

TEPCO's DX/GX Initiatives and Future Direction

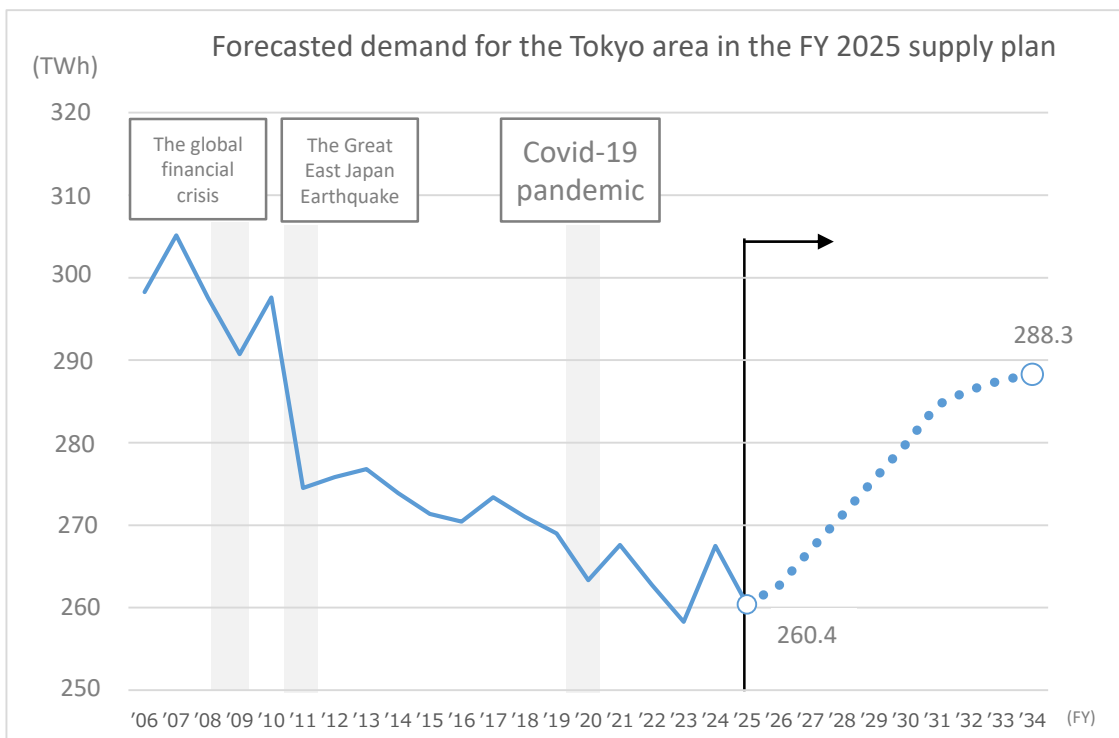
May 16, 2025

Tokyo Electric Power Company Holdings, Inc.

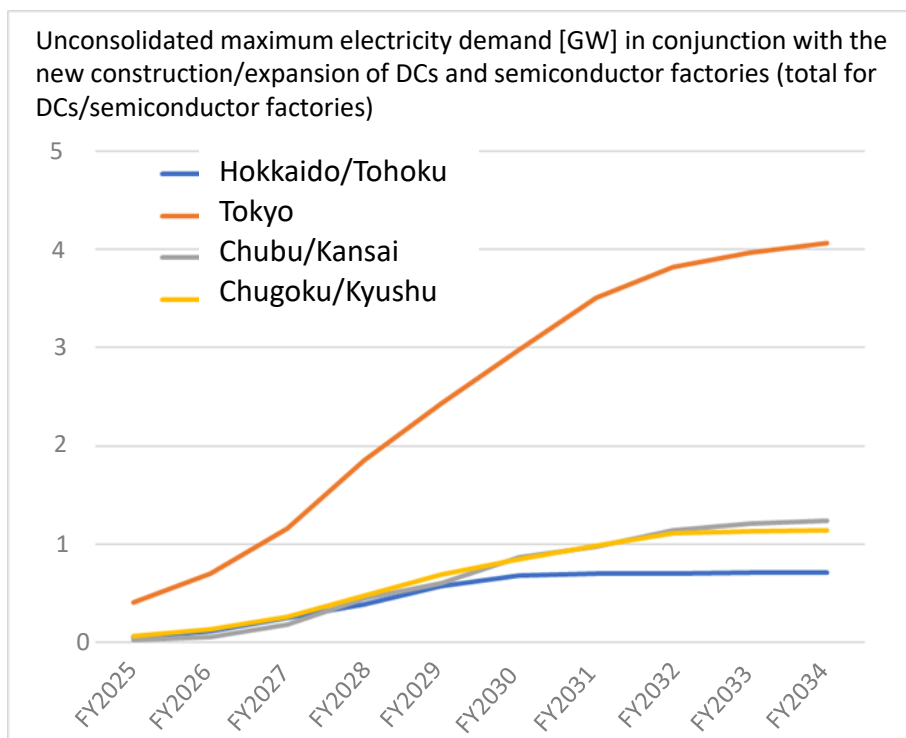
1. Changes in the external environment

- It is predicted that electricity consumption (kWh) and electricity demand (kW) will increase in the future with newly built and expanded data centers (DCs) and semiconductor factories.
- There is a growing trend for global DC operators to want to quickly acquire a stable supply of decarbonized power sources.
- Therefore, to address these demand-side needs, we need to accelerate the creation of supply-side infrastructure and further supply capacity, and decarbonization.

Forecasted electricity consumption in the Tokyo area



Impact of newly built and expanded DCs



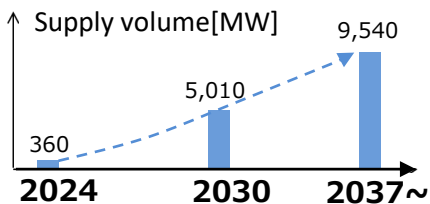
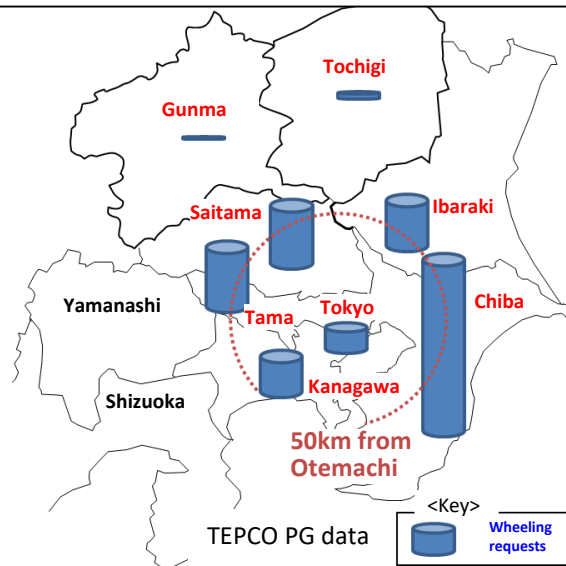
Source: National and Supply Area Demand Forecasts (FY2025)

Organization for Cross-regional Coordination of Transmission Operators, JAPAN

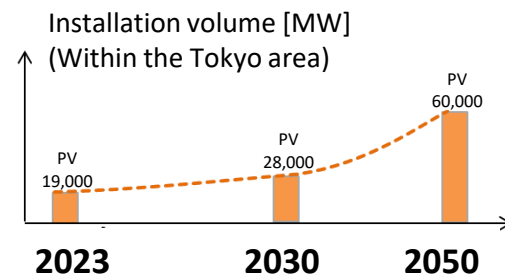
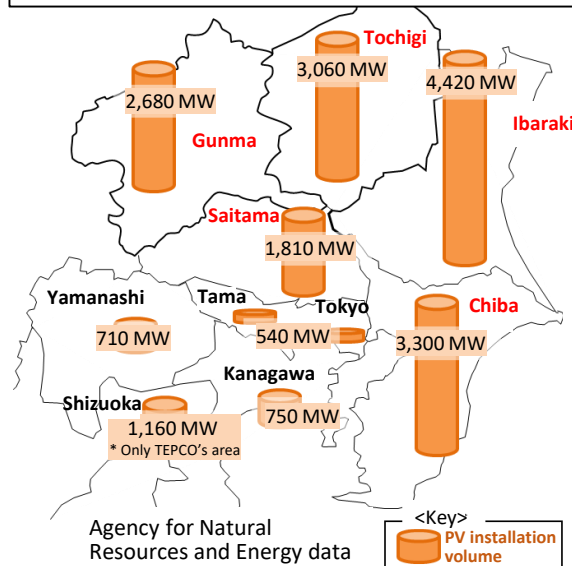
1. Changes in the external environment

- In regards to newly built DCs, whereas we have had a lot of wheeling requests within a 50km radius of Otemachi, Tokyo, the majority of photovoltaic (PV) power generation facilities have been built outside that 50km radius.
- **An advanced network must be created** in order to acquire newly built DC demand and effectively leverage renewables within TEPCO's coverage area (Tokyo area).
- Since there will be an increase in the required amount of adjustment capability in conjunction with the installation of renewables, it is also **necessary to secure/expand adjustment capability (on both supply and demand sides)**.

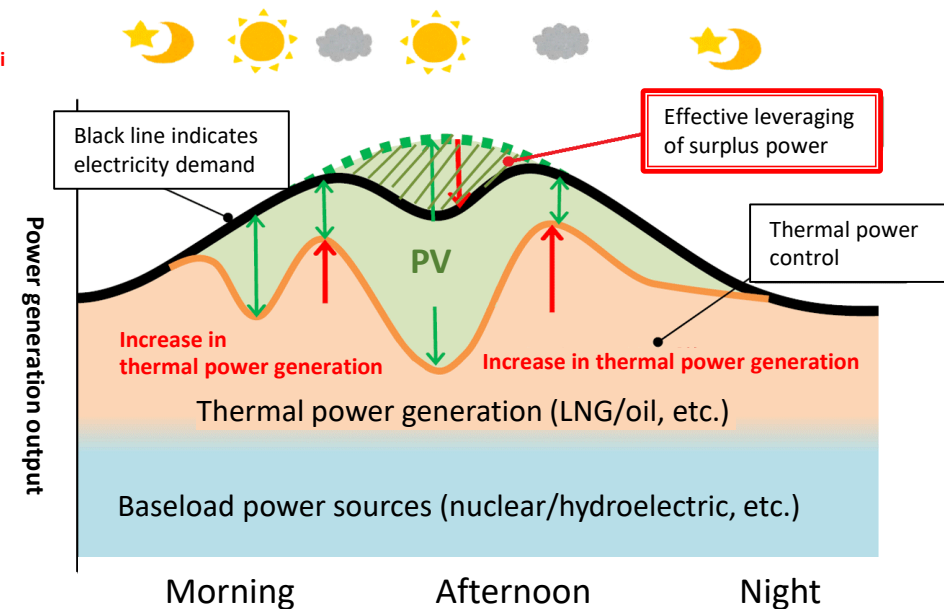
DC wheeling requests (as of the end of August 2024)
- Breakdown of approx. 9,500 MW by Prefecture -



PV facility installation (as of the end of March 2024)
- Breakdown of approx. 19,000 MW by prefecture -



Power supply-demand concept diagram



Created by the Agency for Natural Resources and Energy

2. TEPCO's response to changes in the external environment

<Addressing increases in DC demand> (Network)

- Speed is a necessity when it comes to meeting current DC demand, so we have created a **Welcome Zone Map** that shows where power can be quickly provided. Being more efficient at system formation is also important for addressing grid issues.
- In the Inzai area in Chiba Prefecture, which has seen a remarkable increase in electricity demand in conjunction with the new construction of DCs, **we have significantly shortened the time required from the planning to the completion of construction of the Chiba Inzai Substation.**

<Addressing increases in renewable energies> (Adjustment capability)

- To address current increases in renewable energies, **existing networks can be effectively leveraged by ensuring/expanding adjustment capability.**
- Therefore, in addition to **introducing grid-connected batteries on the supply-side**, on the **demand-side we are introducing customer-linked facility services**, such as **battery storage systems (combined with PV power generation, etc.)**, **Ohisama EcoCute (water heater that heats water during the daytime using electricity generated by PV power generation)**, and **hydrogen projects combined with PV power generation, etc.**
- These initiatives are **contributing to the promotion of GX (Green Transformation).**

<Addressing decarbonized power source needs> (Power source)

- Speed and supply quantity are necessities when it comes to decarbonized power sources, so in addition to engaging in mid/long-term **offshore wind power projects**, TEPCO is also **repowering hydroelectric power stations** while also aiming to **restart nuclear power stations.**

3. Addressing increases in DC demand (Network)

<Welcome Zone Map/Chiba Inzai Substation>

- TEPCO Power Grid has created a **Welcome Zone Map** for operators deliberating the new construction of DCs to **entice them to areas where it is possible to quickly supply power.**
- **We have greatly shortened the time required from the planning to the completion of construction of the Chiba Inzai Substation**

Chiba Inzai Substation



4. Addressing increases in renewable energies (Adjustment capability)

<Grid-connected batteries >

- On May 15, 2025, we commenced commercial operation of “Tsumagoi Battery Storage Station” .
(Construction/operation of the Tsumagoi Battery Storage Station is carried out by Tsumagoi Battery Storage Station LLC jointly established by TEPCO and NTT Anode Energy)
- **While contributing to the stabilization of power grids**, this system also allows various data on storage batteries to be collected/managed as well as the examination of the impact on remaining battery life through the use of balancing technology, etc.
- In the future, this system will also enable us to examine how storage batteries can be used to contribute to power grid congestion mitigation as we look to introduce large volumes of renewables.
- The installed capacity of grid-connected batteries will be enlarged upon confirming the performance of the Tsumagoi Battery Storage Station.

Tsumagoi Battery Storage Station



< Battery energy storage system overview >

Commencement of operation	May 15, 2025
Battery energy storage system specifications	Output: 2.0MW /Capacity: 9.3MWh
Battery type	Lithium-ion

4. Addressing increases in renewable energies (Adjustment capability)

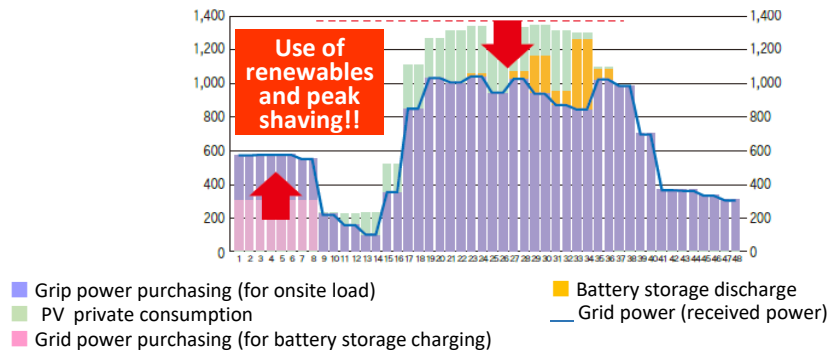
<Battery storage systems/EcoCute>

- On the demand side, leveraging surplus renewable energy and demand peak shaving for “demand equalization initiatives” are important.
- By proposing **battery storage systems mixed with PV power generation** to corporate customers, we can **leverage surplus renewable energy and shave demand peaks**.
- We are trying to encourage household customers that use **EcoCute to heat water during the day (Ohisama EcoCute) instead of at night**.
- As of March 2025, EcoCute achieved cumulative shipments of 10 million units. And, it is expected to expand in the future.

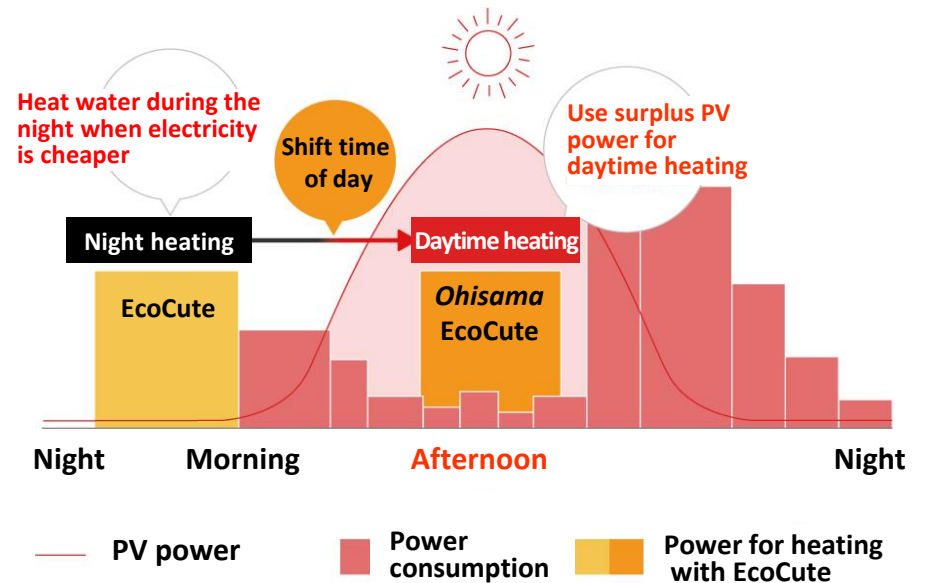
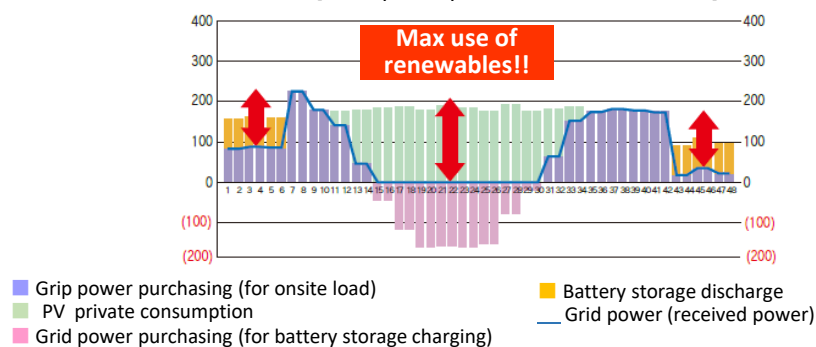
Concept drawing of battery storage systems combined with PV power generation

Ohisama EcoCute diagram

① Normal day operations (factory operation days)
[Example of power use on weekdays]



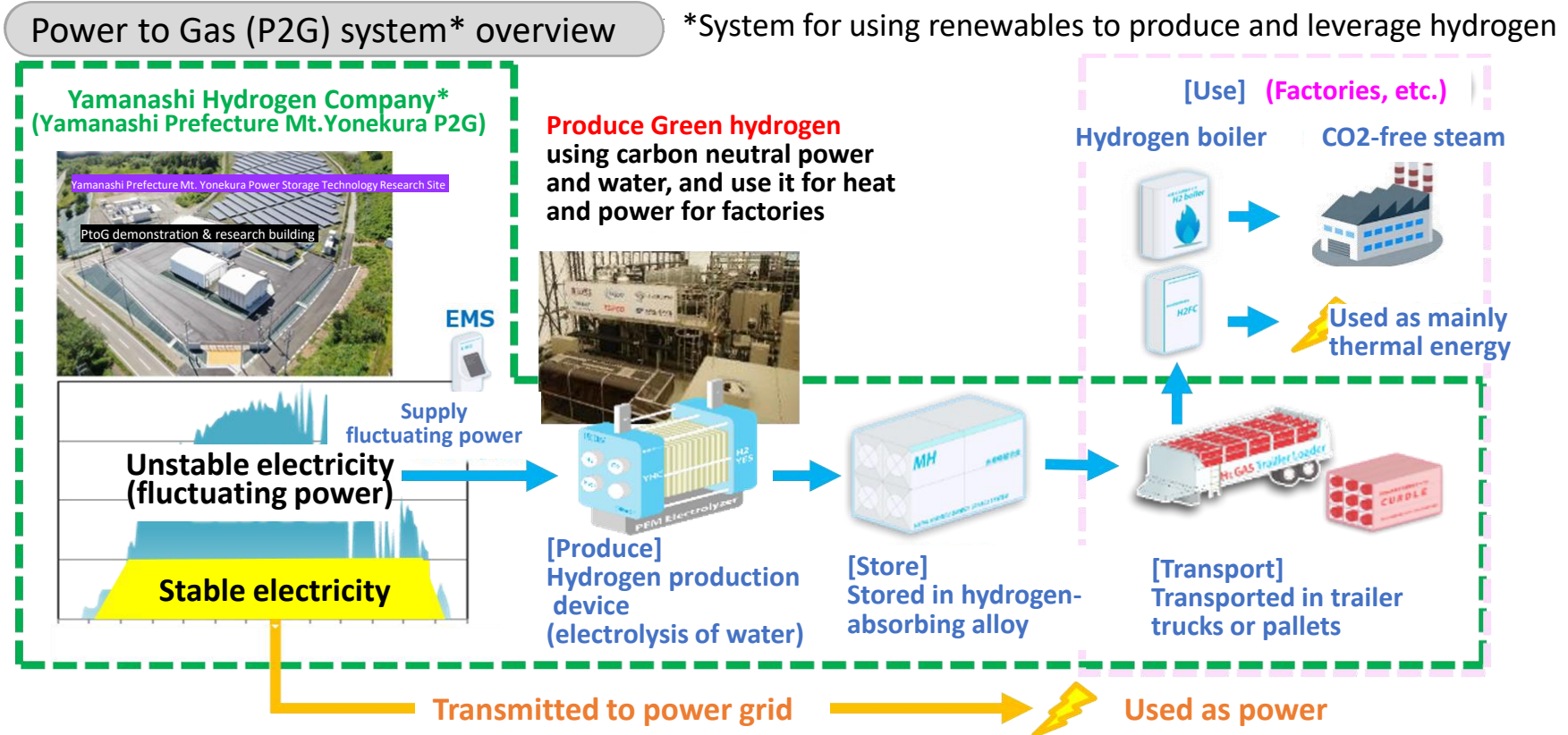
② Normal day operations (weekends and holidays)
[Example of power use on weekends]



4. Addressing increases in renewable energies (Adjustment capability)

<Hydrogen projects>

- On the demand side, mixing hydrogen projects combined with PV power generation, etc., that can contribute to relieving congestion in the electricity system and the increased use of renewables are also important.
- By using decarbonized power sources to produce green hydrogen and leverage it for heat demand at factories, etc., we can contribute to reducing the consumption of fossil fuels.
- In conjunction with this, the demand response effect from producing hydrogen with unstable renewable energy power sources will contribute to relieving congestion in the electricity system and a further increase in the use of renewables.
- TEPCO is currently engaged in hydrogen projects in cooperation with Yamanashi Prefecture, etc. in four locations and plans to expand to more locations.







* Yamanashi Hydrogen Company: Japan's first P2G company. Jointly established by Yamanashi Prefecture, TEPCO, and Toray Industries, Inc.

5. Addressing decarbonized power source needs (Power sources)

<Hydroelectric power (repowering)>

- TEPCO Renewable Power is **repowering (equipment upgrades) aging hydroelectric power stations by replacing old equipment with the latest water turbine generators, etc.** Many of these plants have been in operation for around 100 years, so repowering helps to avoid a decrease in the number of renewable energy power stations due to aging, improve equipment reliability, and increase power output.
- As of the end of FY2024, 27 plants had been repowered and output had been increased by 10 GWh/year. (Compared to FY2018)
- We plan to have repowered 54 plants by FY2030. Our power increase target is 21 GWh/year. (Compared to FY2018)
- We plan to continue with our repowering plans because it guarantees power increases and is very economical.

Main repowering examples

Power Station	Yuzawa (Niigata Prefecture)	Nippashi River (Fukushima Prefecture)	Egusa (Yamanashi Prefecture)	Sawatari (Nagano Prefecture)
Output	15,600 ⇒ 16,100 kW	10,600 ⇒ 11,000 kW	2,400 ⇒ 3,000 kW	4,000 ⇒ 4,500 kW
Commencement of operation	October 2019	Unit 3: February 2021 Unit 1: March 2021 Unit 2: July 2021	February 2024	Unit 2: February 2024 Unit 1: April 2024
Photos				

5. Addressing decarbonized power source needs (Power sources)

<Nuclear>

- It is extremely important for TEPCO to restart the Kashiwazaki-Kariwa Nuclear Power Station as quickly as possible because it would greatly contribute to balancing carbon neutrality in Japan with the stable supply of power.
- Technical preparations for the restart of Unit 7 have been completed, and Unit 6 will be loaded with fuel on 10 June with technical preparations for restart to be completed during the summer.
- TEPCO is doing its utmost to obtain the understanding of the local communities, while also working closely with the national and local governments to improve the effectiveness of evacuation plans and provide as much support as an operator can in the event of an evacuation.

Communication with local residents



■ Communication booths (42 times during FY2024)



■ Power station tours (approximately 7,500 people during FY2024)



■ TEPCO forum (458 participants; December 2024)
*Including satellite venues

Deliberation of how to leverage the strengths of our facilities in the event of a disaster

① Kashiwazaki Resilience Center



Seismically isolated/seismically resistant structure, regional preparedness base

② New head office building (Kashiwazaki office)



Seismically isolated, close to the city office

③ Kashiwazaki-Kariwa Nuclear Power Station Service Hall



Seismically isolated, located on high ground

【 Examples of use during disaster 】

- Can be used to provide lodging as a temporary evacuation center
- Portable toilets can be installed
- Can be used to provide meals



■ Evacuation assistance training

【 Support with the evacuation of people with special needs from social welfare facilities 】

- Number of welfare vehicles: 31
- Personnel: 62
(Personnel needed to transport people with special needs within the PAZ)

5. Addressing decarbonized power source needs (Power sources)


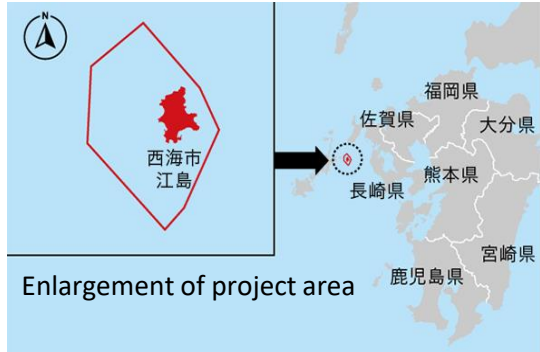
<Nuclear/Off-shore wind>

- We will work to further secure decarbonized power sources over the mid/long-term.
- In regards to the Higashidori Nuclear Power Station, we are making required preparations in the vicinity of the worksite, conducting geological surveys, and deliberating design in order to fulfill the new regulatory requirements.
- We also **continue to work to recommence construction on the Higashidori Nuclear Power Station.**
- Additionally, we are **cooperating with other power operators to get plants back online as quickly as possible in order to provide nuclear power to Eastern Japan regions.**
- Furthermore, in regards to offshore wind power, a consortium made up of TEPCO and Sumitomo Corporation was **selected during the second bidding for domestic offshore wind power projects made by the Japanese Government in December 2023 to be the power operator of an offshore wind farm off the coast of Enoshima in Saikai City, Nagasaki Prefecture.**
- We are engaging in dialogue with the community and moving forward with various surveys and permits with the aim of commencing commercial operation in August 2029.

Planned construction site of the Higashidori Nuclear Power Station



Overview of the offshore wind power project off the coast of Enoshima in Saikai City, Nagasaki Prefecture

Project name	 風と共に奏でる未来 みらいえのしま <small>MIRAI ENOSHIMA</small> MIRAIENOSHIMA LLC (established in March 2024)
Output	420MW (15MW×28units、Made by Vestas)
Date of commercial operation	August 2029
Supply value	¥22.18/kWh
Coverage area	 Enlargement of project area

6. Future direction

- Power demand has fallen as of late, but as noted in the 7th Strategic Energy Plan of the Government of Japan, **future power demand is expected to rise as a result of DX demand from DCs, etc., and to accommodate needs stemming from GX to achieve carbon neutrality, so TEPCO sees this as a large turning point.**
- **It is important for the Japanese economy to accommodate this rise in demand and TEPCO will answer this call in order to contribute to the growth of Japan's economy.**
- Furthermore, many global DCs tend to want **"speedy supply," "stable power," and "decarbonized power sources."**
- To meet these needs, **TEPCO must engage in "A New Way of Doing Business" by which it cooperates with customers while proactively engaging in projects without being constrained by conventional business structures.**
- These initiatives shall be reflected as future growth strategies in our next Comprehensive Special Business Plan.
- **It is through these initiatives that TEPCO will complete its most important mission, which is to fulfill its responsibilities to Fukushima.**