Meat/Poultry, Other.

By Application: Robotics, Smart Grid Management, Demand Forecasting, Safety Security & Infrastructure, Others.

By End-User: Energy Transmission, Energy Generation, Energy Distribution, Utilities.

By Region: North America, Europe, South America, Asia Pacific, Middle East, and Africa.

## Latest News of USA

The United States continues to push the frontier in using AI to enhance its renewable energy transition. In early 2025, the U.S. Department of Energy (DOE) announced a \$200 million investment in AI-driven energy research, specifically targeting integration challenges of solar and wind power into national grids. The initiative, known as the SmartGrid AI Acceleration Program, aims to develop intelligent energy management systems to help utilities reduce blackouts and energy waste.

At the state level, California has approved new AI-powered energy storage pilot programs to improve grid resilience in the face of increasing wildfires and heatwaves. Tech companies like Tesla and NVIDIA are partnering with local utilities to test real-time load balancing powered by AI.

In commercial news, Google revealed that its wind farms in Texas now use an AI model to predict power output 36 hours in advance, increasing the economic value of the energy sold by nearly 20%. This predictive capability is enabling better integration with wholesale energy markets, making clean energy more viable.

## Latest News of Japan

Japan is making strategic strides in deploying AI for renewable energy optimization, aligning with its target to achieve carbon neutrality by 2050. In 2025, Japan's Ministry of Economy, Trade, and Industry (METI) launched the AI-Energy Fusion Initiative, a government-backed effort to integrate AI across solar and offshore wind farms. The project is expected to streamline power forecasting and enhance the stability of local microgrids in remote areas.

Japanese companies like Mitsubishi Electric and Hitachi Energy are innovating with AI-powered grid controllers and digital twins for wind farm performance. Mitsubishi recently announced a partnership with the University of Tokyo to develop a neural network model that can simulate 10,000 different weather scenarios and predict renewable output with over 90% accuracy.

Furthermore, Japan's Kyocera Corporation is deploying AI-based maintenance systems for its large-scale solar installations. These systems detect panel defects and performance losses in real-time, reducing downtime and maximizing energy yield.

The country is also exploring AI-enhanced virtual power plants (VPPs), aiming to balance supply-demand dynamics in regions prone to natural disasters. This strategic focus positions Japan as a leader in intelligent clean energy deployment in the Asia-Pacific region.

## Conclusion

The convergence of AI and renewable energy marks a pivotal chapter in the global clean energy transition. As nations race to meet climate goals, AI is proving to be the brain behind the sustainable energy revolution driving smarter grids, predictive maintenance, and efficient energy dispatch.

With strong growth forecasts and dynamic innovations across regions like the U.S. and Japan, the AI in renewable energy market is poised to become a cornerstone of the future energy landscape. Organizations that embrace this intelligent transformation will be better equipped to navigate the challenges and opportunities of a greener world.

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