

Banpu Develops AI to Strengthen Energy Trading in Japan through Data-Driven Analytics and Risk Management

Banpu Public Company Limited, a leading versatile energy company, is advancing its energy trading capabilities in the Japanese electricity market under Banpu Power Trading G.K. by applying AI technology to support electricity trading decisions. Banpu has developed an AI model that integrates the knowledge and experience of its traders with market data analysis and energy price trends to assess trading opportunities, optimize trading volumes, and manage risks, while also enhancing energy trading knowledge and expertise across Power+ business pillar.

Previously, energy trading relied heavily on trader experience, utilizing core principles, past experiences, and decision-making criteria tailored to specific situations. Banpu has codified this knowledge into a testable and verifiable system, which was then extended and developed into an AI model. The AI assists in analyzing the volume of energy to purchase and the optimal timing for selling electricity to the market and assessing the uncertainty of trading signals*, while human traders still oversee the process and make the final decisions.

Beyond "Buy or Sell"

The electricity market is highly volatile due to various factors, including supply, demand, weather conditions, and energy costs, making timely and accurate data crucial for electricity trading decisions. Thus, two AI models were developed to analyze market signals and manage risks. **The first model** analyzes data to assess energy price trends and identify trading opportunities, while evaluating the confidence level of each signal. If a signal remains unclear, the system can reduce the trading volume or opt not to execute trades to control risks. Meanwhile, **the second model** assesses the overall market conditions, enabling the selection of strategies and trading volumes that align with the current market situation.

Both AI models underwent simulated electricity trading tests between January and March 2026, using historical data from the Japanese electricity market. The models generated better results than traditional trading methods due to a superior balance between returns and risk management.

From Simulation to Human-AI Collaboration

Banpu has applied the AI Model in conjunction with its traders in the Japanese energy market, accounting for over 90% of the Company's total electricity trading volume across six regions. Furthermore, the model is actively used as a 'smart assistant' to support traders' daily work. Employees still verify AI recommendations and act as the final decision-makers before executing actual trades. This approach enhances decision-making efficiency and strengthens Banpu's energy trading expertise, fostering seamless collaboration between human potential and AI.

Mr. Niti Pitakteeratham, Country Head – Japan, Banpu Public Company Limited, stated: "Integrating the AI model into electricity trading does not mean technology will replace humans; rather, it utilizes AI to augment the capabilities of our traders. This is especially true for analyzing massive amounts of data and assessing highly complex situations, making work more convenient and efficient. At the same time, our traders have been involved from the development phase all the way to testing the model in real operations. This enables concurrent learning and development between humans and technology, serving as a vital foundation for elevating the potential of our energy trading business and driving the long-term growth of our Power+ business pillar."

Additionally, Banpu is exploring the feasibility of extending the AI model to electricity trading markets in other countries, as well as to other business pillars. This aims to bolster the competitive advantage of both the organization and its personnel, supporting the long-term growth of the energy business.

**Trading signals: The result of market data analysis indicates the direction of the price difference between the Day-Ahead market (electricity trading for next-day delivery) and the Imbalance price (the price used to calculate the difference when pre-traded electricity volumes do not match actual usage). This helps the system evaluate trading opportunities at any given time. The AI model does not merely consider whether to buy or sell but also evaluates the clarity and confidence of that signal.*

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About Banpu

Banpu Public Company Limited is a leading versatile energy company, operating across four business pillars under its Energy Symphonics Strategy: U.S. Closed-Loop Gas, Next-Gen Mining, Power+, and Future Tech – with operations across Asia Pacific and the United States. Banpu is committed to expanding the world's energy capacity through reliable and responsible energy solutions that move the world toward a better future. For more information, visit www.banpu.com.

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