

Working Group on Stimulation of Japan's Power Futures (abstract)

**May 2024
Ministry of Economy, Trade and Industry**

1. Current Status of Japan's Power Futures

2. Role of Power Futures

3. Directions of Power Futures

**3-1. Toward Increasing the Liquidity of
the Power Futures Market**

**3-2. Supervision to Ensure Transparent and
Fair Trading**

Movements in Japan Power Futures

- In 2019, TOCOM listed power futures as commodity derivatives, and power futures trading began in Japan.
- We discussed the roles of power futures, issues facing the current power futures market, and the direction of future market design, after integrating the knowledge of a variety of experts.

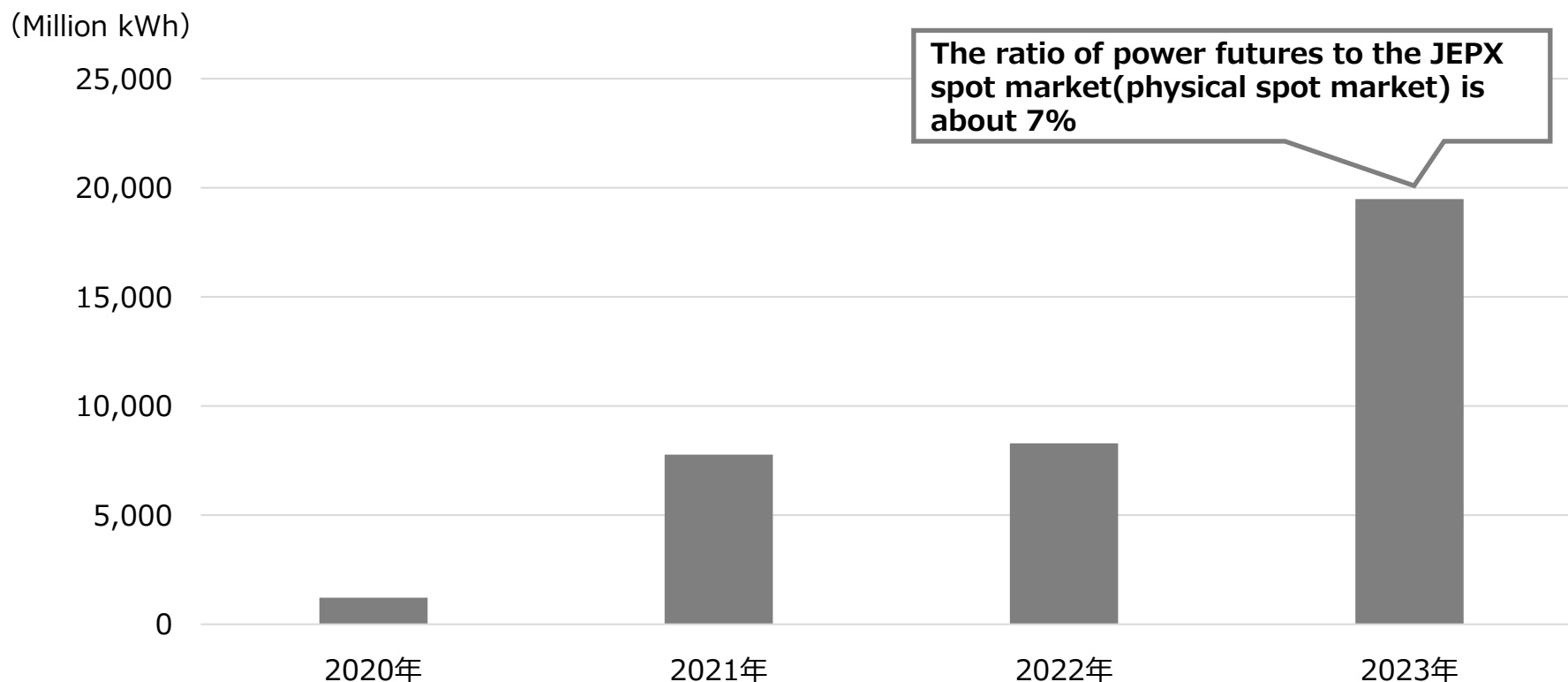
2014	Commodity Derivatives Transaction Act Revised	Added "Electricity" to the commodities in the Act.
2016	Electricity System Reform (Fifth System Reform)	Implementation of full deregulation of electricity retailing.
2018	Working Group on the State of the Electricity Futures Market (電力先物市場の在り方に関する検討会)	In response to the full deregulation of electricity retailing, they recommended that an electricity futures market should be established in Japan.
2019	TOCOM listing "Power Futures" on a trial basis	—
2020	EEX (European Energy Exchange) - Clearing Service for OTC trading of Japanese Electricity Futures Commences	—
2021	Working Group on the Future of the Energy Futures Market (今後のエネルギー先物市場の在り方に関する検討会)	Discussion on issues to ensure a fair trading environment and to revitalize the market for the new integrated energy futures market including electricity futures and LNG futures.
11/2023~ 4/2024	Working Group on Stimulation of Japan Power Futures (電力先物の活性化に向けた検討会)	Discussion on the integration of each player's knowledge on electricity futures, issues facing the market and future directions.

Trading volume of Japan Power Futures

Provisional Translation

- Trading volume of power futures has increased since 2019. The ratio of power futures to the JEPX spot market (physical spot market) is about 7% in 2023 on a trading volume basis.
- **Power futures are becoming a powerful hedging tool for price risk management and a price index for electricity trading in Japan.**

Trends in Trading Volume of Electricity Futures



※ Compiled by METI based on the volume traded on the Japan Electric Power Exchange (JEPX) spot market, TOCOM (Tokyo Commodity Exchange), and EEX (European Energy Exchange). EEX trading volume data is based on data from May 2020, when the clearing service for OTC trading was launched.

Conceptual illustration of risk hedging using power futures

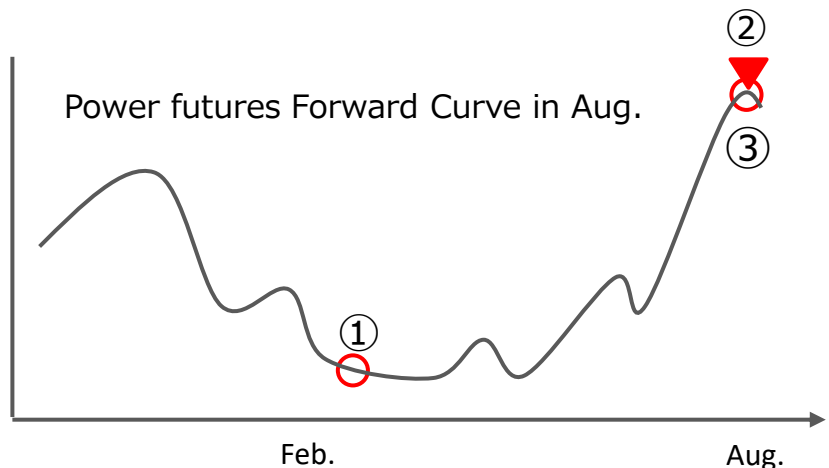
- Electric utilities use a combination of physical and futures options to hedge against price volatilities in the physical electricity market.

“ Hold futures first, then unwind futures as physicals are procured.”

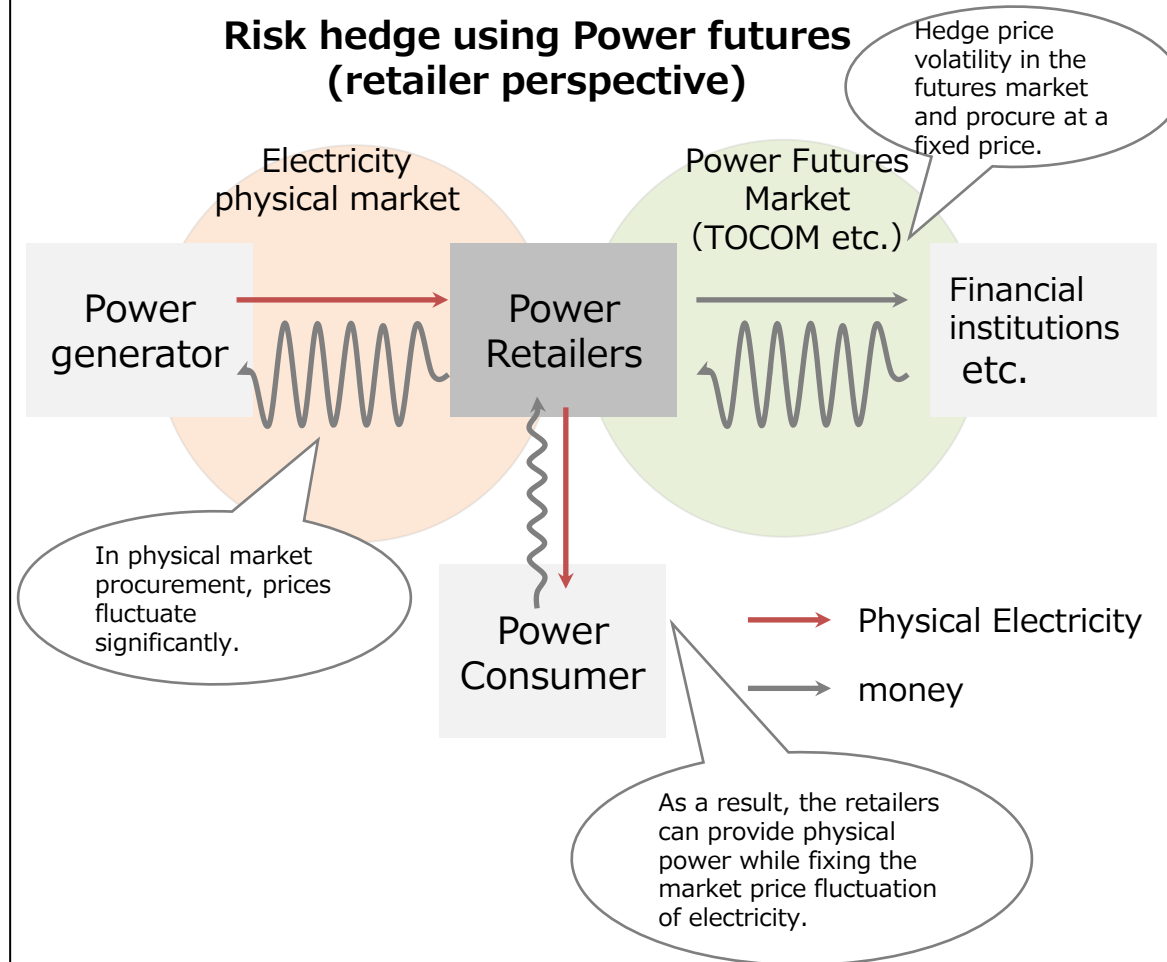
[Case Study]

A retail electric utility's supply and demand plan is finalized in February and they want to hedge the procurement price for August.

- February, they buy futures at 10 yen/kWh for August.
- Suppose that the spot market rises to 15 yen/kWh in August. if they sell the futures contract, they will earn the difference of 5 ($=15-10$) yen/kWh from your futures position.
- At the same time, they buy electricity at 15 yen/kWh in the spot market.
- As a result, it has the same effect as procuring electricity at $15 - 5 = 10$ yen/kWh.



Risk hedge using Power futures (retailer perspective)



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Summary of the Working Group on Stimulation of Japan Power Fut

Provisional Translation

※ The following are only examples.

Environment
al Changes

Electric utility companies
Increased uncertainty in the business

- Activation of the wholesale electricity market
- Expansion of renewable energy
- Tightening of global LNG supply and demand etc.

Risk

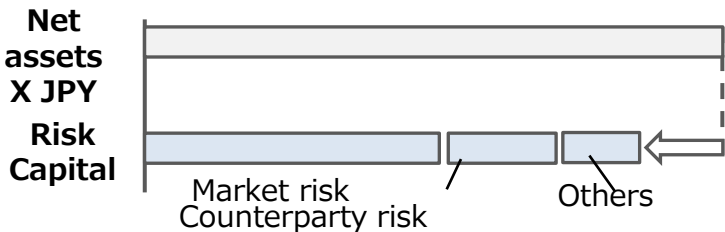
Supply/Demand
Volatility Risk

Electricity/fuel price
volatility risk
(Market risk)

Credit counterparty
risk
(Counterparty risk/Credit risk)

Risk
Manageme
nt

- Risk management policies in internal regulations and manage risks with effective governance.
- Confirm that the amount of risk is within the risk tolerance level.



Need for
power
Futures

Hedge on Electricity market

- price volatility in the wholesale electricity market
- Difference between fuel prices and electricity sales prices

Price discovery

- Price index in yen settlement reflecting domestic supply and demand

Clearing
counterparty risks

- Using Clearing house

Problem
& Solution

- Electricity futures should be supervised under domestic law in an integrated manner with the physical electricity market. There is an urgent need to develop power futures markets under Japan's commercial futures law.
- Electricity futures should **target medium- to long-term** (approximately one year before actual supply) **to short-term hedging needs**.
- The key to expanding liquidity is **(1) designing the futures market based on the physical commodity system and business, and (2) participation in clearing members with reliable financial institutions**.
- Remove obstacles to new entrants and broaden the base of market participation.
- Ensuring **a transparent and fair trading environment** is important. We will continue to work on market supervision as a regulator, with market operators, and trading participants.

The risk of power/fuel price volatility (market risk)

- <Electricity> JEPX's day-ahead market (spot market) is priced every 30 minutes. Market prices fluctuate widely due to the level of fuel prices and the supply-demand balance, which changes depending on the day's weather and other factors.
- <Fuel: LNG> Japan has a high ratio of LNG and coal-fired power generation, so electricity prices are greatly affected by the prices of these fuels.

JEPX spot market

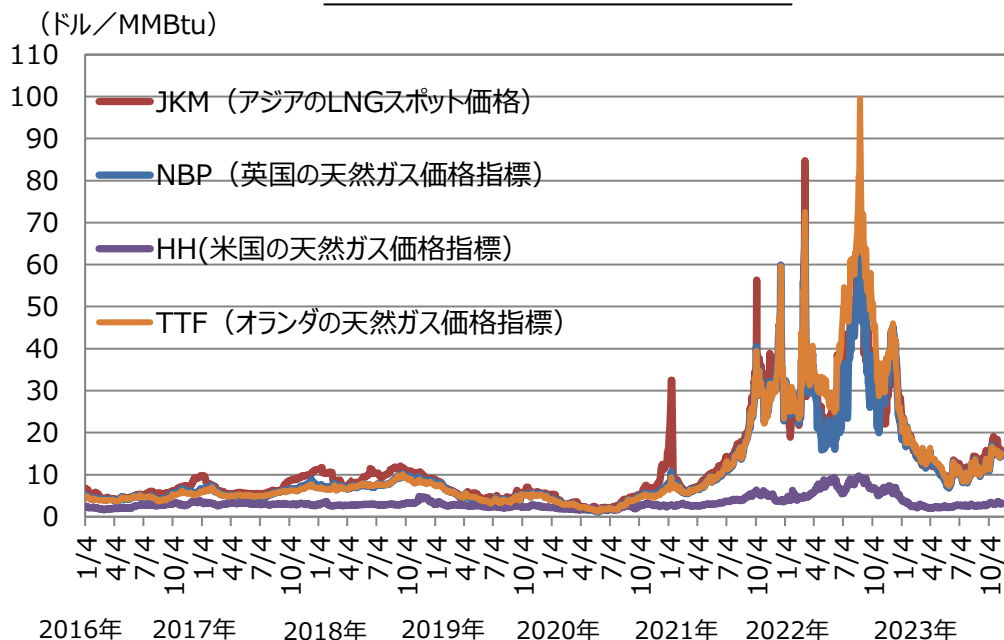
(参考) 2020年度冬期の電力需給ひっ迫と市場価格高騰

- 2020年12月中旬から2021年1月上旬にかけて、断続的な寒波により電力需要が大幅に増加し、LNGの在庫が減少したことで発電が稼働抑制されるとともに、その他発電所の出力低下により供給力が低下したことで、**電力需給がひっ迫する事態が発生**。
- これに伴い、日本卸電力取引所の一日前市場（スポット市場）への売り入札が減少し、**売り切れ状態が継続**した結果、過去に例を見ない水準で**市場価格が高騰**。
- この結果、**電気事業者の経営に大きな影響**を与えたと同時に、スポット市場の価格変動リスクを回避する手段として、**先物市場・先渡市場等を活用したヘッジ取引の重要性を改めて認識**。



9

LNG market



(出典) EIA、ICE、S&P Global Platts

Significance of a domestic electricity futures market

- The electricity futures market has a price formation function. To ensure fairness, the price of electricity futures should be supervised under domestic law in unison with the price of physical electricity, whose production and distribution is limited to the domestic market and essential for people's daily lives.
- In the Japanese commodity futures world, the number of exchanges has decreased with the decline in trading volume, and the market has been rigidly managed.
- There is an urgent need to develop a commodity exchange (electricity futures market) under the Japanese futures law, while maintaining the principle of competition among exchanges, including the emergence of new players in the future.
- ※ Participation of foreign traders and others in the Japan's power futures market under Japanese domestic act is encouraged. It is important to incorporate foreign knowledge.

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Toward Increasing the Liquidity of the Power Futures Market

- Power futures have the advantages of having an Order-book-style screen, allowing the trader to choose the timing of the transaction, a price discovery function, and the ability to clear counterparty risk. Taking full advantage of these benefits, work will begin to stimulate power futures as a tool that contributes to risk management for electric utilities, targeting medium- to long-term (approximately one year before actual demand) to short-term hedging needs.
- The key to expanding liquidity is (1) designing the futures market based on the physical commodity system and business, and (2) participation by reliable financial institutions as clearing members. In addition, removing obstacles to new entrants and broadening base market participation is needed.
- Ensuring a transparent and fair trading environment is important. We will continue to work on market supervision as a regulator, with market operators, and trading participants.

**Increase
Liquidity**

Design futures based on the physical commercial flow & participation by reliable financial institutions as clearing members

- the linkage between the physical and futures markets
- participation by reliable financial institutions as clearing members

**For new
entrants**

Address obstacles for new entrants

- Sharing of best practices in power futures
- Sharing knowledge of accounting
- Develop Human resources

Education

Expansion of the base of market participants

- Education by market operators, etc.

A consensus on the role of power futures

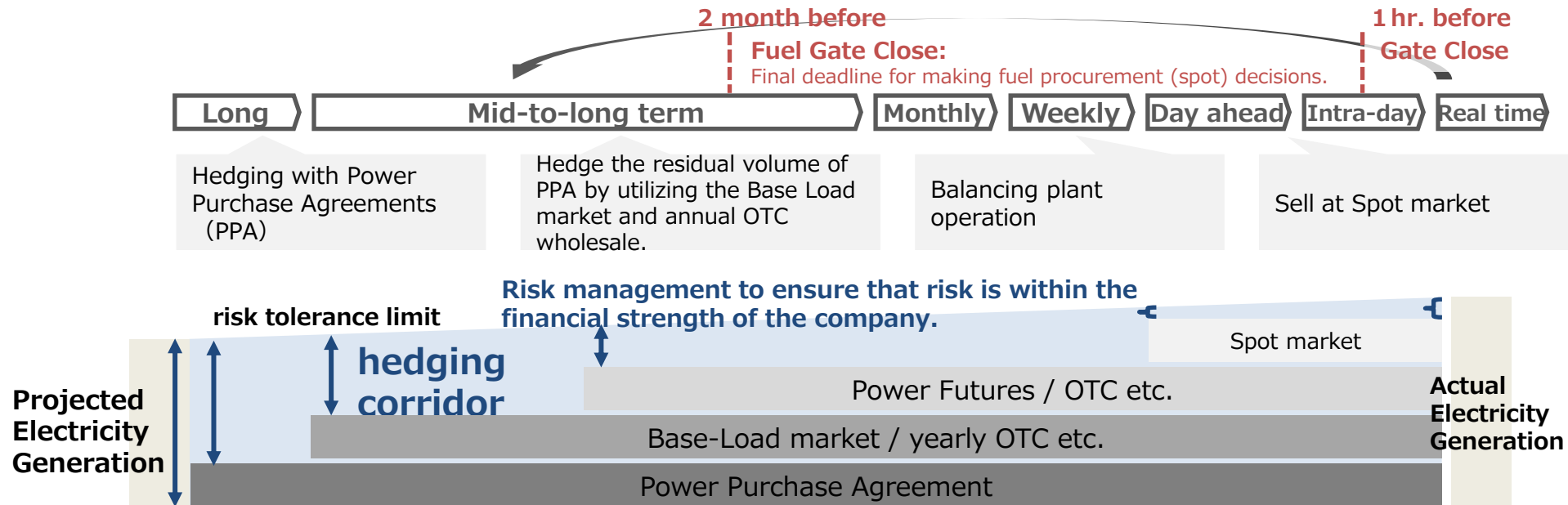
- Power futures should target medium- to long-term (approximately one year before actual supply) to short-term hedging needs.

Hedging activity of Power Generators

Provisional Translation

※ The following are only examples.

- The power generator takes steps to keep the risks within its financial strength.
- Target for power futures market is a hedging tool that maintains liquidity over the long-medium to short term on the screen-trade.



	Long	2 years	1 yaer	half year	3 month	Monthly	Weekly	Day ahead	Intra-day
OTC			* *	*	*	*			
Base-Load market		*	*						
Spot market								* *	
Power Futures						*			

as an exchange transaction, the spot market is highly liquid.

It is important for power futures to maintain liquidity over the medium to short term, bridging between annual and spot trading, and to serve as a hedging tool with the ability to choose the timing of execution.

: cover area

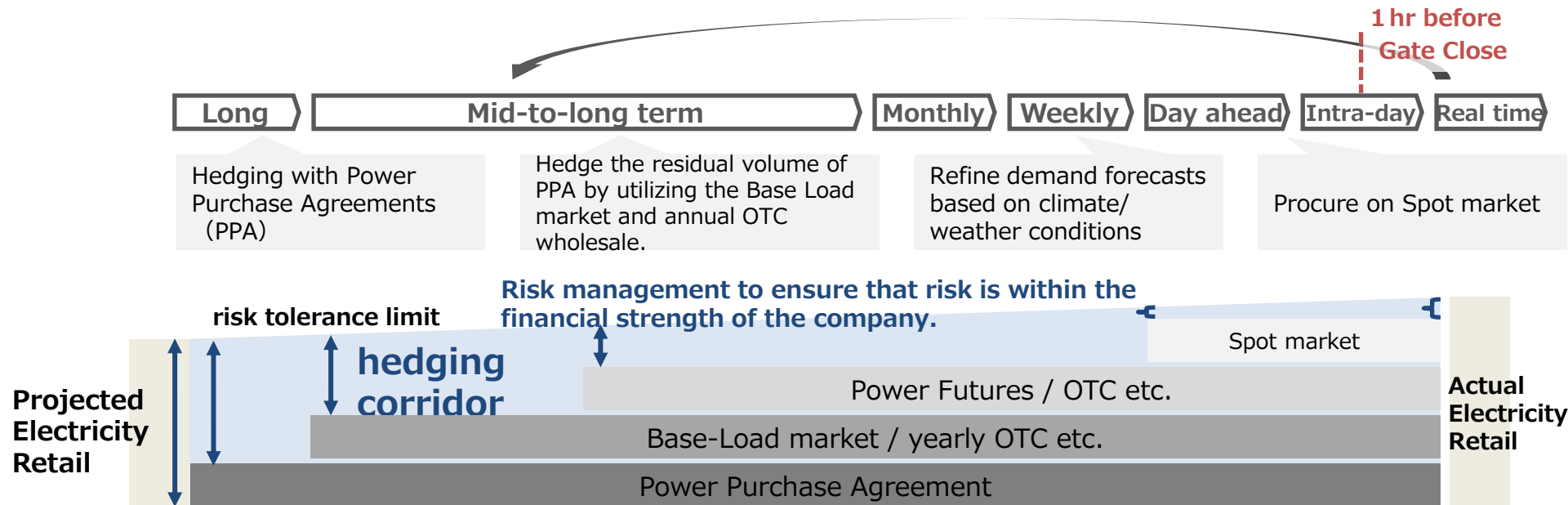
* : High Liquidity area

Hedge activity of Power Retailer

Provisional Translation

※ The following are only examples.

- The retailer takes steps to keep the risks within its financial strength.
- Target for power futures market is a hedging tool that maintains liquidity over the long-medium to short term on the screen-trade.



Comparison btw hedging tools	Long	2 years	1 yaer	half year	3 month	Monthly	Weekly	Day ahead	Intra-day
	OTC		* *	*	*	*			
	Base-Load market	*	*						
	Spot market							* *	
	Power Futures					*			

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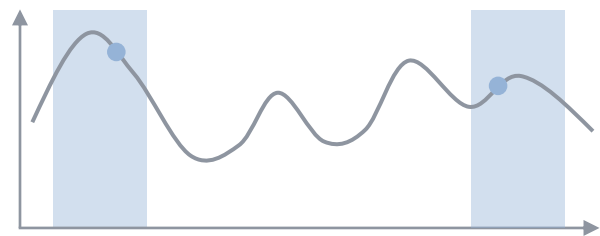
* : High Liquidity area

Significance of increasing market liquidity during the term

- Since it is difficult to predict future market conditions, instead of completing all hedging transactions in one shot, it is necessary to diversify the timing of transactions and ensure an environment in which transactions can be made when market conditions are favorable.

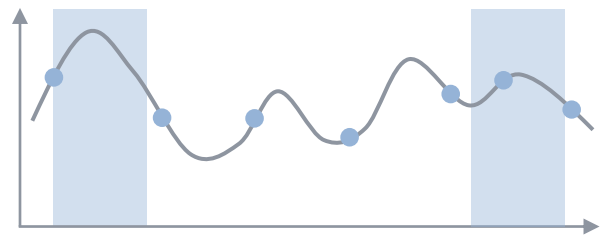
Difference in hedging frequency

In case of collective hedging



Although earnings are fixed, there is a risk of losing a lot of money.

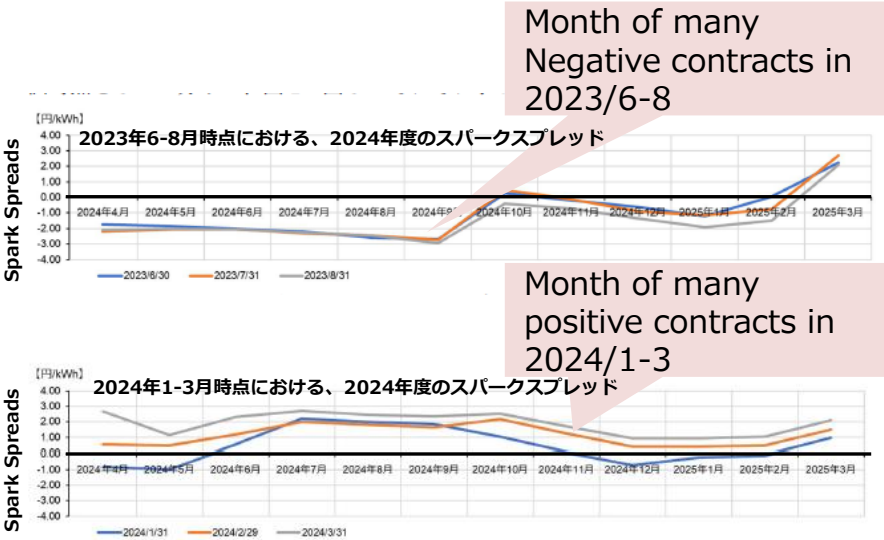
In case of hedging several times a year



— : market condition ● : Transaction

Changes in Spark Spreads

Spark Spreads : An indicator of the economics of gas-fired power plants, calculated as the difference between the price of electricity per kWh and the price of the natural gas required to generate it.



※Spark spreads are illustrated with each month of FY2024 as the contract month, prepared by the Central Research Institute of Electric Power Industry using EEX electricity futures prices for East Area baseload commodities and NYMEX LNG JKM (Platts) futures. Thermal efficiency of generating units is assumed to be 50%.

Linkage of electricity futures trading with physical trading

- Electric utilities hedge using a combination of physical and futures. The system and products of the futures market should be designed based on the physical system and commercial distribution.
- Although there are some issues that need to be addressed in terms of operation and legal system, it can be evaluated that the general direction of the scheme is based on the above-mentioned policy.
- As a side effect of this scheme, the committee also heard the opinion that the linking of physical and futures markets may remove one of the hurdles to the application of hedge accounting, namely, the issue of evaluating the effectiveness of hedging instruments.

JEPXスポット取引とTOCOM先物取引の連携サービス（JJ-Link）

- JEPXとTOCOMは、国内法に基づく取引所間の協力により、**現物・先物の取引間の連携サービスを共同で提供**予定。
- TOCOMの先物ポジションに相当する現物をJEPXのスポット取引で調達するサービス（「**JJ-Link**」（仮称））を**2段階で開始**する想定。

※JEPX会員のうち、約100社がTOCOM市場に口座を開設済み。

<サービスのイメージ>

現行	フェーズ 1 サービス開始	フェーズ 2 ワンストップ・サービス化
<div><div>電力会社</div><div>先物発注</div><div>電力会社</div><div>現物発注</div><div>TOCOM</div><div>先物</div><div>JEPX</div><div>現物</div></div>	<div><div>電力会社</div><div>先物発注</div><div>電力会社</div><div>現物発注</div><div>TOCOM</div><div>先物</div><div>JEPX</div><div>現物</div><div>連携</div><div>2024年秋頃</div></div>	<div><div>電力会社</div><div>先物発注</div><div>電力会社</div><div>現物発注</div><div>TOCOM</div><div>先物</div><div>JEPX</div><div>現物</div><div>連携</div><div>2025年以降</div></div>

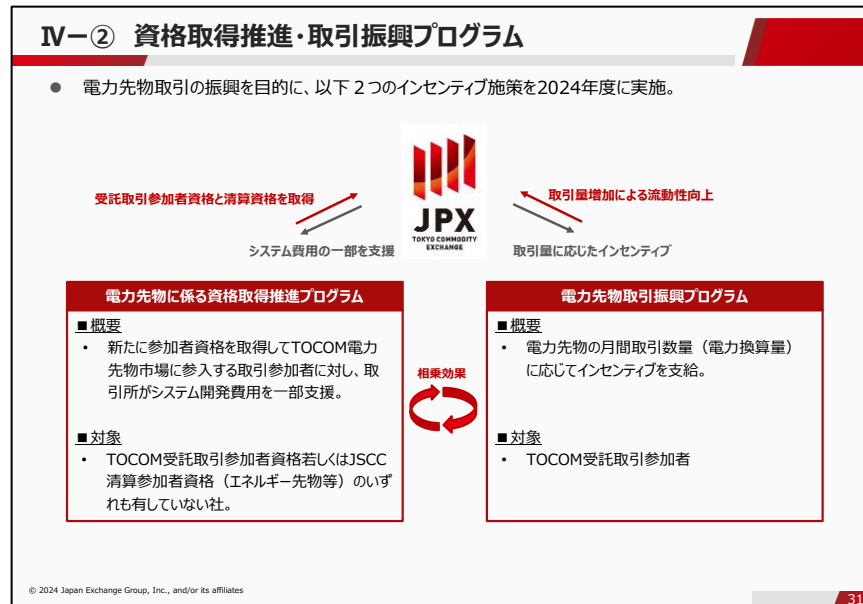
✓ フェーズ1では、TOCOMがJEPXから現物の約定データの連携を受け、先物ポジションと照合し、合致することの確認結果を電力会社へ返すことで、先物と現物の結び付きを証明。

✓ フェーズ2では、TOCOMからJEPXへのデータ連携により現物発注が行われる仕組みを構築し、ワンストップ・サービスを実現。

Role of Financial Institutions for Expansion of Power Futures

- In order to improve the liquidity of power futures, participation of not only firms but also non-firms (traders, financial institutions, etc.) is essential.
- There was an opinion that large-scale financial institutions do not participate as clearing participants, and that they are unable to insulate themselves from counterparty risk, thus avoiding large-lot transactions. Financially reliable financial institutions should also participate as clearing participants.

Incentives to promote qualification by TOCOM



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Importance of Transparent and Fair Transactions

- It is essential for authorities, market operators, and trading participants to supervise the market to ensure that prices are not arbitrarily set and that there is no illegal price manipulation between markets (inter-market market manipulation). It is also important to raise awareness of compliance among market participants.
- On the premise of transparency of transactions, improving market liquidity will eventually lead to transparent and fair market operation.
- We will continue to monitor commodity exchanges and similar institutions in accordance with laws and regulations.
- Although foreign commodity exchanges are not subject to regulation under the CDA, we have concluded an MoU with METI and the Electricity and Gas Transactions Surveillance Committee for EEX, which currently trades Japanese electricity futures, and are monitoring transactions.
- With regard to some OTC commodity derivatives transactions, there is no requirement to report transactions based on the CDA. We require the submission of certain transaction information for OTC commodity derivatives transactions as well, while considering the balance between the burden on businesses and the feasibility of supervision.