March 26, 2026

Designing a Medium- to Long-Term Trading Market to Secure Quantitative Energy Supply Capacity (kWh) in Japan

～The Role of the Forward Market as a Trading Platform～

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In recent years, against the backdrop of tightening supply–demand conditions and the withdrawal of retail companies, institutional design has been advancing to impose obligations on retail electricity providers to secure quantitative energy supply capacity (kWh) over the medium to long term. In this context, the need for a market that facilitates stable procurement and provides price benchmarks through standardized products has been increasing.

While the existing base-load market is expected to be gradually phased out in the future, the forward market is considered to be broadly consistent with the requirements of a medium- to long-term trading market in terms of product design and transaction mechanisms. On the other hand, due to its relationship with spot market prices and potential competition with futures markets, there are concerns that generation companies may not be able to fully recover their fixed costs. Addressing institutional challenges—such as reducing margin requirements—is therefore regarded as an important issue.

This paper examines the possibility of positioning the forward market as a medium- to long-term trading platform that can support the obligation to secure quantitative energy supply capacity over the medium to long term.

1. Background to the Consideration of a Medium- to Long-Term Trading Market for Securing Quantitative Energy Supply Capacity (kWh)

In the Working Group on Institutional Design Based on the Review of Electricity System Reform, discussions have been advancing toward imposing on retail companies the responsibility to secure quantitative energy supply capacity (kWh) over the medium to long term. This direction has been shaped by experiences such as the tightening of electricity supply–demand conditions and price spikes in 2020–2021, as well as the successive withdrawal of retail companies. In these discussions, not only are specific obligation levels for securing quantitative energy supply capacity (e.g., 50% in FY N-3 and 70% in FY N-1) being considered, but also the appropriate framework for electricity trading to ensure the effective fulfillment of such obligations is being examined.[1]

Means of medium- to long-term electricity transactions can be broadly classified into two categories: (1) transactions of standardized products on power exchanges (PXs), and (2) bilateral transactions between market participants. From the perspective of promoting medium- to long-term electricity trading that contributes to the formation of widely referable, appropriate, and stable electricity price indicators, it is important to develop an environment in which standardized products can be traded on power exchanges. At the same time, bilateral transactions are expected to continue to play an important role as a means for market participants to engage in diverse and flexible arrangements based on their own initiatives.

Based on these considerations, a concept is being explored to establish a medium- to long-term trading market that is accessible to a wide range of participants as an alternative to bilateral contracts. A market that enables participants to secure future electricity volumes (kWh) through standardized products—without being significantly affected by differences in bargaining power or individual creditworthiness—could serve as an important infrastructure, particularly for small- and medium-sized retail companies, in fulfilling their obligations to secure quantitative energy supply capacity.

2. Overview of Markets Handling Electricity (kWh) Other Than the Spot Market

At present, the markets that enable medium- to long-term transactions of physical electricity products include the forward market and the base-load market. The forward market was introduced at the time of the establishment of the Japan Electric Power Exchange (JEPX) in 2005, together with the day-ahead spot market, as a mechanism for hedging price fluctuation risks. The report of the Electricity Industry Subcommittee titled “The Desired Framework for the Future Electricity Business System” (February 2003) pointed out that, as the scope of retail liberalization expands, further development of risk management tools for generation resource investment by market participants would become necessary. It further noted that, in order to support investment decision-making through the formation of reference price indicators and to enhance mechanisms for electricity sales and procurement in times of supply–demand mismatch, it would be appropriate to activate exchange-based trading that strengthens risk management functions, including the introduction of both a forward market and a day-ahead spot market. [2]

In contrast, the base-load market was introduced in 2019 with the objective of enabling new retail entrants to access low-cost base-load generation resources—such as coal-fired power, large-scale hydropower, and nuclear power—that had historically been largely owned or procured under long-term

[1] Agency for Natural Resources and Energy. (2025). Summary of the Working Group on Institutional Design Based on the Review of the Electricity System Reform (Material 4-1). Retrieved February 1, 2026, from https://www.meti.go.jp/shingikai/enecho/denryoku_gas/jisedai_kiban/pdf/004_04_01.pdf

[2] Ministry of Economy, Trade and Industry. (2003). On the Future Desirable Framework of the Electricity Industry System (Report). Retrieved January 20, 2026, from https://www.enecho.meti.go.jp/category/electricity_and_gas/electric/summary/pdf/tousin.pdf

contracts by incumbent utilities. The Interim Report of the Policy Subcommittee for the Full Implementation of Electricity System Reform (February 2017) highlighted that access to such low-cost base-load generation resources had been limited for new retail entrants, constituting a barrier to further competition.[3] Against this background, the base-load market was established as a new mechanism to facilitate access to base-load generation resources for new retail entrants, thereby ensuring a level playing field between incumbent utilities and new retail entrants.

On the other hand, in July 2020, incumbent utilities and JERA announced their commitment to non-discriminatory wholesale supply—both internally and externally—with the aim of preventing undue cross-subsidization and ensuring equal access to generation resources. Following this commitment, wholesale auctions have been implemented by each utility. Looking ahead, as non-discriminatory wholesale practices become further entrenched, it is conceivable that the role of the base-load market will gradually diminish.

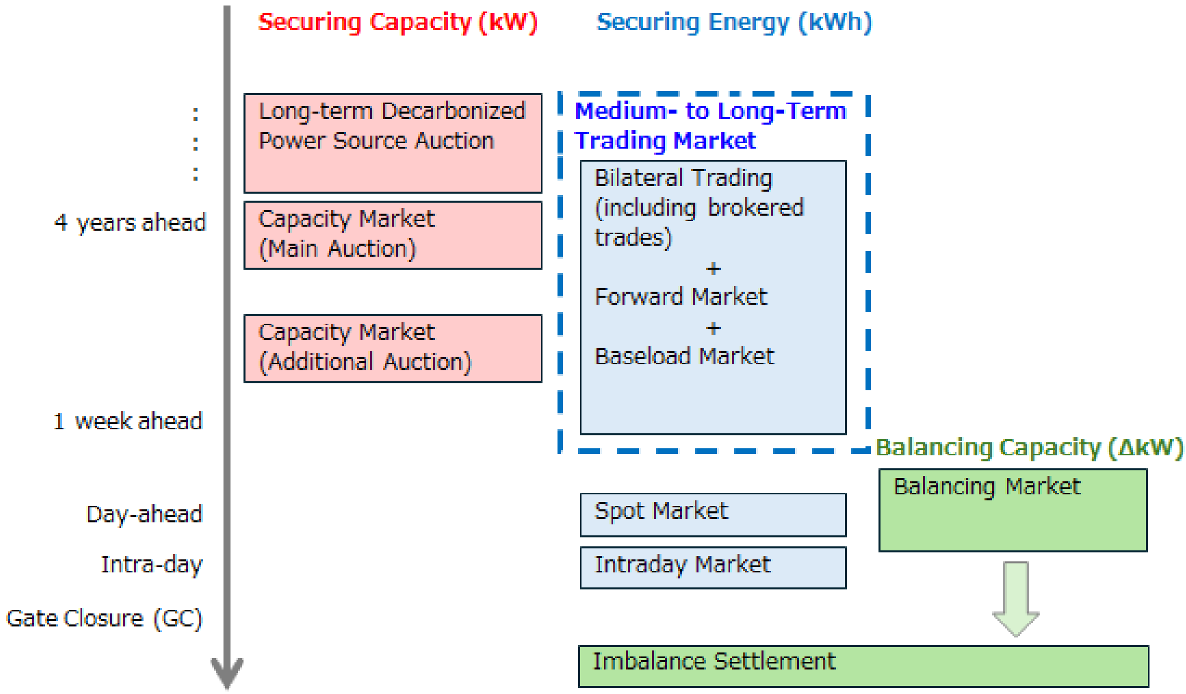

Figure 1: Medium- to Long-Term Electricity (kWh) Trading Markets
Source: Prepared by The Institute of Energy Economics, Japan, based on materials from the Agency for Natural Resources and Energy.

[3] Ministry of Economy, Trade and Industry. (2017). The Interim Report of the Policy Subcommittee for the Full Implementation of Electricity System Reform. Retrieved January 20, 2026, from https://www.meti.go.jp/shingikai/enecho/kihon_seisaku/denryoku_kaikaku/pdf/20170209002_01.pdf

Table 1. Comparison of the Base Load Market and the Forward Market in Japan

Item	Base Load Market	Forward Market
Characteristics	Introduced to facilitate access by new entrants to baseload generation resources (coal-fired power, large-scale hydropower, nuclear power, geothermal). Incumbent utilities are institutionally required to supply electricity from baseload sources, enabling new entrants to purchase it at a fixed annual price.	Depending on the product, trading is possible from three years prior to delivery (annual products) to three days prior (weekly products). Retail companies can procure required supply capacity at fixed prices over the medium to long term.
Year Introduced	July 2019	April 2009 (Standardized forward trading has been conducted since April 2005)
Market Operator	Japan Electric Power Exchange (JEPX)	Japan Electric Power Exchange (JEPX)
Main Market Participants	Sell orders: Former General Electricity Utilities, Electric Power Development Co., Ltd. (J-Power) (no restriction on sell orders by new entrants)	Sell orders: Generation companies
	Buy orders: New entrants (no restriction on bids outside their service areas)	Buy orders: Retail companies
Trading Products	Products with delivery periods of 1 year or 2 years (delivery begins in April of the year following the auction)	Annual products (1-year delivery), monthly products (1-month), and weekly products (1-week). (Annual products are 24-hour only; monthly and weekly products include both 24-hour and daytime products [weekdays 8:00–18:00])
Trading Method	Single-price auction (held four times in the year prior to delivery: August, October, November, and January)	Continuous trading (order-driven market) (held every business day)
Delivery Method	Settled through the spot market	Settled through the spot market
Market Coverage	Three markets: Eastern Japan, Western Japan, and Kyushu	Two markets: Eastern Japan and Western Japan
Trading Unit	100 kW	1 MW
Transaction Fee	JPY 15,000 per matched order for both buyers and sellers (excluding tax)	JPY 10,000 per matched annual contract; JPY 1,000 per matched monthly or weekly contract (excluding tax)
Margin Requirement	For 1-year delivery products: 1% of the value of undelivered purchased electricity For 2-year delivery products: 2% of the value of undelivered purchased electricity	Total amount of the price differences based on the reference price of forward trading products

Source: Prepared by the Institute of Energy Economics, Japan, based on materials from the Agency for Natural Resources and Energy, among others[4][5].

[4] Agency for Natural Resources and Energy. (2021). Current Status and Challenges of the Baseload Market (Material 5). Retrieved January 20, 2026, from https://www.meti.go.jp/shingikai/enecho/denryoku_gas/denryoku_gas/seido_kento/pdf/048_05_00.pdf

[5] Agency for Natural Resources and Energy. (2025). Current Status and Challenges of the Baseload Market (Material 5). Retrieved January 20, 2026, from https://www.meti.go.jp/shingikai/enecho/denryoku_gas/jisedai_kiban/system_review/pdf/108_05_00.pdf

3. Policy Discussions on the Institutional Design of the Medium- to Long-Term Trading Market

With regard to the medium- to long-term trading market, the report "Review of Electricity System Reform and Future Policy Directions: Toward the Construction of a Sustainable Electricity System that Achieves Both Stable Supply and Decarbonization" (March 2025) positioned such a market as a mechanism that enables stable procurement in terms of both volume and price, thereby initiating detailed discussions.[6] In December 2025, the "Draft Summary of the Working Group on Institutional Design Based on the Review of Electricity System Reform" was presented, in which the medium- to long-term trading market was also addressed as one of several policy measures.[7]

Within these discussions, it was indicated that the base-load market could be functionally replaced by the establishment of a medium- to long-term trading market, and a direction was set to proceed with its gradual phase-out. In this context, if a new medium- to long-term trading market is not introduced, the forward market could be considered as a potential alternative. An examination of the consistency between the requirements discussed for a medium- to long-term trading market and the current design of the forward market suggests that, by clarifying the rules governing the forward market and repositioning it from a voluntary trading platform to a market for securing quantitative energy supply capacity, it would be possible for the forward market to fulfill the role of a medium- to long-term trading market.

The following sections review the consistency between the discussions to date on the medium- to long-term trading market and the current institutional design of the forward market. As a result, it is considered that, by implementing measures such as clarifying the rules of the forward market and positioning it not merely as a venue for voluntary transactions but as a market with an institutional role in securing quantitative energy supply capacity, the forward market can adequately perform the functions required of a medium- to long-term trading market.

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6 Agency for Natural Resources and Energy. (2025). Review of the Electricity System Reform and Future Policy Directions: Toward the Construction of a Sustainable Electricity System that Achieves Both Stable Supply and Decarbonization. Retrieved January 20, 2026, from https://www.meti.go.jp/shingikai/enecho/denryoku_gas/denryoku_gas/pdf/20250331_1.pdf

7 Agency for Natural Resources and Energy. (2025). Draft Summary of the Working Group on Institutional Design Based on the Review of Electricity System Reform. Retrieved January 20, 2026, from https://www.meti.go.jp/shingikai/enecho/denryoku_gas/jisedai_kiban/system_design_wg/pdf/008_03_00.pdf

Table 2: Consistency between the Requirements for a Medium- to Long-Term Trading Market and the Design of the Forward Market

Item	Requirements for the Medium- to Long-Term Trading Market (Based on Policy Discussions)	Institutional Design of the Forward Market
Value and Price Formation	Products traded in the medium- to long-term market correspond to standardized products among those traded in bilateral medium- to long-term contracts, and the value traded should be equivalent to that in bilateral transactions.	○ Standardized products such as annual, monthly, and weekly contracts are traded.
	Prices in the medium- to long-term market should, in principle, be set in a manner similar to bilateral transactions, incorporating both fixed and variable costs of generation resources.	– Not explicitly stated; however, similar to the Base Load Market, it may be possible to incorporate fixed and variable costs into prices after deducting revenues from the capacity market.
	Each generation company sets prices based on its own assessment of fixed and variable costs.	– Not explicitly stated; however, generation companies are likely able to set prices flexibly.
Market Monitoring	Direct price regulation, such as price caps or verification of cost-based pricing formulas, is not considered appropriate.	– Not explicitly stated; however, no mechanism appears to exist for verifying cost-based pricing on an individual basis.
	Conduct that undermines market fairness should be subject to monitoring.	○ Prohibited conduct is monitored.
Measures to Increase Supply Volume	At least for the initial period after market launch, generation companies above a certain scale should be required to offer electricity to the market.	× No requirement to offer electricity; participation is voluntary.
	The threshold for large-scale generation companies is defined as companies whose total maximum generation capacity exceeds 5 GW (corresponding to the former General Electricity Utilities〔except Okinawa Electric Power Company〕 and Electric Power Development Co., Ltd.).	× No requirement to offer electricity.
	In principle, generation companies should offer electricity equivalent to 10% of their sales volume.	× No requirement to offer electricity.
Trading Method (Matching Mechanism)	Continuous trading (order-driven trading) should be considered as the primary trading method.	○ Continuous trading is adopted.
Products Traded	The trading years should be designed to align with the requirement imposed on retail companies to secure energy supply (kWh), initially covering three years and one year prior to physical delivery.	○ Trading is possible from April 1, three years prior to the year in which delivery begins.
	The delivery period should, in principle, be a single year.	○ Annual products have a delivery period of one year.
	Regarding load patterns: (1) products traded three years before delivery should mainly be baseload products, with possible inclusion of mid-load products; (2) products traded one year before delivery should mainly be mid-load products, with possible inclusion of baseload and peak products.	– Annual products are primarily baseload products, but monthly and weekly products include peak-type products; new product designs may be possible.
Delivery	Cross-regional transactions using interconnection lines should be permitted.	○ Delivery occurs through the spot market, allowing cross-regional transactions.
	Transactions using interconnection lines should be settled via the spot market.	○ Delivery is settled through the spot market.

	Market splitting risk should basically be borne by buyers.	○ Settlement is based on spot market prices (Tokyo or Kansai area prices), meaning buyers bear market splitting risk.
Settlement and Clearing	The system should enable participation by small-scale market participants.	× Margin requirements may impose a burden on smaller participants.
Market Operator	The operator should ensure reliability (transparent and fair price indicators), neutrality (neutral market operation for all participants), and stability (a stable trading environment).	○ The market is operated by the Japan Electric Power Exchange (JEPX).
Market Participants	Sellers should be generation companies, and buyers should be retail companies, subject to the requirement to secure energy supply (kWh).	○ Sellers are generation companies, and buyers are retail companies.
Relationship with Other Markets	Adjustments are necessary to avoid the risk of generation companies receiving double recovery of fixed costs.	– Not explicitly stated; however, similar to the Base Load Market, fixed and variable costs may be reflected in prices after deducting revenues from the capacity market.

Source: Prepared by the Institute of Energy Economics, Japan, based on materials from the Agency for Natural Resources and Energy and the Japan Electric Power Exchange (JEPX).

4. Challenges and Considerations in Positioning the Forward Market as a Medium- to Long-Term Trading Market

When positioning the forward market as a medium- to long-term trading market, it is necessary—based on the discussions presented in the “Draft Summary of the Working Group on Institutional Design Based on the Review of Electricity System Reform”— to clarify the mechanism of price formation in the forward market. Specifically, it is envisaged that generation companies would submit sell orders at price levels that reflect, in addition to variable costs, fixed cost components net of revenues recovered through mechanisms such as the capacity market, or at levels that incorporate such fixed cost components while referring to expected spot market prices. In the base-load market, for example, generation companies are required to set upper price limits for offers based on average generation costs of base-load generation resources, net of revenues from the capacity market and other sources. [8][9]

On the other hand, in the spot market, under normal conditions where competition functions effectively and sufficient quantitative energy supply capacity (kWh) exists, prices tend to converge toward the marginal cost of relatively low-cost generation sources. As a result, for retail companies, procurement through the spot market often results in relatively low price levels during normal periods. Such price formation in the spot market exerts a certain converging effect on price levels in the forward market. Consequently, for generation companies seeking to pass through fixed cost components in the forward market, there may be situations in which such costs cannot be fully reflected in prices.

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[8] Agency for Natural Resources and Energy. (2018). Base Load Market (Document 5). Retrieved February 1, 2026, from https://www.meti.go.jp/shingikai/enecho/denryoku_gas/denryoku_gas/seido_kento/pdf/022_05_00.pdf

[9] Agency for Natural Resources and Energy. (2025). Base Load Market Guidelines. Retrieved February 1, 2026, from https://www.enecho.meti.go.jp/category/electricity_and_gas/electric/summary/regulations/pdf/blgl_20250806.pdf

At the same time, if a system is introduced that obliges retail companies to secure quantitative energy supply capacity (kWh)—for example, requiring them to secure 70% of their projected sales volume one year in advance—retail companies would need to procure the corresponding volume in advance through the forward market or similar mechanisms. Assuming a projected sales volume of 100, retail companies would procure 70 units in the forward market by selecting and executing relatively lower-priced sell orders submitted by generation companies, taking into account trading conditions and price trends under a continuous trading (order-matching) mechanism. These sell orders would typically reflect variable costs (or expected spot prices) together with fixed cost components net of capacity market revenues.

As a result, if generation companies submit sell orders at relatively high price levels, such orders are likely to remain unexecuted once retail companies have fulfilled their supply procurement obligations. For retail companies, after securing the required 70%, it becomes rational to procure the remaining 30% through the spot market or other short-term mechanisms.

Furthermore, if it is assumed that hedging through futures transactions can be counted toward the fulfillment of supply procurement obligations, the futures market would attract not only physical market participants but also financial players. In such a setting, arbitrage trading based on expectations of future spot prices would become active, and futures prices would be formed with a certain degree of linkage to spot market prices. Under this market structure, futures prices are more likely to reflect expected spot prices and risk premiums rather than consistently incorporating fixed cost components net of capacity market revenues. Accordingly, it would be difficult for generation companies to continuously execute sell orders in the futures market at price levels that ensure recovery of such fixed cost components.

In this case, retail companies may have an incentive to fulfill their supply procurement obligations through the futures market—where price levels may be relatively lower—rather than through the forward market, where prices may include fixed cost components. If it becomes institutionally permissible for retail companies to satisfy all or most of their 70% obligation through the futures market, demand for procurement in the forward market would decline significantly. As a result, generation companies may face increased difficulty in securing sales opportunities in the forward market.

In light of these considerations, from the perspective of promoting the forward market, it may be appropriate for the government to implement support measures aimed at alleviating credit and collateral constraints, such as reducing margin or deposit requirements associated with forward market transactions. Such measures could lower barriers to market participation in the forward market—particularly for small- and medium-sized participants who perceive margin requirements in the futures market as relatively burdensome—and thereby expand the scope for utilizing the forward market.

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