

## Preparing to respond to large-scale disasters and supply and demand constraints

In the event of a disaster or a supply–demand constraint, OCCTO proposes response while maintaining close communication and coordination with the national government and establishes a response team striving to maintain a stable supply of electricity. During normal times, OCCTO continues to conduct disaster-response drills to ensure a prompt response in the event of a disaster or supply–demand constraint and strives to improve the effectiveness of the business continuity plan (BCP) for disasters preparedness and other unforeseen circumstances.

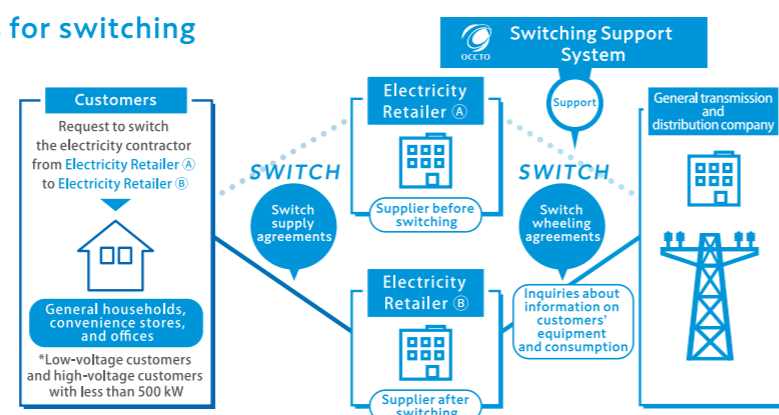
In addition, OCCTO is engaged in services that contribute to strengthened collaboration and prompt disaster recovery of general transmission and distribution companies in the event of a disaster, such as checks of the details of disaster coordination plans prepared by general transmission and distribution companies, acceptance of applications for mutual assistance systems for disaster recovery costs paid and collected across the country, and the grant of subsidies.

## Resolving disputes between electricity suppliers

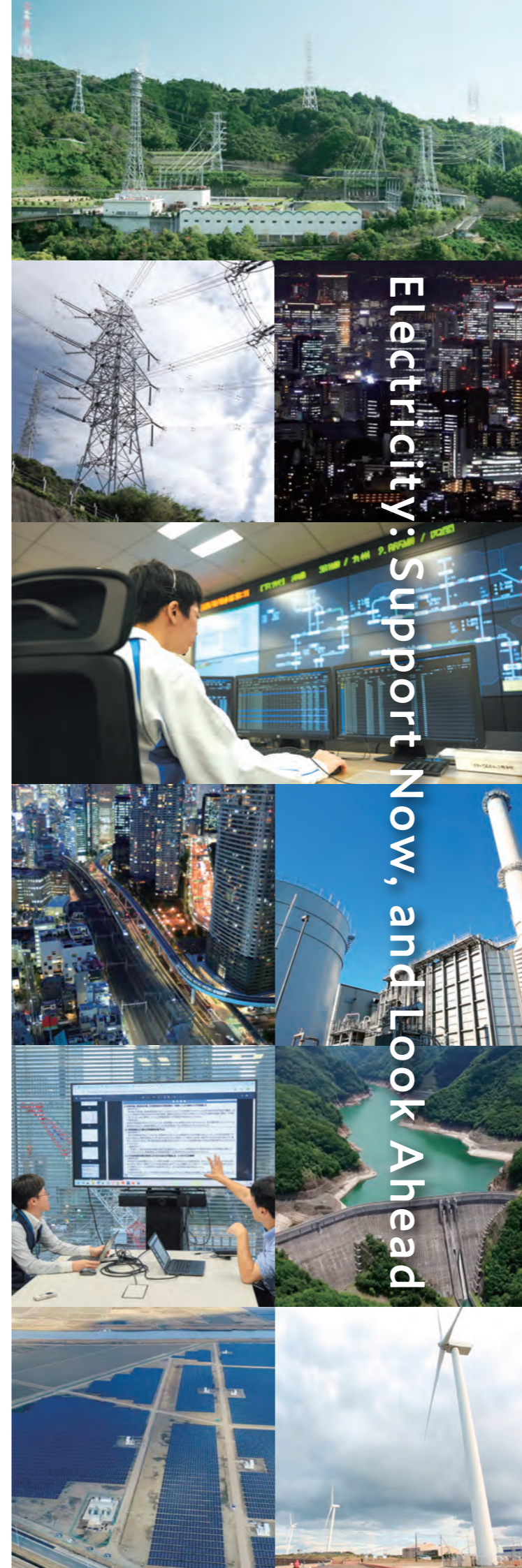
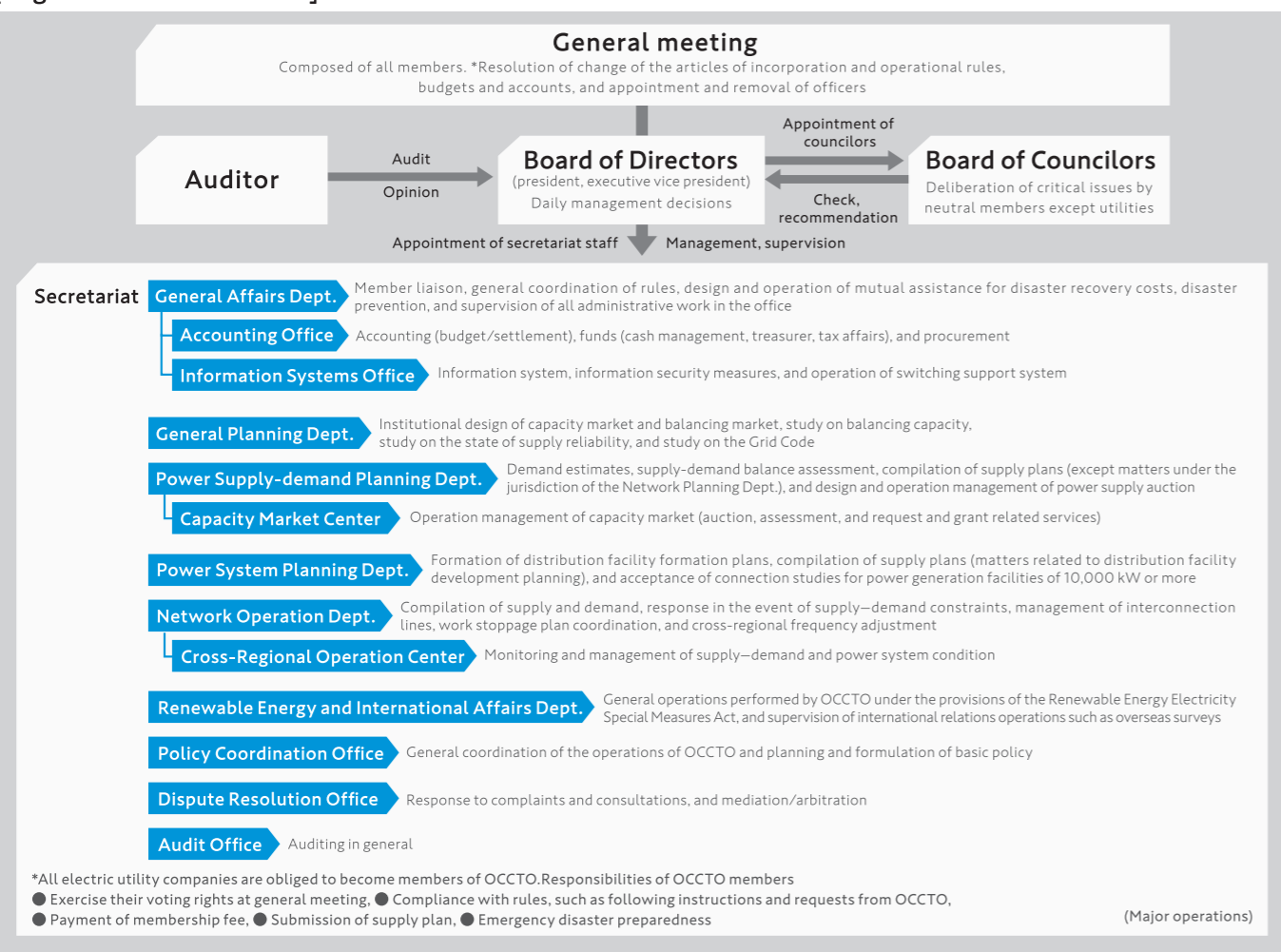
OCCTO accepts consultations and complaints about power transmission and distribution services from electricity suppliers. Also, OCCTO conducts settlement (mediation, arbitration) procedures as a certified dispute resolution business operator with certification of the Minister of Justice under the Act on Promotion of Use of Alternative Dispute Resolution.

## Supporting streamlining of procedures for switching

Electricity customers freely choose their electric retail companies (retail switching) due to the deregulation of electric retailing, though it is necessary to share massive information between retail companies and contract procedure for the actual retail switching. OCCTO operates switching support system, which shares necessary information for the contract procedure accurately and rapidly, and enables the environment for customers to choose their retail companies in assured manner.



### [Organizational Structure]



# Electricity: Support Now, and Look Ahead

The Organization for Cross-Regional Coordination of Transmission Operators (OCCTO) has been performing its duties from a neutral and impartial standpoint since its establishment in April 2015 in accordance with its establishment purposes: namely, to maintain a stable electricity supply and streamline the power supply system as far as possible.

These duties are wide-ranging, including (i) compiling supply plans of electric utility companies, (ii) monitoring nationwide supply-demand conditions and addressing supply and demand constraints, (iii) operating the capacity market to promote the ensuring of supply capacity, (iv) formulating cross-regional network development plans, and (v) developing rules on the enhancement of network utilization.

Also, to achieve carbon neutrality, OCCTO carries out the following operations: (i) operations for cost-sharing coordination and bidding under the Renewable Energy Special Measures Act, (ii) promotion of the planning process based on the master plan intended as the future network plan, (iii) addressing technical challenges in network operation associated with the mass introduction of renewable energy, and (iv) operation of the long-term decarbonized power supply auction.

As the expected role of OCCTO is greater than ever before, all officers and employees of OCCTO will work together to strive to support Japan's electric power system today and fulfill its important role for tomorrow.

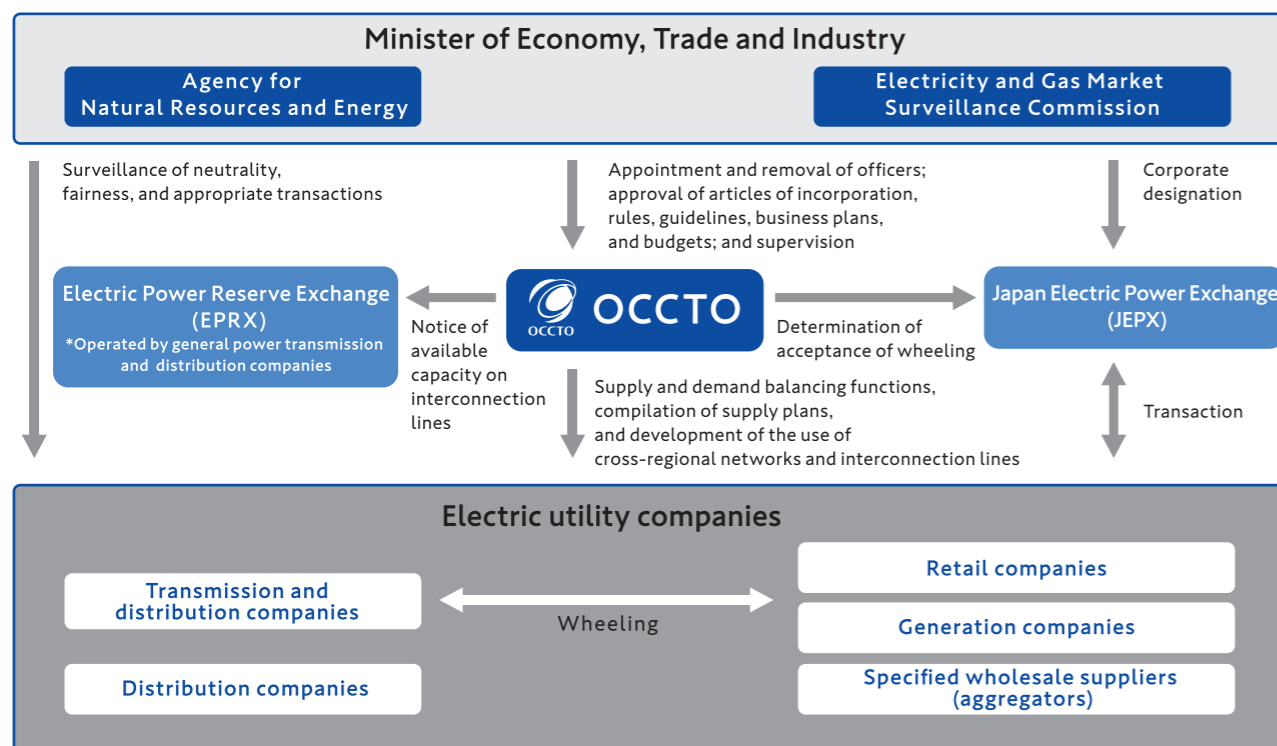
I respectfully ask for your continued support and encouragement.

June 2026  
Tsutomu Oyama, President



## About the Organization for Cross-Regional Coordination of Transmission Operators (OCCTO)

The Organization for Cross-Regional Coordination of Transmission Operators (OCCTO) was established in April 2015 as an organization with expertise and strong inter-operator coordination functions with the aim of promoting the development of power transmission and distribution grids necessary for cross-regional utilization of power sources and improving supply and demand balancing functions in normal and emergency situations throughout the country. As an authorized corporation under the Electricity Business Act, OCCTO conducts its business operations in a neutral and impartial manner.

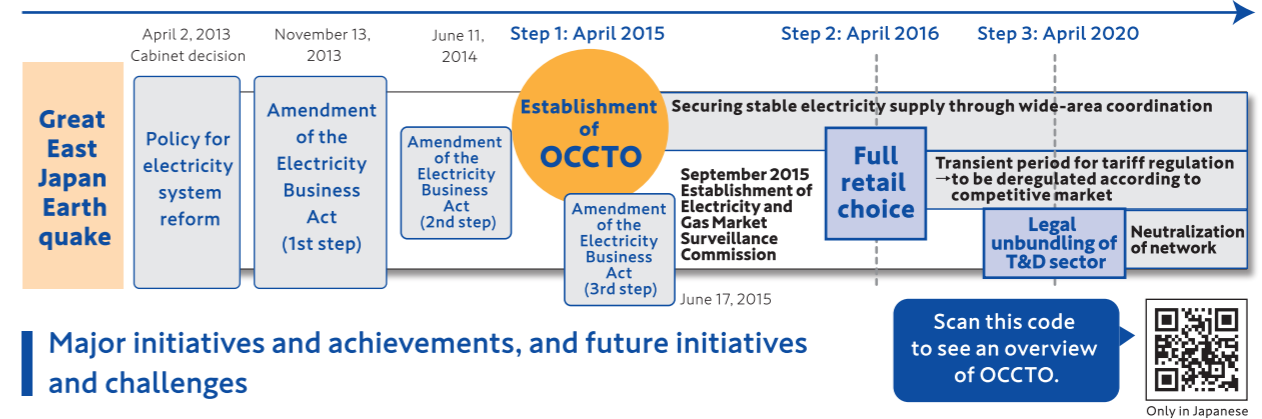


## Establishment of OCCTO

The Great East Japan Earthquake occurred in March 2011, and supply capacity for TEPCO service area was sharply decreased, and rotating blackout was implemented. In spite of sufficient supply capacity on a nationwide basis, transmission capacity among the areas had constraints to send electricity to the shortage area. To cope with this challenge, OCCTO was established in April 2015.

### Three goals of Electricity System Reform

- ① Securing stable electricity supply
- ② Suppressing electricity rates to the maximum extent possible
- ③ Expanding electricity choices for consumers and business opportunities



### Major initiatives and achievements, and future initiatives

Major initiatives and achievements	Future initiatives and challenges
<b>&lt; Shift to next-generation networks to use renewable energy as the main power source and strengthen electric power resilience &gt;</b>	
<ul style="list-style-type: none"> <li>Formulation of a long-term cross-regional network policy (master plan for cross-regional interconnection networks)</li> <li>Operation of subsidy and loan schemes to promote the development of cross-regional networks</li> <li>Formulation of a development plan of cross-regional interconnection lines</li> <li>Commencement of the planning process for cross-regional interconnection lines in eastern and central-western regions</li> </ul>	<ul style="list-style-type: none"> <li>Promotion of the planning process based on the master plan for cross-regional interconnection networks</li> <li>Embodiment and progress check of cross-regional network development plans, and review of construction cost</li> <li>Review of long-term cross-regional network policy</li> </ul>
<ul style="list-style-type: none"> <li>Formulation of rules for using cross-regional interconnection lines (introduction of implicit auction)</li> <li>Study and implementation of the Japanese version of Connect &amp; Manage</li> <li>Review of output curtailment implemented by N-1 intertrip scheme and congestion mitigation for network</li> <li>Development of estimation for network congestion in mid-to-long term</li> </ul>	<ul style="list-style-type: none"> <li>Further improvement and establishment of the Japanese version of Connect &amp; Manage</li> <li>Review of output curtailment implemented by N-1 intertrip scheme and congestion mitigation for network</li> <li>Development of estimation for network congestion in mid-to-long term</li> </ul>
<ul style="list-style-type: none"> <li>Acceptance of system impact studies, etc.</li> <li>Publication of network information (information on available transmission capacity)</li> <li>Acceptance of complaints, consultations, and dispute resolution from electricity suppliers</li> <li>Introduction of the collective study process for power connection projects</li> </ul>	<ul style="list-style-type: none"> <li>Acceptance of system impact studies, etc.</li> <li>Expanded publication of network information</li> <li>Acceptance of complaints, consultations, and dispute resolution from electricity suppliers</li> <li>Introduction of a new reinforcement process to local networks</li> </ul>
<ul style="list-style-type: none"> <li>Checking the details of disaster coordination plans</li> <li>Operation of mutual assistance systems for disaster recovery costs</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced check of extension of disaster coordination plans</li> <li>Long-term stable operation of mutual assistance systems for disaster recovery costs</li> </ul>
<b>&lt; Supply-demand management through supply-demand balancing assessment by supply planning and supply-demand verification &gt;</b>	
<ul style="list-style-type: none"> <li>Supply plan aggregation</li> <li>Development of national demand forecast</li> <li>Verification of electricity supply-demand in summer and winter</li> <li>Development of supply-demand scenarios targeting 2040 and 2050</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced understanding of information through supply planning</li> <li>Study of future supply-demand scenarios over a decade</li> <li>Study of the structural changes in demand forecast</li> </ul>
<ul style="list-style-type: none"> <li>Planning and management of power generation and demand through the OCCTO system</li> <li>Monitoring of the national supply-demand situation and network operation status</li> <li>Verification of output curtailment</li> <li>Electricity supply-demand monitoring for early detection of signs of supply-demand condition deterioration</li> </ul>	<ul style="list-style-type: none"> <li>Planning and management of power generation and demand through the OCCTO system</li> <li>Monitoring of the national supply-demand situation and network operation status</li> <li>Verification of output curtailment</li> <li>Promotion of measures to mitigate increased output curtailment</li> <li>Continued electricity supply-demand monitoring, enhanced information provision</li> </ul>
<ul style="list-style-type: none"> <li>Electric power exchange instruction in the event of supply-demand constraints</li> <li>Review of the operation of cross-regional interconnection lines</li> <li>Enhanced communication with mass media and general customers</li> </ul>	<ul style="list-style-type: none"> <li>Enforced response in the event of supply-demand constraints (promotion of readiness to provide supply capacity based on cross-regional reserve margin)</li> <li>Promotion of the efficient use of cross-regional interconnection lines</li> <li>Enhanced communication with mass media and general customers</li> </ul>
<b>&lt; Ensuring supply capacity for a stable electricity supply &gt;</b>	
<ul style="list-style-type: none"> <li>Establishment of capacity market</li> <li>Establishment of long-term decarbonized capacity auction</li> <li>Introduction of supply-demand balancing market</li> <li>Introduction of strategic reserve scheme</li> </ul>	<ul style="list-style-type: none"> <li>Stable operation of the capacity market, I</li> <li>Embodiment and validation of a market that can simultaneously trade supply capacity and balancing capacity (co-optimization market)</li> <li>Support for the full-scale operation of the supply-demand balancing market</li> </ul>
<b>&lt; Implementation of FIT/FIP subsidy operation and reserve fund management for solar panel disposal costs &gt;</b>	
<ul style="list-style-type: none"> <li>Operation of FIT and FIP schemes</li> <li>Operation of a reserve system for disposal costs of solar power generation facilities</li> <li>Conduct of fund management operations</li> </ul>	<ul style="list-style-type: none"> <li>Improvements to FIT and FIP schemes</li> <li>Operation of a reserve system for disposal costs of solar power generation facilities</li> <li>Improvement of fund management operations</li> </ul>

# Ensuring a stable electricity supply on a short

## Aggregating supply plans to ensure a stable electricity supply on a short-term to a medium- or long-term basis

A supply plan outlines the supply and demand projection and the development of new power plants and power grids for the next decade, which is required to be submitted by all utility companies to the national government under the Electricity Business Act. OCCTO aggregates supply plans to centrally understand and assess the supply and demand balance both nationwide and for each supply area individually on a short-term to a medium- or long-term basis. A stable electricity supply is also ensured by using capacity auctions as required.

### Study of future supply–demand scenarios

Possible scenarios of future electricity supply and demand beyond the current supply plan (for a decade) are shared for study purposes among the national government, OCCTO, electric utility companies, and other stakeholders as a reference for the smooth implementation of measures and the systematic promotion of power supply development.

## Contributing to streamlining and activating electricity market while keeping up with the times

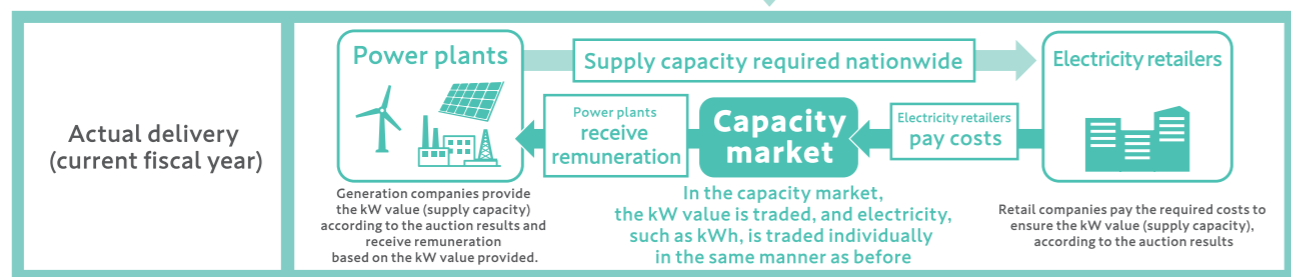
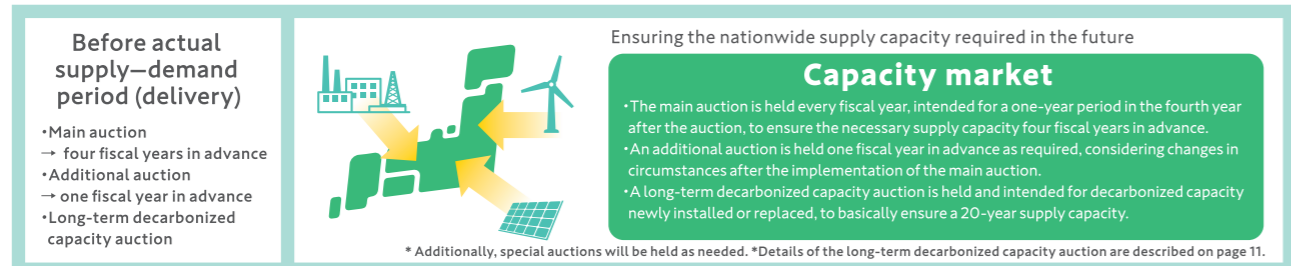
With the unbundling of T&D sector in 2020 and the greater integration of renewable energy, OCCTO continues to study, design in detail, and operate a new market for trading the value of electricity to create a mechanism to ensure and utilize the *supply capacity* and the *balancing capacity* necessary for a medium- to long-term stable supply at the lowest possible cost.

Value to be traded		Trading market
Amount of electricity [kWh value]	Actual electricity generated	Wholesale electricity market
Supply capacity [kW value]	Capacity to generate electricity	Capacity market
Balancing capacity [ΔkW value]	Capacity to balance supply–demand in a short time	Supply–demand balancing market

### Study, detailed design, and operation of Capacity Market

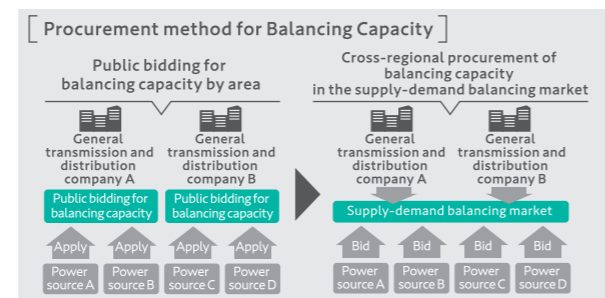
With electricity deregulation and the greater integration of renewable energy, the predictability of the return on electricity investment is considered to be circumstantially decreased, and a shortfall in investment in electricity sources could lead to electricity shortages in the future. The capacity market evaluates the supply capacity of power sources (capacity to generate electricity) to efficiently ensure the necessary supply capacity in advance for the future, which is an important mechanism that increases the predictability of investment returns by power generating companies and contributes to ensuring the supply capacity on a medium- to long-term basis. OCCTO is a market administrator for the capacity market by studying, designing in detail, and operating the system.

Scan this code to see details of the Capacity Market.



### Study and detailed design of Supply–demand Balancing Market

Balancing capacity necessary for coordinating supply–demand of electric network was procured publicly by general transmission and distribution companies for their service areas. Since April 2021, supply–demand balancing market was established and balancing capacity was started to be procured on a nationwide basis gradually. In fiscal year 2024, entire balancing capacity was procured on a nationwide basis, thus contributes to efficient maintenance and operation of electric network.



\*Market trading of balancing capacity starts partially in FY 2021 and fully in FY 2024.

# -term to a medium- or long-term basis

## Formulating a long-term cross-regional network policy and taking the initiative for necessary equipment reinforcement

OCCTO formulated a long-term cross-regional network policy that provides direction for the development and renewal of nationwide cross-regional interconnection networks and a cross-regional network development plan in accordance with this policy.

Under the circumstances, legislation was developed under the Energy Supply Resilience Act to systematically address a cross-regional interconnection development in a push-type manner, taking into consideration the future power potential.

In response to this legislation, in March 2023, OCCTO reflected the long-term perspective for the development of cross-regional networks that ensure consistency with the energy policy toward achieving carbon neutrality by 2050 and the direction of efforts toward the achievement in the long-term cross-regional network policy (master plan for cross-regional interconnection networks).

Thereafter, based on the policy OCCTO proceeds with the development plans of cross-regional interconnection lines between Chubu and Kansai, and Chugoku and Kyushu.

Scan this code to see details of a cross-regional network development plan.



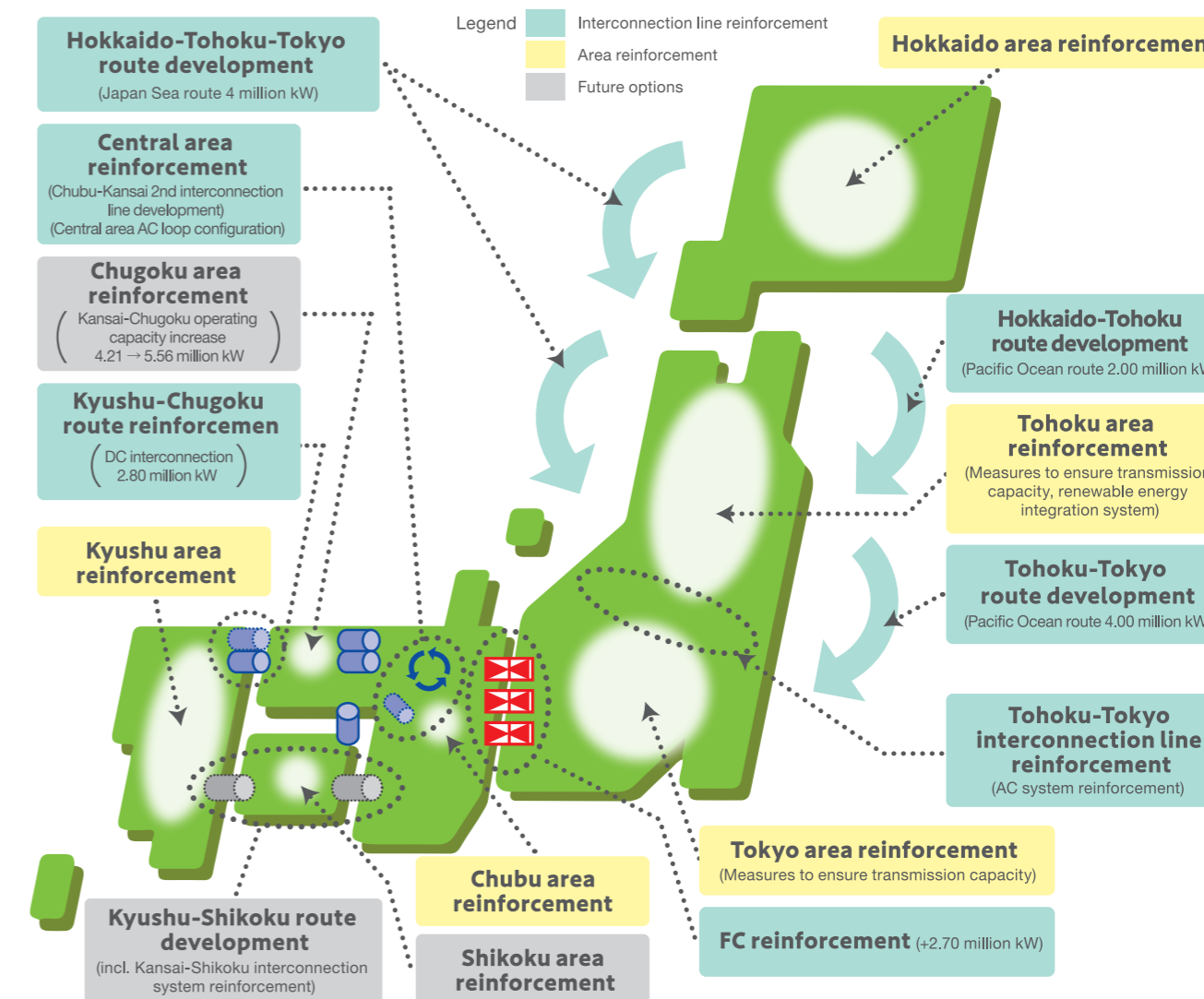
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Scan this code to see details of a long-term cross-regional network policy.



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### Long-term perspective for the development of cross-regional interconnections



**Necessary investment**<sup>1</sup> **Approx. 6.0 to 7.0 trillion yen**    **Cost-benefit ratio (B/C)**<sup>1</sup> **0.7 to 1.5**  
**Annual cost**<sup>1,2</sup> **Approx. 550 to 640 billion yen per year**  
 Renewable energy ratio: 47% (50% after reinforcement/43% before reinforcement)/Output curtailment rate: 12% (7% after reinforcement/22% before reinforcement)  
 Figures in parentheses are reference values when inviting the sites of power supply side as a measure other than the network reinforcement.  
<sup>1</sup>: Estimated considering the HVDC cost range  
<sup>2</sup>: Calculated as the annual expense ratio shown on the right based on the amount of expenses: Over-head transmission (7.9%), Underground transmission (9.0%), Substation (10.7%)

The Long-Term Cross-Regional Network Policy (Master Plan for Cross-Regional Interconnection Networks) was formulated with the view of achieving carbon neutrality by 2050.

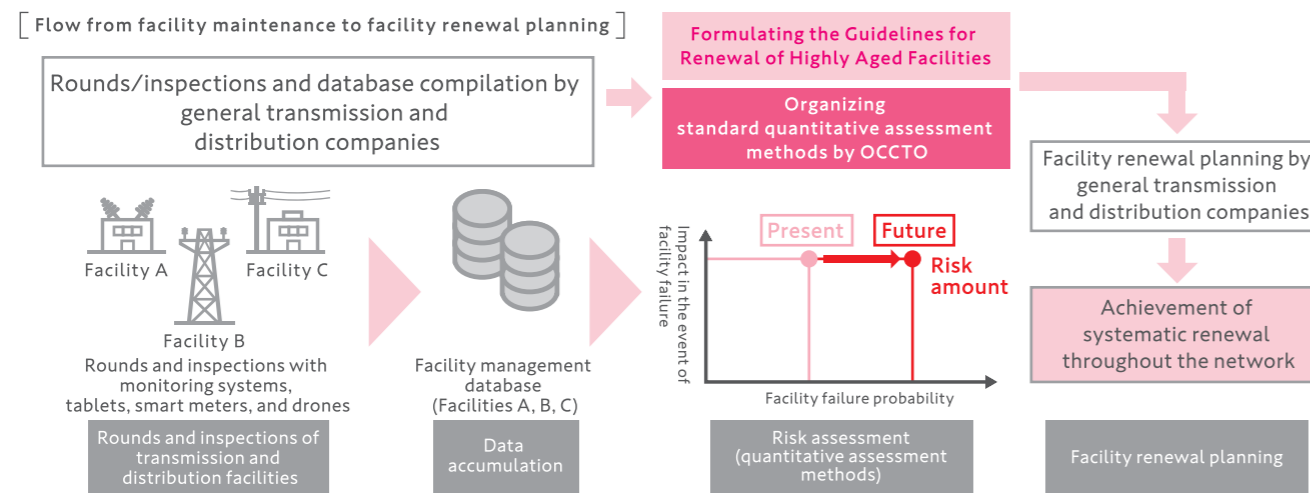
# Promoting fair, equitable, and efficient use of transmission and distribution systems

## Formulating rules to be followed by electric utility companies

OCCTO formulates and updates as required Network Codes, which are the rules to be followed by network operators and network users, such as general transmission and distribution companies, transmission companies, and distribution companies under the Electricity Business Act. This ensures the proper and smooth operation of wheeling services and electricity transmission and distribution services.

## Formulating rules for facility renewal

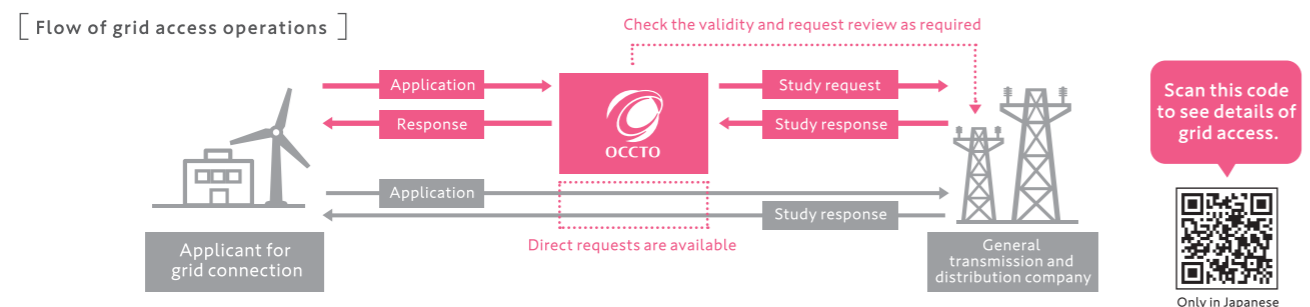
OCCTO formulated the Guidelines for Renewal of Highly Aged Facilities, which provides a standard facility risk assessment method common to 10 general transmission and distribution companies. In accordance with these Guidelines, each general transmission and distribution company assesses the risk amount (= facility failure probability x failure impact) for each facility, calculates the renewal amount for each facility based on the risk amount assessed and construction capability, and reflects them in the facility renewal plan.



## Accepting applications for system impact study for power generation facilities

OCCTO is responsible for establishing mechanisms and rules for grid access, which are the procedures for connecting power generation facilities to a power grid; for example, OCCTO organizes a mechanism, such as a collective study process, for power connection projects in which multiple power sources jointly share the cost of reinforcing transmission and substation facilities involving connection.

Also, OCCTO is engaged in the duties of accepting applications for grid access by applicants for grid connection of their power generation facilities and verifying the results of study conducted by the general transmission and distribution company.



## Making efforts for efficient use of power grids

To promote the integration of renewable energy, while maximizing the use of existing transmission and substation facilities, OCCTO continues with Connect & Manage (such as the N-1 Inter-trip scheme and non-firm connection), which allows flexible power supply connection on the premise of appropriate management during grid congestion, by revising the previous approach of not allowing new power supply connections until the grid is reinforced if there is no available capacity based on the maximum output of existing power generation facilities.

Furthermore, in order to extract as much value as possible from the connected power source, a redispatching method is introduced into the backbone grid as a congestion management method.

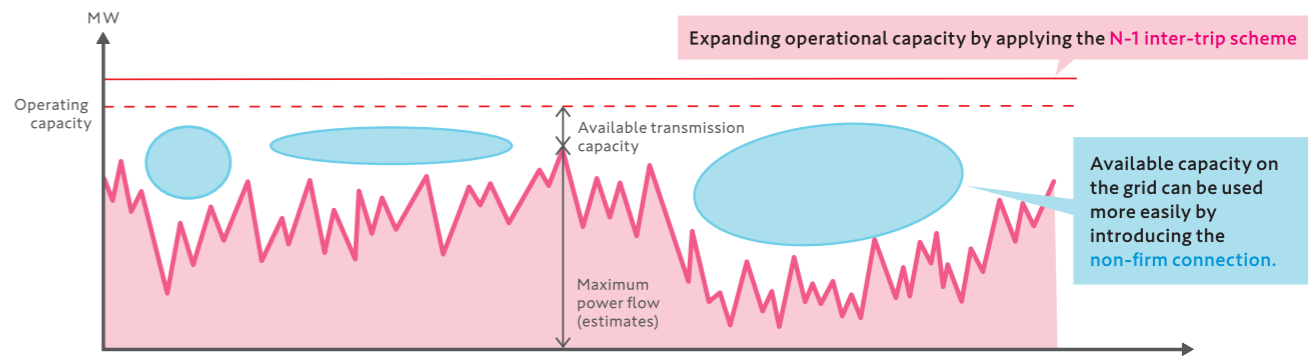
### Connect & Manage

#### N-1 Inter-trip scheme

In Japan, in terms of grid reliability, facilities are constructed to ensure stable transmission capacity even in the event of an N-1 failure, such as a failure of one of the transmission lines that usually have two circuits. The N-1 inter-trip scheme is a system that allows the capacity to be utilized during normal situations by limiting power supply in the event of an N-1 failure.

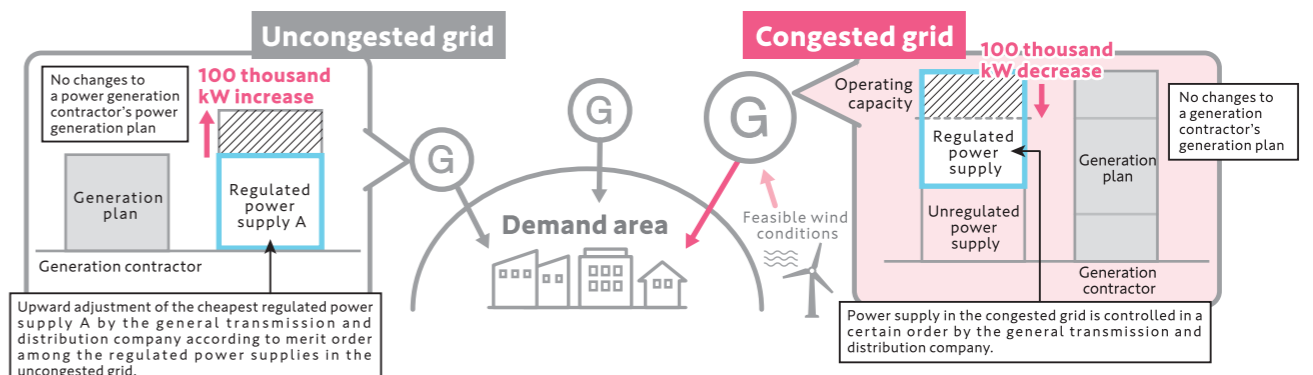
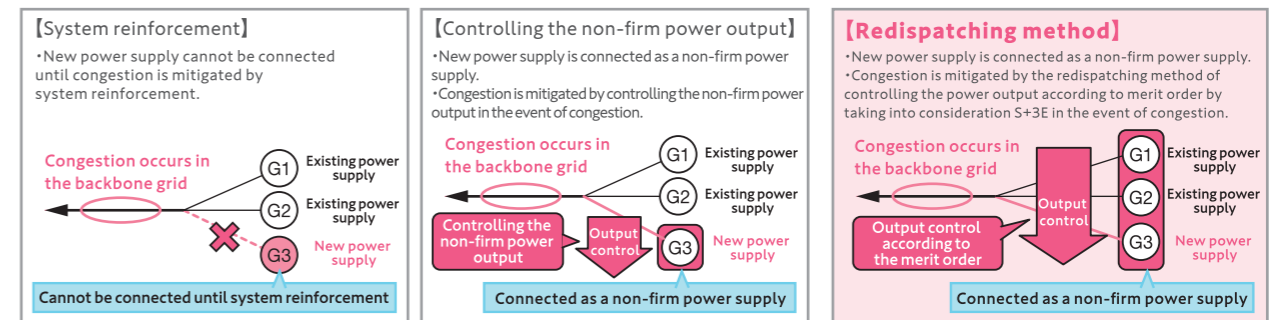
#### Non-firm connection

This is a new approach to power supply connection to allow operation when there is availability on the grid by connecting new power sources to the grid without system reinforcement, assuming output control during grid congestion.



### Redispatching method

The redispatching method is a method of controlling the power output according to merit order by taking into consideration the stable supply, in contrast to the method of controlling the non-firm power output in managing grid congestion. Specifically, in order to mitigate congestion in the backbone grid, the output of the power output connected to the backbone grid will be curtailed in a certain sequence, and the output of regulated power supply in the uncongested grid will be controlled based on merit order according to the amount of power shortage caused thereby to match the power supply and demand.



Congestion management method for local grid is implemented by the output curtailment based on the redispatching method (certain order), while non-firm connected generators other than balancing generators are managed by the changing values of generation plans.



## Realizing stable supply through formulation of rules for using interconnection lines and monitoring and operation of national supply and demand situation and network

### Monitoring the supply–demand situation and network operation 24 hours a day, 365 days a year

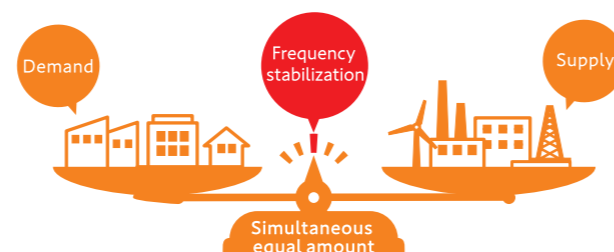
Interconnection lines connecting regions across the country have three functions: (i) stable supply (reducing power outage), (ii) economic efficiency (transmission of cheaper electricity), and (iii) environmental performance (utilization of renewable energy). OCCTO monitors nationwide transmission line operations and supply and demand situation on a real-time basis 24 hours a day, 365 days a year, and promptly and accurately provides power exchange instructions in the event of power line accidents or deteriorated supply–demand condition so that interconnection lines can fulfill these functions.

In addition to monitoring the real-time supply and demand situation in each supply area, OCCTO also compiles nationwide supply and demand estimates on a short- to medium-term basis to provide an early perspective on the supply and demand situation. Supply and demand estimates are published to fully inform utility companies throughout the country.

- Monitoring the operation and work stoppage of major generators in the country
- Monitoring the utilization of cross-regional interconnection lines connecting supply areas through market transactions
- Monitoring and publication of the operational status of the national cross-regional interconnection networks, including inter-regional interconnection lines
- Compilation and publication of annual to daily supply and demand conditions for each supply area

### Supply–demand balance

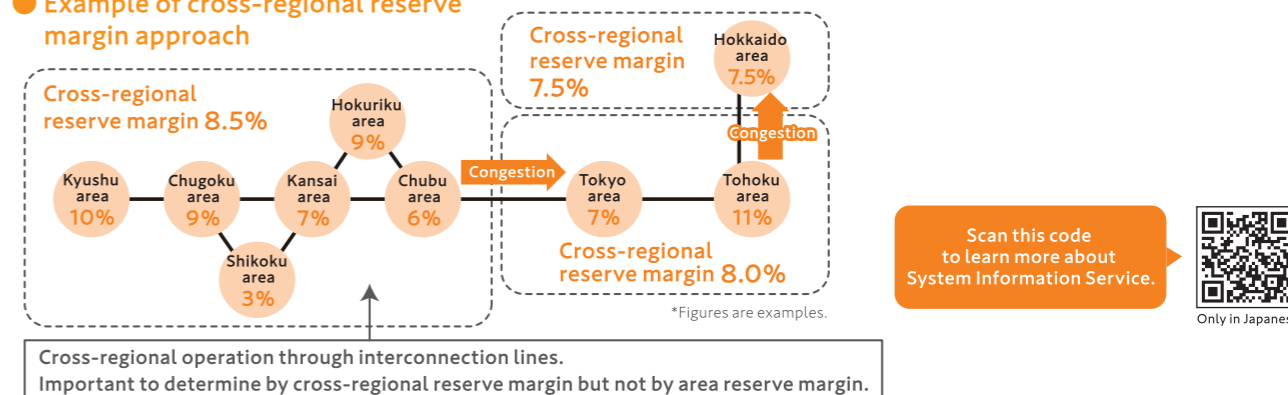
As electricity cannot be stored in large quantities, supply and demand need to always match for a stable supply. When that balance is lost, the frequency is disrupted, and in the worst cases, this could lead to a major power outage.



### Supply-demand operation based on cross-regional reserve margin

As supply capacity and balancing capacity are utilized cross-regionally, it is important to grasp the supply and demand situation with a cross-regional reserve margin. OCCTO communicates supply and demand information with the cross-regional reserve margin updated every 30 minutes based on the latest demand forecast and power generation plan of the utility companies.

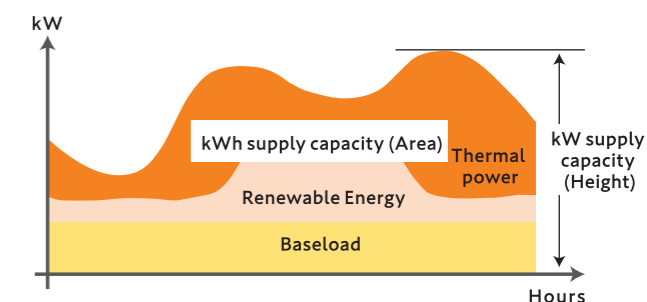
#### Example of cross-regional reserve margin approach



Cross-regional operation through interconnection lines. Important to determine by cross-regional reserve margin but not by area reserve margin.

### Electricity supply-demand monitoring

For the purpose of early detection of signs of supply–demand deterioration, OCCTO conducts monitoring from two points: kilowatts (kW) and kilowatt-hours (kWh) during high demand period and publishes the data.



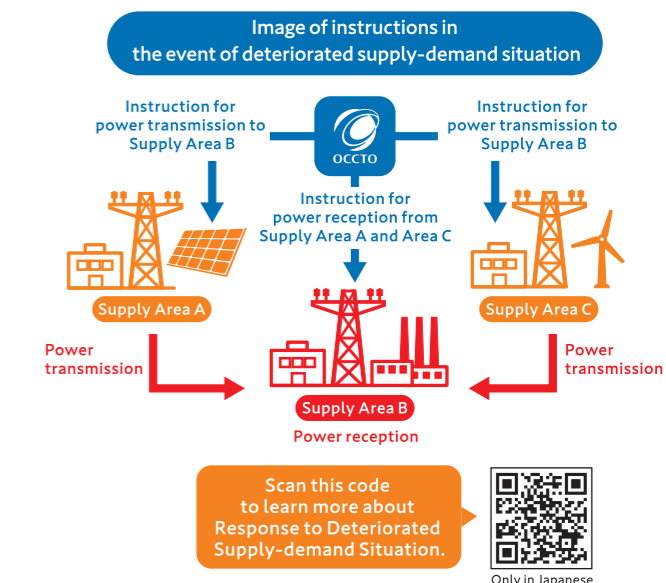
### Providing instructions to utility companies in the event of deteriorated supply-demand situation

#### Supply instructions by OCCTO

In the event of deterioration in the supply and demand situation due to disasters or power supply problems, supply and demand stabilization can be promoted by exchanging power via interconnected lines across the country.

OCCTO acts as a command post, and checks and coordinate information immediately. With the aim of maintaining a stable supply across the country, OCCTO provides instructions to general transmission and distribution companies that are members of OCCTO for transmitting and receiving power.

OCCTO provides instructions, not only in the event of supply–demand constraints but also in the event of excessive power supply and continued difficulty in balancing supply and demand even after power output curtailment in the area.



### Conducting technical studies on transmission lines throughout the country

In order for an interconnection line to fully fulfill its three functions, the area transmission line connected to the interconnection line plays an important role.

For this purpose, OCCTO addresses studies on technical aspects and operating rules of nationwide transmission lines, including interconnection lines, and reflects and publishes the study results.

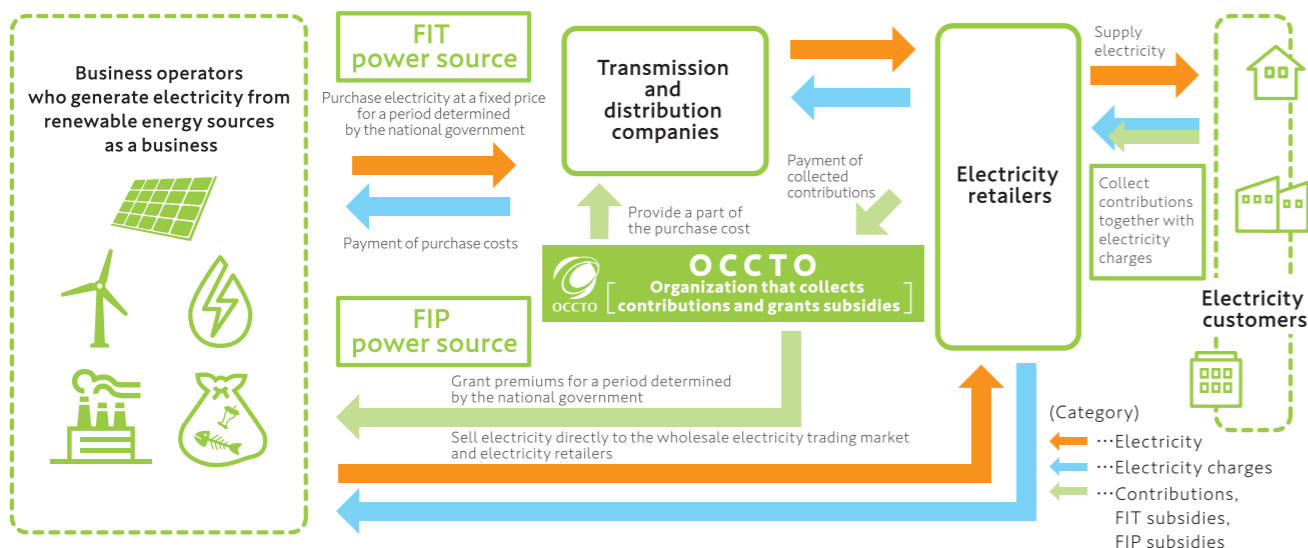
Also, in order to use transmission lines as effectively as possible, OCCTO conducts and publishes a study on the coordination of periods during which transmission lines are shut down due to repair work or other maintenance.

- Study and publication on transmission capacity of interconnection lines
- Study for reducing the risk of large-scale power outages and shortening recovery time in the event of a major power outage
- Coordination of periods of maintenance schedule nationwide for major transmission lines and main power plants including interconnection lines

# Supporting expansion of the use of decarbonized capacity to achieve carbon neutrality

## Responsible for a wide range of tasks to greater integration of renewable energy

To expand the use of renewable energy, OCCTO provides the operation services for the Feed-in Tariff scheme (FIT scheme) that is a system to purchase renewable energy at a fixed price, and the Feed-in Premium scheme (FIP scheme) that is a system that grants a certain premium based on market prices.



## FIT/FIP scheme

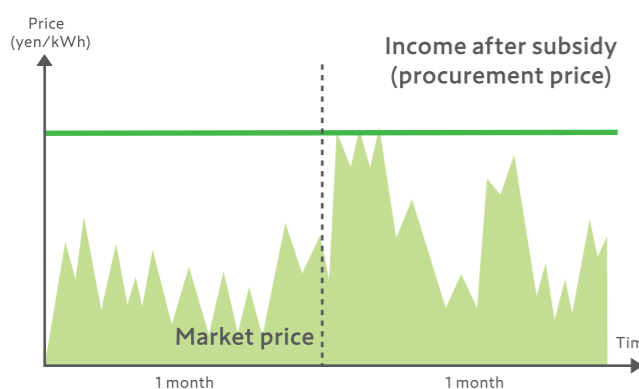
FIT scheme is a scheme in which the national government guarantees that electric power companies will purchase electricity generated from renewable energy sources for a certain period of time at a fixed price. OCCTO provides services of calculating and determining the amount of subsidies based on the amount obtained by multiplying the procurement price by the amount of renewable energy electricity purchased and then deducting the avoidable cost (calculated from the market price) from it and granting subsidies to the respective electricity purchasing companies.

FIP scheme is a scheme that provides support to ensure investment incentives while encouraging integration into the electricity market as a step toward the independence of renewable energy. OCCTO provides services of calculating and determining the amount of premiums based on the base price after subtracting the reference price (income expected from market transactions) by the amount of renewable energy power supply and granting premiums to the respective certified business operators.



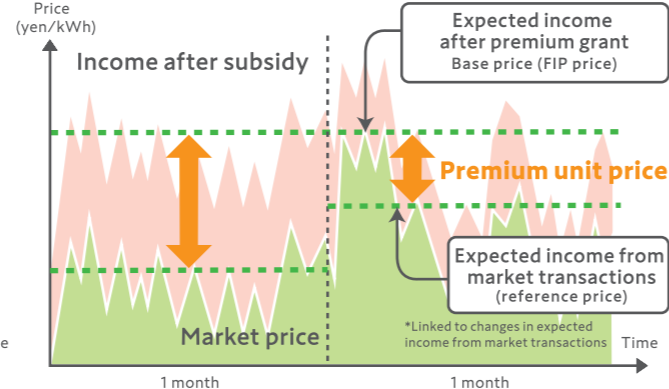
**FIT scheme** Price is constant and income is the same regardless of when power is generated.

No incentive to increase supply during peak demand periods (when market prices are high)



**FIP scheme** The subsidy (premium) is fixed, and income is linked to market prices.

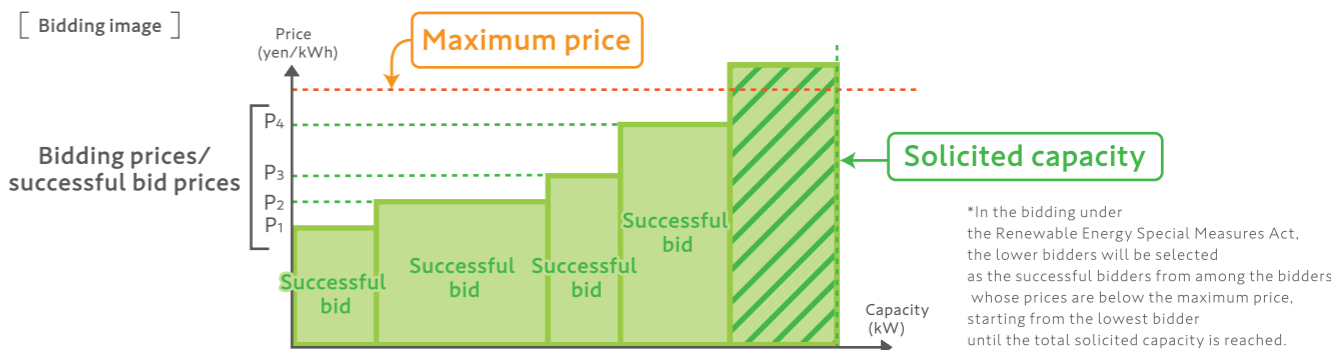
There is an incentive to increase supply through the use of storage batteries during peak demand periods (when market prices are high)  
\*Premiums are updated monthly in conjunction with the reference price and are not granted for electricity supply during the hours when output curtailment would occur.



Base price – Reference price = Premium unit price

## Bidding system

This is a system in which procurement prices and base prices are determined by bidding to achieve both the maximum integration of renewable energy and a reduction in the cost allocation to the public. OCCTO provides bidding services (including conduct of bidding, determination of successful bidders, and management of participating bidders) under FIT and FIP schemes.



## Reserve system for disposal costs of solar power generation facilities

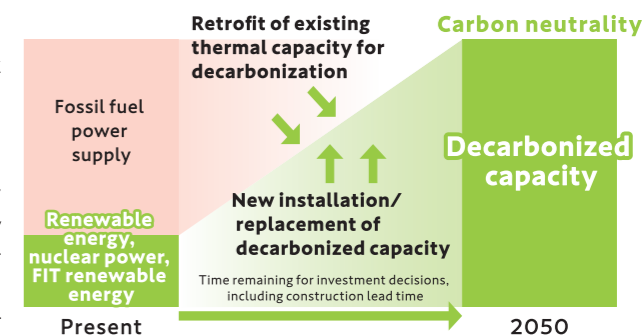
This system requires certified business operators to maintain a reserve for disposal costs (basically, an external reserve in the form of withholding tax) to ensure a reliable accumulation of disposal costs by targeting all solar power generation projects of 10 kW or more that obtained a FIT/FIP certificate. OCCTO provides management services and response to request for withdrawal of external reserves.

## Operating a long-term decarbonized capacity auction toward expansion of the use of decarbonized capacity

Aiming to achieve carbon neutrality by 2050, a long-term decarbonized capacity auction started in FY 2023 to control the risk with stable supply and price escalation risk from a medium- to long-term perspective as well as to offer the value of decarbonized electricity to consumers.

Before the introduction of the long-term decarbonized capacity auction, provision of supply capacity and evaluation of supply capacity (kW value) were achieved by a main auction for a single year, but for utility operators who make large amounts of new investments in decarbonized capacity, it will be important to provide predictability for the long-term return on investment.

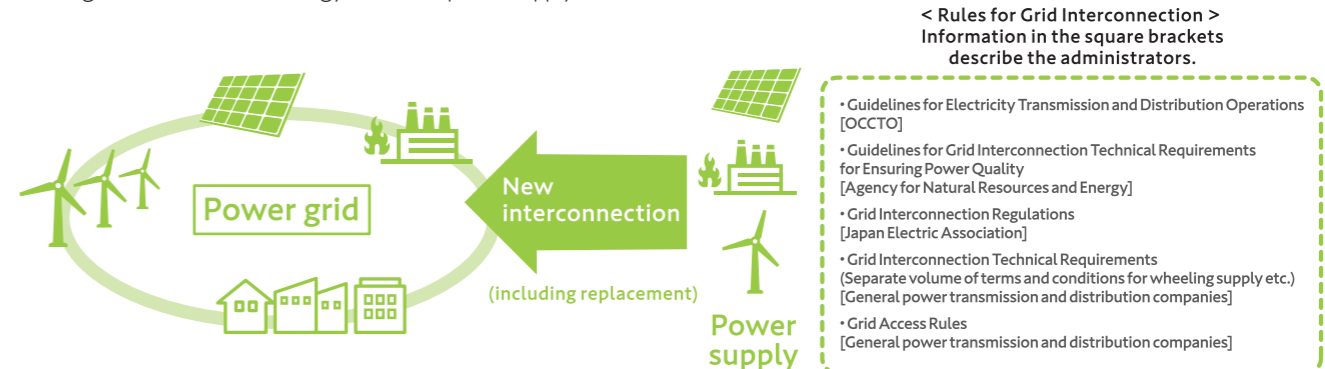
Therefore, a long-term decarbonized capacity auction was established as part of the capacity market for new investments in decarbonized capacity, and OCCTO operates the market.



## Developing the rules (Grid Code) to be followed by power sources connected to the electric power grid

In order to achieve both carbon neutrality and stable supply of electricity, rules are needed when power sources are connected to the power grid. The rules are called the Grid Code, and OCCTO considers rules that define the roles of different types of power sources based on their characteristics.

The Grid Code under consideration will be reflected in the relevant rules as appropriate with the aim of achieving both the greater integration of renewable energy and stable power supply.



## Promoting the power system resilience in Japan through international activities

As a global movement, we are committed to efforts toward a decarbonized society, response to the changing energy situation, and technological advancements in the electric power industry. OCCTO collaborates with relevant overseas organizations and collects information as reference for making Japan's power system more resilient and economically rational for the future.