Outlook for Electricity Supply–Demand and Cross-regional Interconnection Lines:

Actual Data for Fiscal Year 2024

November 2025

OCCTO
電力広域的運営推進機関
Organization for Cross-regional Coordination of Transmission Operators,JAPAN

FOREWORD

The Organization for Cross-Regional Coordination of Transmission Operators, Japan (hereinafter, the "Organization") compiles actual data and publishes it as an annual report regarding electric supply and demand and the state of electric systems up to the previous year in compliance with the provisions of Article 181 of the Operational Rules.

The report comprises two part;
[Electricity Supply and Demand]
Data on the actual electricity supply and demand was compiled into separate items, such as peak demand, electric energy requirement, load factor, supply-demand status during the peak and lowest demand periods, and status of electricity during the daily peak demand period. Additionally, data was aggregated on the instructions to improve the supply-demand status issued in accordance with the provision of Paragraph 1 of Article 111 of the Operational Rules and the orders of output curtailment of renewable energy carried out by general transmission and distribution companies (GT&D companies) in accordance with the provisions of Article 174 of the Network Code.

[Network System Utilization]
Regarding the actual performance of network systems, data related to the available transfer capability (ATC), such as data on use, maintenance work, forced outage, and employment of transmission margin of interconnection lines between regions, was collected. In addition, data on the state of congestion on interconnection lines and regional systems was newly prepared because the output control was implemented in conjunction with the congestion mitigation of the regional distribution facilities for the first time in FY 2024.

The Organization published the actual data for electricity supply–demand and network system utilization ahead of the annual report because of the compilation of actual data collection up to the FY 2024.

SUMMARY

This report comprises two parts the electricity supply and demand situation and, the interconnection lines situation.

Regarding supply and demand, the peak demand nationwide (16,084 × 10^4 kW) and the monthly peak electric energy requirement nationwide (83,941 GWh) was both recorded in August.

The reserve margin against the summer and winter peak demands was 9.7% and 11.6%, respectively.

Power exchange instructions were issued by the Organization 34 times, with 5 of them being issued for insufficient ability to reduce power supply caused by unexpected demand decrease and renewable energy output increase.
In Addition, long-cycle frequency control was implemented 314 times in the year.

Instructions for output curtailment of the renewable-energy generating facilities were issued 388 times in FY 2024, increasing from 83 times of issuance in the previous year.

The total volume of utilization of the interconnection lines was 112,876 GWh, which was decreased from the 116,723 GWh in FY 2023.

In FY 2024, 529 interconnection line maintenance events occurred, requiring 1166 days-worth of work.

We hope that this report will be useful.

CONTENTS

Note:
Data for Chapter I include figures at the sending end, i.e., the electricity supplied to the public network system from power plants with energy deducted for station services from FY 2016 beyond. As for the data before FY 2015 which include figures at the generating and receiving end, please see 2016 Annual Report.
https://www.occto.or.jp/en/information_disclosure/annual_report/files/annual_report_FY2016.pdf

CHAPTER I: ACTUAL ELECTRICITY SUPPLY AND DEMAND

1. Regional Service Areas for 10 General Transmission and Distribution (GT&D) Companies and the Definition of a Season

(1) Regional Service Areas for 10 GT&D Companies

A regional service area is a specific area to which a GT&D company supplies electricity through cross-regional interconnection lines. Japan is divided into 10 regional service areas, as depicted in Figure 1-1. The regional service areas served by GT&D companies other than the Okinawa Electric Power Company (EPCO) are connected by cross-regional interconnection lines.

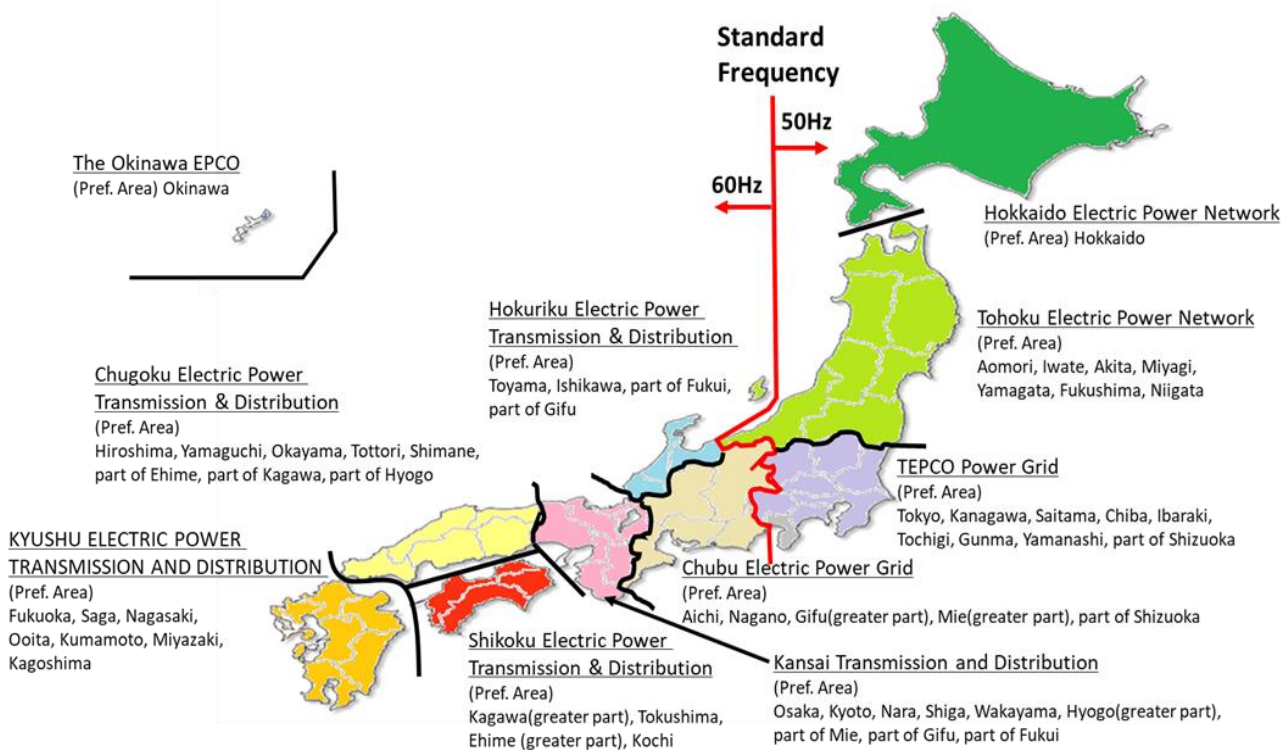

Figure 1-1: The 10 Regional Service Areas in Japan and their Prefectural Distribution

(2) Definition of Seasons

This report divides the seasons into summer and winter. Summer is from July to September, and winter is from December to March. This report compares the outlook of actual weather for the previous year to the Seasonal Highlights on the Climate System prepared by the Japan Meteorological Agency (JMA). JMA defines the summer and winter periods as June–August and December–February, respectively. The definitions of the seasonal period by this report and the JMA differ.

2. Outlook for Actual Weather Nationwide

(1) Weather During the Summer Period (from June to August 2024)

The characteristics of the actual weather from June to August 2024 were published on the website of the JMA. Table 1-1 presents the anomalies in the temperature and precipitation ratios of the period.

- Seasonal mean temperatures were significantly above normal nationwide, because warm air covered nationwide. Seasonal mean temperatures were the highest in western Japan and Okinawa/Amami and tied with 2023 as the highest in eastern Japan on record for summer since 1946. The seasonal anomaly of the average temperature over Japan was +1.76°C (tied with 2023 as the warmest for the season since 1898).
- Seasonal precipitation amounts were significantly above normal on the Pacific side of eastern Japan, and above normal on the Sea of Japan side of northern/western Japan, on the Pacific side of western Japan and in Okinawa/Amami, because the regions were affected by the Baiu-front and typhoons.
- Seasonal sunshine durations were significantly above normal on the Pacific side of eastern/western Japan and on the Sea of Japan side of western Japan, and above normal on the Pacific side of northern Japan and on the Sea of Japan side of eastern Japan, because high-pressure systems frequently covered these regions.

Table 1-1: Anomalies in temperature, precipitation, and sunshine duration by weather region from June to August 2024

Weather Region	Mean Temperature Anomaly[°C]	Precipitation Ratio[%]	Sunshine Duration Ratio[%]
Northern Japan	+2.3	112	108
Eastern Japan	+1.7	137	117
Western Japan	+1.4	114	121
Okinawa/Amami	+0.9	122	104

* Northern Japan contains following prefectures: Hokkaido, Aomori, Iwate, Miyagi, Akita, Yamagata, and Fukushima
* Eastern Japan contains following prefectures: Ibaraki, Tochigi, Gunma, Saitama, Chiba, Tokyo, Kanagawa, Niigata, Toyama, Ishikawa, Fukui, Yamanashi, Naganao, Gifu, Shizuoka, Aichi, and Mie

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Source: Japan Meteorological Agency (JMA), Tokyo Climate Center.
Seasonal Highlights on the Climate System (June – August 2024)
https://ds.data.jma.go.jp/tcc/tcc/products/clisys/season_highlights_pdf/shcs202408.pdf
https://www.data.jma.go.jp/cpd/cgi-bin/view/kikohyo/en.php?kikan=3mon&month=8&year=2024

(2) Weather During the Winter Period (from December 2024 to February 2025)

The characteristics of the actual weather from December 2024 to February 2025 were published on the website of the JMA. Table 1-2 presents the anomalies in temperature and the ratios of rainfall and snowfall during the period.

- Seasonal mean temperatures were significantly below normal in Okinawa/Amami and below normal in western Japan, due to cold air inflow, while those were above normal in northern Japan.
- Seasonal precipitation amounts were significantly below normal on the Pacific side of northern/eastern/western Japan, on the Sea of Japan side of western Japan, and in Okinawa/Amami, due to weak influence of low-pressure systems. Those were the smallest on the Pacific side of eastern/western Japan on record for winter since 1946/47, and tied for the smallest on the Sea of Japan side of western Japan. While those were significantly above normal on the Sea of Japan side of eastern Japan, and above normal on the Sea of Japan side of northern Japan, due to strong winter monsoon. Seasonal snowfall amounts were above normal on the Sea of Japan side of western Japan.
- Seasonal sunshine durations were significantly above normal on the Pacific side of northern/eastern/western Japan and on the Sea of Japan side of western Japan, due to the strong winter monsoon and high-pressure systems that frequently covered the regions. Those were the longest on the Pacific side of eastern Japan on record for winter since 1946/47, and tied for the longest on the Pacific side of northern/western Japan. While those were below normal on the Sea of Japan side in eastern Japan.

Table 1-2: Anomalies in temperature, precipitation, sunshine duration and snowfall by weather region from December 2024 to February 2025

Weather Region	Mean Temperature Anomaly[°C]	Precipitation Ratio[%]	Sunshine Duration Ratio[%]	Snowfall Ratio[%]
Northern Japan	+0.7	83	110	86
Eastern Japan	+0.1	47	112	49
Western Japan	-0.7	47	117	90
Okinawa/Amami	-0.8	66	94	-

* Northern Japan contains following prefectures: Hokkaido, Aomori, Iwate, Miyagi, Akita, Yamagata, and Fukushima
* Eastern Japan contains following prefectures: Ibaraki, Tochigi, Gunma, Saitama, Chiba, Tokyo, Kanagawa, Niigata, Toyama, Ishikawa, Fukui, Yamanashi, Naganao, Gifu, Shizuoka, Aichi, and Mie

Source：Japan Meteorological Agency, Tokyo Climate Center.
Seasonal Highlights on the Climate System (December 2024 – February 2025)
https://ds.data.jma.go.jp/tcc/tcc/products/clisys/season_highlights_pdf/shcs202502.pdf
https://www.data.jma.go.jp/cpd/cgi-bin/view/kikohyo/en.php?kikan=3mon&month=2&year=2025

3. Actual Nationwide Peak Demand

Peak demand refers to the highest consumption of electricity in a given period, and it is expressed hourly in this report.[1] Table 1-3 and Figure 1-2 present the monthly peak demand of each regional service area and of the nation in FY 2024, respectively. Table 1-4 and Figure 1-3 present the nationwide actual annual peak demand from FY 2016 to FY 2024. In Table 1-3, the values in red and blue are the maximum and the minimum monthly peak demand for each regional service area and the nation, respectively.

The nationwide maximum monthly peak demand in FY 2024 was 16,084 × 10^4 kW in August. Monthly peak demand in July and August was almost the same as the values in the previous year (FY 2023). Furthermore, the values in summer (July–September) increased by 716× 10^4 kW or 4.8% from the previous year (FY 2023) because of high temperatures in September.

Table 1-3: Monthly peak demand for regional service areas[2]

[10^4kW]

	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
Hokkaido	384	343	368	439	428	402	360	426	495	505	486	453
Tohoku	991	955	1,083	1,324	1,360	1,273	1,041	1,113	1,338	1,373	1,433	1,273
Tokyo	3,560	3,654	4,606	5,699	5,435	5,390	4,335	4,024	4,469	4,570	4,600	4,837
Chubu	1,764	1,737	1,994	2,473	2,521	2,459	2,051	1,797	2,099	2,371	2,285	2,093
Hokuriku	349	340	397	495	511	490	383	401	479	500	520	449
Kansai	1,770	1,759	2,104	2,707	2,763	2,682	2,139	1,815	2,227	2,507	2,467	2,276
Chugoku	740	697	783	1,019	1,064	1,044	826	800	956	1,034	1,049	899
Shikoku	329	343	395	492	505	485	382	350	413	481	462	401
Kyushu	1,000	1,051	1,247	1,608	1,703	1,643	1,331	1,169	1,334	1,519	1,550	1,353
Okinawa	125	128	154	163	160	152	143	137	93	99	106	100
Nationwide												
FY 2024	10,659	10,757	12,659	16,027	16,084	15,749	12,517	11,496	13,559	14,784	14,631	13,661
FY 2023	10,355	11,074	13,490	16,090	15,992	15,032	11,014	11,756	13,940	14,462	14,018	13,389

[1] In this report, the demand includes connection to the network of the GT&D company and excludes connection to the specified transmission and distribution system or consumption of the privately-owned generating facility.

[2] "Nationwide peak demand" refers the maximum aggregated demand in a given period for the regional service areas of the 10 GT&D companies but not the addition of each regional peak demand.

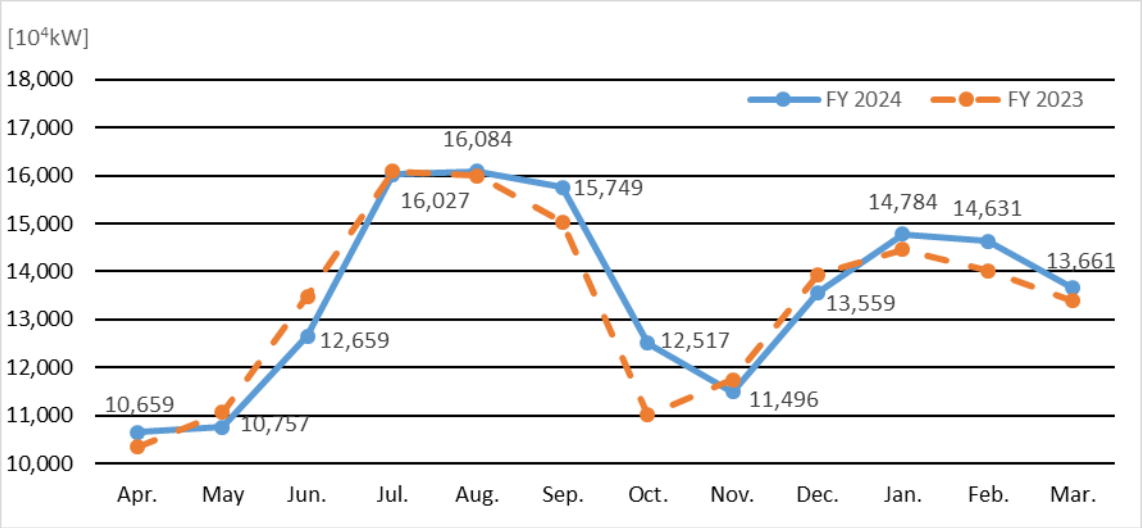

Figure 1-2: Nationwide monthly peak demand

Table 1-4: Actual annual peak demand (FY 2016–2024, sending-end data)

[10^4kW]

FY	2016	2017	2018	2019	2020	2021	2022	2023	2024
Nationwide	15,589	15,577	16,482	16,461	16,645	16,460	16,608	16,090	16,084

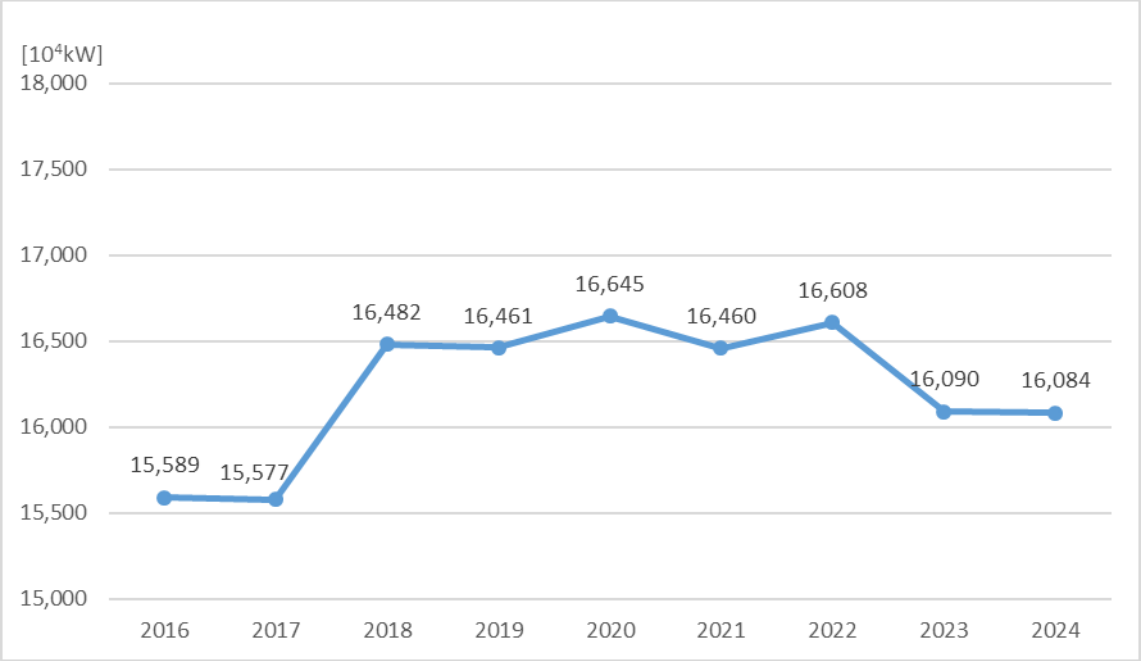

Figure 1-3: Actual annual peak demand (Nationwide)

4. Actual Nationwide Electric Energy Requirements

Table 1-5 presents the monthly electric energy requirements for the regional service areas in FY 2024. Figure 1-4 depicts the nationwide monthly electric energy requirements in FY 2024. Table 1-6 and Figure 1-5 presents the actual annual nationwide electric energy requirements from FY 2016 to FY 2024. In Table 1-5, the values in red and blue are the highest and lowest electric energy requirements for each regional service area and the nation, respectively.

The actual annual nationwide electric energy requirement for FY 2024 was 869,722 GWh, which was higher than that for the previous year (FY 2023) by 7,151 GWh or 0.8% because of the high temperatures in summer.

Table 1-5: Monthly and annual electric energy requirements for the regional service areas[3]

[GWh]

	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Annual
Hokkaido	2,194	2,102	2,063	2,347	2,435	2,164	2,209	2,460	3,082	3,024	2,727	2,766	29,574
Tohoku	5,666	5,663	5,803	6,666	7,013	6,210	5,799	6,187	7,733	7,989	7,472	6,969	79,170
Tokyo	19,360	19,823	21,343	27,966	28,066	24,926	21,050	20,603	24,775	26,033	24,028	23,347	281,321
Chubu	9,246	9,343	9,885	12,512	12,181	11,543	10,010	9,571	11,432	11,989	11,490	10,806	130,007
Hokuriku	2,004	1,928	2,051	2,462	2,472	2,311	2,037	2,119	2,624	2,721	2,704	2,422	27,854
Kansai	9,688	9,809	10,537	13,840	13,922	12,800	10,635	10,094	12,313	13,002	12,550	11,631	140,821
Chugoku	4,083	4,046	4,241	5,361	5,494	5,145	4,327	4,374	5,302	5,577	5,339	4,808	58,097
Shikoku	1,854	1,869	1,958	2,523	2,584	2,344	1,976	1,892	2,310	2,450	2,331	2,132	26,224
Kyushu	5,998	6,108	6,630	8,551	8,815	8,089	6,643	6,339	7,754	8,238	7,770	7,112	88,047
Okinawa	634	680	768	971	959	841	792	648	582	595	552	586	8,609
Nationwide													
FY 2024	60,726	61,372	65,279	83,198	83,941	76,372	65,478	64,287	77,906	81,619	76,963	72,580	869,722
FY 2023	61,201	61,323	65,819	80,760	83,695	75,242	63,288	65,620	76,443	79,735	74,080	75,366	862,572

[3] Monthly electric energy requirement in the table is the aggregation of hourly electric energy requirement.

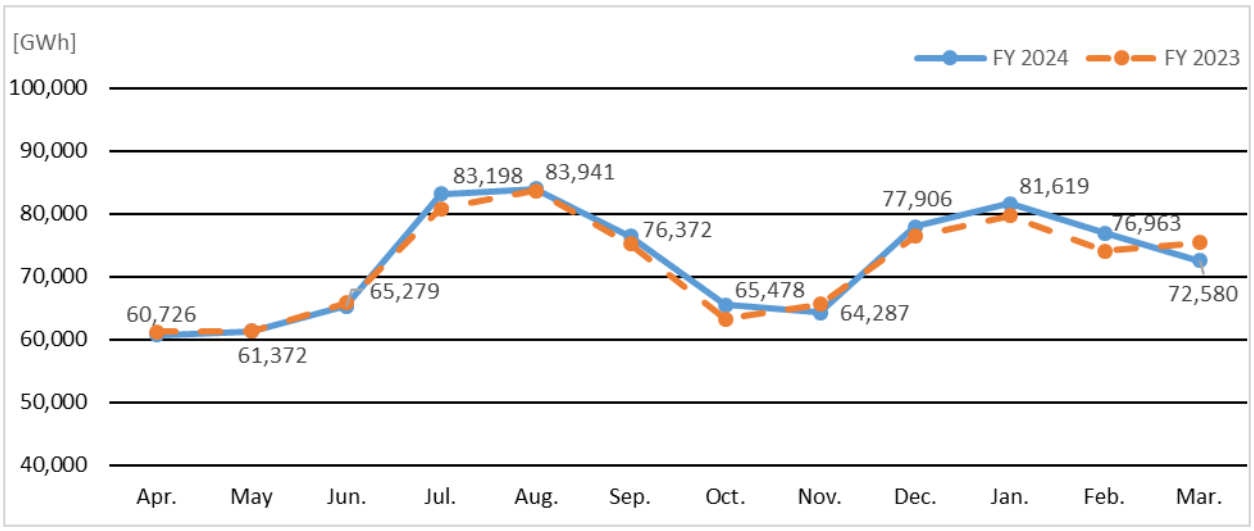

Figure 1-4: Nationwide monthly electric energy requirements

Table 1-6: Actual annual electric energy requirement (FY 2016–2024, sending-end data)

[GWh]

FY	2016	2017	2018	2019	2020	2021	2022	2023	2024
Nationwide	890,451	900,902	896,473	878,383	867,842	885,171	870,849	862,572	869,722

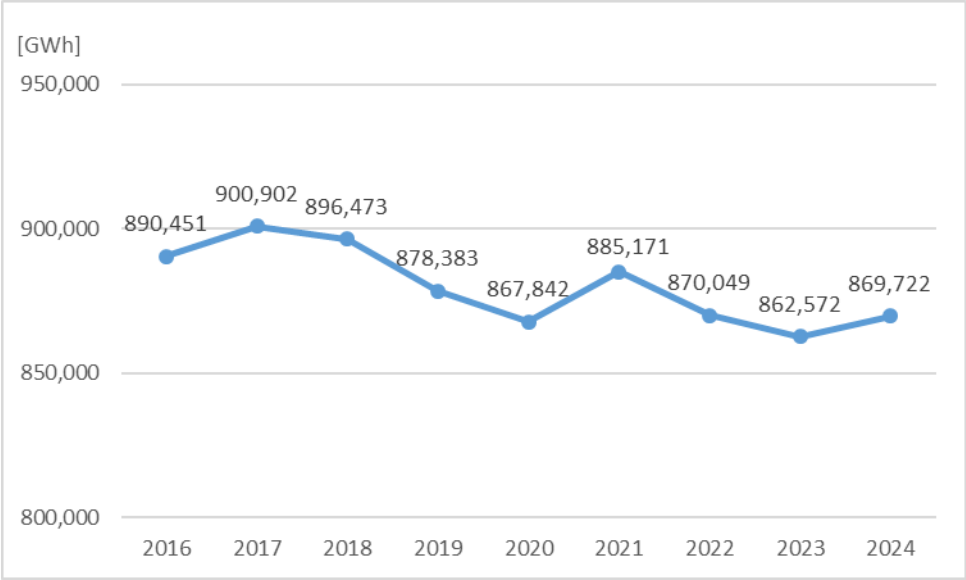

Figure 1-5: Actual annual electric energy requirements (Nationwide)

5. Nationwide Load Factor

The load factor is the ratio of average demand to peak demand for a period.
Table 1-7 presents the monthly and annual load factors for each regional service area in FY 2024, while Figure 1-6 depicts the nationwide monthly load factor. Table 1-8 and Figure 1-7 present the nationwide actual annual load factor from FY 2016 to FY 2024. In Table 1-7, the values in red and blue are the highest and lowest load factors for each regional service area and the nation, respectively.
The nationwide annual load factor for FY 2024 was 61.7%, which was higher than that for the previous year (FY 2023) by 0.7 points but lower by 4.3 points than that for FY 2017 when the highest value was recorded after FY 2016.

Table 1-7: Monthly and annual load factors for the regional service areas[4]

[%]

	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Annual
Hokkaido	79.4	82.5	77.8	71.9	76.5	74.8	82.4	80.2	83.7	80.4	83.4	82.0	66.8
Tohoku	79.4	79.7	74.4	67.7	69.3	67.8	74.9	77.2	77.7	78.2	77.6	73.6	63.1
Tokyo	75.5	72.9	64.4	66.0	69.4	64.2	65.3	71.1	74.5	76.6	77.7	64.9	56.4
Chubu	72.8	72.3	68.8	68.0	64.9	65.2	65.6	74.0	73.2	68.0	74.8	69.4	58.9
Hokuriku	79.7	76.2	71.8	66.9	65.0	65.5	71.4	73.3	73.6	73.1	77.3	72.5	61.1
Kansai	76.0	75.0	69.6	68.7	67.7	66.3	66.8	77.2	74.3	69.7	75.7	68.7	58.2
Chugoku	76.7	78.0	75.3	70.7	69.4	68.4	70.4	76.0	74.5	72.5	75.8	71.9	62.4
Shikoku	78.2	73.2	68.9	68.9	68.8	67.1	69.5	75.0	75.2	68.5	75.1	71.5	59.3
Kyushu	83.3	78.1	73.8	71.5	69.6	68.4	67.1	75.3	78.2	72.9	74.6	70.7	59.0
Okinawa	70.5	71.6	69.3	80.2	80.5	76.9	74.6	65.7	84.1	80.9	77.5	78.7	60.4
Nationwide													
FY 2024	79.1	76.7	71.6	69.8	70.1	67.4	70.3	77.7	77.2	74.2	78.3	71.4	61.7
FY 2023	82.1	74.4	67.8	67.5	70.3	69.5	77.2	77.5	73.7	74.1	75.9	75.7	61.0

[4] "Nationwide load factor" refers to the load factor calculated for all Japan. It is not simply the average of each regional load factor.

$$\text{Monthly Load Factor (\%)} = \frac{\text{Monthly Energy Requirement}}{\text{Monthly Peak Demand} \cdot \text{Calendar Hours (24H} \cdot \text{Monthly Days)}}$$

$$\text{Annual Load Factor (\%)} = \frac{\text{Annual Energy Requirement}}{\text{Annual Peak Demand} \cdot \text{Calendar Hours (24H} \cdot \text{Annual Days)}}$$

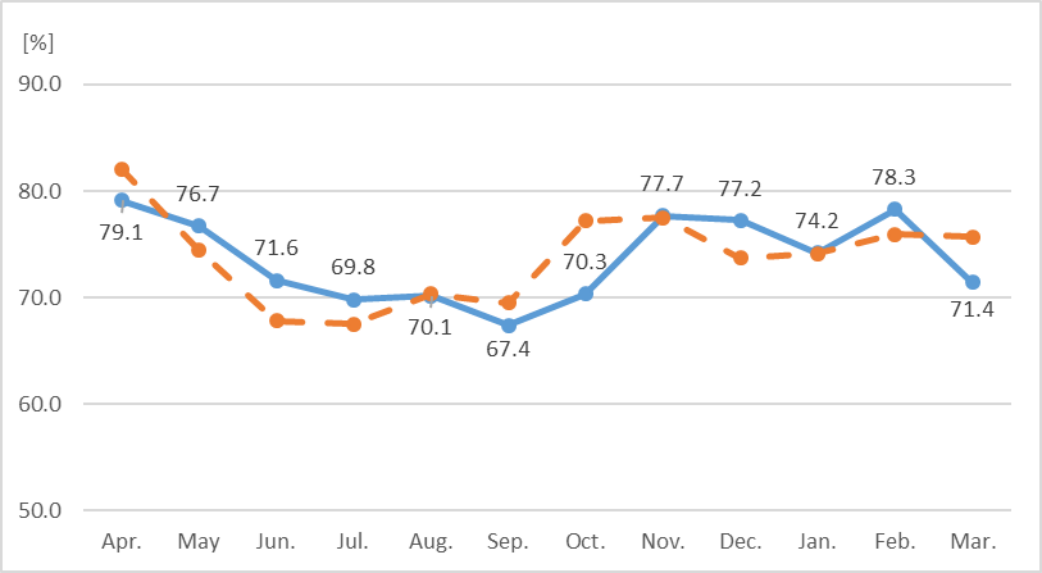

Figure 1-6: Nationwide monthly load factor

Table 1-8: Actual annual load factor (FY 2016–2024)

[%]

FY	2016	2017	2018	2019	2020	2021	2022	2023	2024
Nationwide	65.8	66.0	62.1	60.7	59.5	61.4	59.8	61.0	61.7

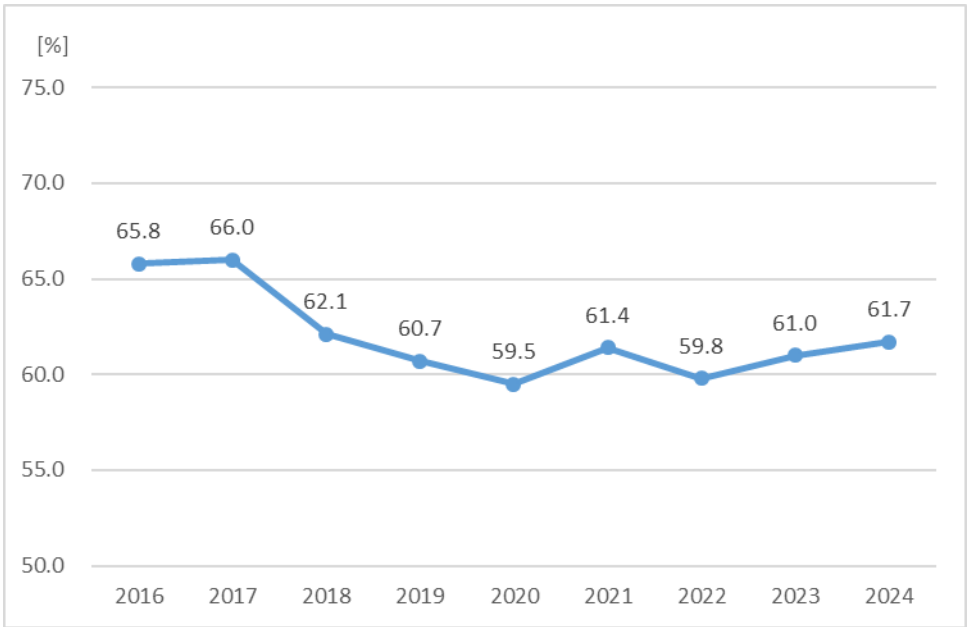

Figure 1-7: Actual annual load factor (Nationwide)

6. Nationwide Supply–Demand Status During the Peak Demand

(1) Nationwide Supply–Demand Status During the Summer Peak Demand Period (July–September)

Table 1-9 presents the supply-demand status during the summer peak demand period for regional service areas in FY 2024. Table 1-10 presents the summer peak supply-demand status data since FY 2016.

The actual nationwide summer peak demand for FY 2024 was 16,084 × 10^4 kW, which was registered at 13:00 to 14:00 on August 5, against the supply capacity of 17,638 × 10^4 kW, with a reserve margin of 9.7%. This was the lowest value since FY 2016.

The least reserve margin for the regional peak demand period in FY 2024 was 4.5%, which was registered at 13:00 to 14:00 on August 23 in the Hokuriku area (the reserve margin of the cross-regional block, including the Hokuriku area for the same period of time. was 9.9%)

Table 1-9: Supply–demand status during the summer peak demand period for nationwide and regional service areas[5] [6] [7]

Area	Peak Demand [10^4kW]	Occurrence Date & Time			Daily Maximum Temperature [℃]	Supply Capacity [10^4kW]	Reserve Capacity [10^4kW]	Reserve Margin [%]	Daily Energy Supply [10^4kWh]	Daily Load Facter [%]
Hokkaido	439	7/23	Tue.	11:00～12:00	31.4	477	39	8.8	8,813	83.7
Tohoku	1,360	8/23	Fri.	14:00～15:00	33.1	1,520	161	11.8	25,789	79.0
Tokyo	5,699	7/29	Mon.	14:00～15:00	37.3	6,233	534	9.4	104,882	76.7
Chubu	2,521	8/5	Mon.	14:00～15:00	39.0	2,723	202	8.0	45,491	75.2
Hokuriku	511	8/23	Fri.	13:00～14:00	39.2	534	23	4.5	9,651	78.7
Kansai	2,763	8/2	Fri.	14:00～15:00	37.8	3,011	248	9.0	51,762	78.1
Chugoku	1,064	8/6	Tue.	14:00～15:00	35.6	1,148	84	7.9	20,413	80.0
Shikoku	505	8/5	Mon.	13:00～14:00	37.3	610	105	20.8	9,324	77.0
Kyushu	1,703	8/5	Mon.	13:00～14:00	35.9	1,967	264	15.5	31,795	77.8
Okinawa	163	7/19	Fri.	14:00～15:00	36.0	202	39	24.1	3,284	84.1
Nationwide	16,084	8/5	Mon.	13:00～14:00	-	17,638	1,552	9.7	300,629	77.9

[5] Figures for temperatures are based on the data provided by the JMA for the cities where the headquarters of the GT&D companies (except for the Okinawa EPCO) of the respective service areas are located. For the regional service area of the Okinawa EPCO, the data for Naha, the prefectural capital of Okinawa, were used instead of data for Urasoe City where the headquarters of Okinawa EPCO is located.

[6] $$\text{Daily Load Factor (\%)} = \frac{\text{Daily Energy Requirement}}{\text{Daily Peak Demand} \times 24\text{H}}$$

"Supply capacity" in the table above refers to the maximum power that can be generated during the peak demand. This capacity is the addition of the installed generating capacity including the deducted portion, such as generator suspension for maintenance work, derating with a decrease in river flow, and unplanned generator outages.

[7] Figures may not match each other because of independent rounding.

Table 1-10: Actual supply–demand status for summer peak demand (FY 2016–2024)[8]

FY	Peak Demand [10^4kW]	Occurrence Date & Time			Daily Maximum Temperature [℃]	Supply Capacity [10^4kW]	Reserve Capacity [10^4kW]	Reserve Margin [%]	Daily Energy Supply [10^4kWh]	Daily Load Facter [%]
2016	15,589	8/9	Tue.	14:00～15:00	-	17,764	2,176	14.0	297,969	79.6
2017	15,550	8/24	Thur.	14:00～15:00	-	17,716	2,165	13.9	300,493	80.5
2018	16,482	8/3	Fri.	14:00～15:00	-	18,749	2,267	13.8	315,434	79.7
2019	16,461	8/2	Fri.	14:00～15:00	-	18,584	2,122	12.9	314,988	79.7
2020	16,645	8/20	Thur.	14:00～15:00	-	18,608	1,964	11.8	310,303	77.7
2021	16,460	8/5	Thur.	13:00～14:00	-	18,804	2,344	14.2	308,249	78.0
2022	16,608	8/2	Tue.	13:00～14:00	-	18,561	1,956	11.8	314,861	79.0
2023	16,090	7/27	Thur.	14:00～15:00	-	18,267	2,177	13.5	299,164	77.5
2024	16,084	8/5	Mon.	13:00～14:00	-	17,638	1,552	9.7	300,629	77.9

[8] See footnote 7.

(2) Nationwide Supply–Demand Status During the Winter Peak Demand Period (December–March)

Table 1-11 presents the supply-demand status during the winter peak demand period for regional service areas in FY 2024. Table 1-12 presents the winter peak supply-demand status data since FY 2016.

The actual nationwide winter peak demand for FY 2024 was 14,784 × 10^4 kW, which was registered at 09:00 to 10:00 on January 10, 2025 against a supply capacity of 16,502× 10^4 kW, with a reserve margin of 11.6%.

The least reserve margin for the regional winter peak demand period was 3.9%, which was registered at 18:00 to 19:00 on February 7, 2025 in the Kyushu area (the reserve margin of the cross-regional block, including the Kyushu area for the same period of time, was 10.9%).

Table 1-11: Supply–demand status during the winter peak demand period for the regional service areas[9],[10],[11]

Area	Peak Demand [10^4kW]	Occurrence Date & Time			Daily Mean Temperature [℃]	Supply Capacity [10^4kW]	Reserve Capacity [10^4kW]	Reserve Margin [%]	Daily Energy Supply [10^4kWh]	Daily Load Facter [%]
Hokkaido	505	1/17	Fri.	08:00～09:00	-4.8	584	79	15.7	11,003	90.7
Tohoku	1,433	2/7	Fri.	09:00～10:00	-1.2	1,664	231	16.1	30,661	89.1
Tokyo	4,837	3/5	Wed.	09:00～10:00	5.3	5,259	422	8.7	95,883	82.6
Chubu	2,371	1/10	Fri.	09:00～10:00	1.4	2,724	353	14.9	46,791	82.2
Hokuriku	520	2/6	Thur.	10:00～11:00	-0.3	599	79	15.2	11,195	89.6
Kansai	2,507	1/10	Fri.	09:00～10:00	3.1	2,637	129	5.2	50,697	84.2
Chugoku	1,049	2/6	Thur.	08:00～09:00	0.9	1,146	97	9.3	22,067	87.7
Shikoku	481	1/10	Fri.	09:00～10:00	2.7	549	68	14.1	9,588	83.1
Kyushu	1,550	2/7	Fri.	18:00～19:00	2.2	1,611	61	3.9	32,807	88.2
Okinawa	106	2/7	Fri.	19:00～20:00	12.2	162	56	52.9	2,170	85.3
Nationwide	14,784	1/10	Fri.	09:00～10:00	-	16,502	1,716	11.6	306,014	86.2

[9] See footnote 5.
[10] See footnote 6.
[11] See footnote 7.

Table 1-12: Actual supply–demand status for winter peak demand (FY 2016–2024)[12]

FY	Peak Demand [10^4kW]	Occurrence Date & Time			Daily Mean Temperature [℃]	Supply Capacity [10^4kW]	Reserve Capacity [10^4kW]	Reserve Margin [%]	Daily Energy Supply [10^4kWh]	Daily Load Facter [%]
2016	14,914	1/24	Tue.	18:00～19:00	-	16,354	1,440	9.7	314,968	88.0
2017	15,577	1/25	Thur.	18:00～19:00	-	16,915	1,339	8.6	330,605	88.4
2018	14,603	1/10	Thur.	09:00～10:00	-	16,104	1,501	10.3	308,436	88.0
2019	14,619	2/7	Fri.	09:00～10:00	-	16,808	2,189	15.0	303,347	86.5
2020	15,607	1/8	Fri.	09:00～10:00	-	17,012	1,406	9.0	329,833	88.1
2021	15,119	1/14	Fri.	09:00～10:00	-	16,783	1,665	11.0	317,617	87.5
2022	15,967	1/25	Wed.	09:00～10:00	-	17,587	1,620	10.1	332,978	86.9
2023	14,462	1/24	Wed.	09:00～10:00	-	16,527	2,065	14.3	304,378	87.7
2024	14,784	1/10	Fri.	09:00～10:00	-	16,502	1,716	11.6	306,014	86.2

[12] See footnote 7.

7. Supply–Demand Status During the Actual Least Cross-regiional Reserve Margin Period

The cross-regional reserve margin refers to a reserve margin after leveling out the reserve margins calculated for the respective areas within the transfer capacity of interconnection lines. For the calculation, the supply capacity of a certain area is transferred to the adjacent areas until their reserve margins become the same level within the volume of the available transfer capacity (ATC) of the interconnection lines. If the ATC of an interconnection line becomes zero and the constraint of the line emerges during the transfer of the supply capacity to the adjacent areas, the cross-regional reserve margin becomes different from the adjacent areas.

The Organization started publishing the cross-regional reserve margin on the cross-regional organization system and the cross-regional reserve margin Web publishing system on March 24, 2022.[13]

Tables 1-13 and 1-14 present the supply–demand status during occurrences at the actual least cross-reserve margin,[14] and the cross-reserve margin of 3% during the summer and winter peak periods, respectively. Moreover, no case was under 3% of the cross-reserve margin.

Table 1-13 Supply–demand status during occurrences at the actual least cross-regional reserve margin in the summer peak period

FY	Occurrence Date & Time		Block	Block			Cross-regional Reserve Margin(%)
				Demand(MW)	Supply capacity(MW)	Reserve capacity(MW)	
2022	2022/7/1	9:00~9:30	Tokyo	50,346	51,776	1,430	2.84
2023	2023/7/19	11:30~12:00	Tokyo	51,842	54,998	3,156	6.09
2024	2024/7/8	9:00~9:30	Tokyo	50,162	51,763	1,601	3.19

Table 1-14 Supply–demand status during occurrences at the actual least cross-regional reserve margin in the winter peak period

FY	Occurrence Date & Time		Block	Block			Cross-regional Reserve Margin(%)
				Demand(MW)	Supply capacity(MW)	Reserve capacity(MW)	
2022	2022/12/12	1:30~2:00	Hokkaido	3,972	4,167	195	4.91
2023	2024/3/19	0:00~0:30	Hokkaido	3,772	4,030	258	6.84
2024	2024/12/6	12:30~13:00	Hokkaido	4,351	4,647	296	6.80

[13] https://web-kohyo.occto.or.jp/kks-web-public/ (written only in Japanese); Unit is shown in MW, similar to website.

[14] The actual least cross-regional reserve margin refers to the figure of gate closure (one hour before actual supply–demand) and not the actual supply–demand figure.

8. Nationwide Lowest Demand Period

Table 1-15 presents the status during the lowest demand period in FY 2024. Meanwhile, Table 1-16 and Figure 1-8 present the nationwide actual annual lowest demand from FY 2016 to 2024.

The lowest demand in FY 2024 was 5,929 × 10^4 kW, which was the lowest since FY 2016, and it is lower than that of the previous year (FY 2023) by 15 × 10^4 kW or 0.3% and lower than the highest demand in FY 2016 by 587× 104 kW or 9.0%.

Table 1-15: Lowest demand period for the nationwide and regional service areas[15]

Area	Least Demand [10^4kW]	Occurrence Date & Time			Daily Mean Temperature [℃]	Daily Energy Supply [10^4kWh]
Hokkaido	222	9/23	Mon.	01:00～02:00	14.8	6,355
Tohoku	561	5/5	Sun.	01:00～02:00	19.5	15,395
Tokyo	1,855	5/5	Sun.	06:00～07:00	21.5	54,143
Chubu	815	5/3	Fri.	01:00～02:00	19.1	22,508
Hokuriku	174	5/5	Sun.	00:00～01:00	22.4	4,807
Kansai	938	5/5	Sun.	01:00～02:00	20.7	26,320
Chugoku	408	5/5	Sun.	01:00～02:00	20.4	10,909
Shikoku	182	1/1	Wed.	14:00～15:00	7.2	5,995
Kyushu	615	5/5	Sun.	07:00～08:00	22.7	16,694
Okinawa	61	2/17	Mon.	01:00～02:00	17.4	1,827
Nationwide						
FY 2024	5,929	5/5	Sun.	01:00～02:00	-	164,619
FY 2023	5,944	5/5	Fri.	01:00～02:00	-	165,990

Table 1-16: Actual annual lowest demand (FY 2016–2024, sending-end data)

[10^4kW]

FY	2016	2017	2018	2019	2020	2021	2022	2023	2024
Nationwide	6,516	6,477	6,496	6,398	6,065	6,332	6,239	5,944	5,929

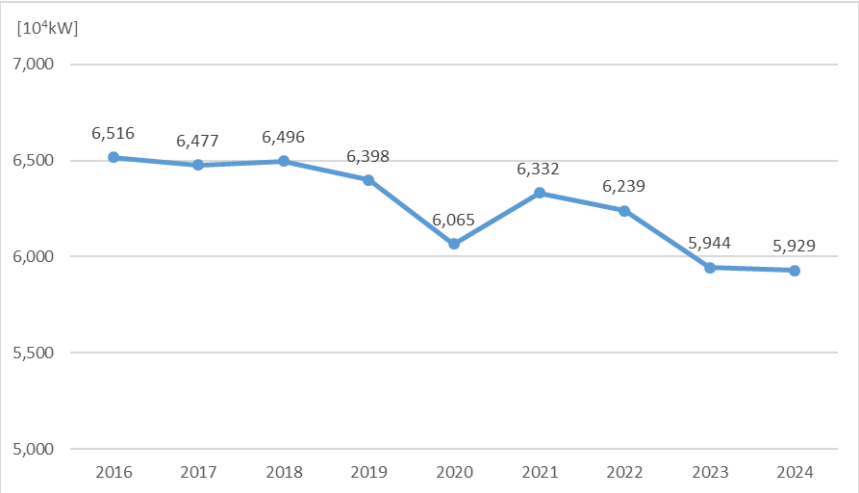

Figure 1-8: Actual annual lowest demand (Nationwide)

[15] See Footnote 5.

9. Nationwide Peak Daily Energy Supply

(1) Status during the peak daily energy requirement period in summer (July–September)

Table 1-17 presents the peak daily energy requirement in summer (July–September) in FY 2024.[16]

Table 1-17: Summer peak daily energy supply for the nationwide and regional service areas

Area	Peak Daily Energy Supply [10^4kWh]	Occurrence Date		Daily Mean Temperature [˚C]
Hokkaido	8,813	7/23	Tue.	28.1
Tohoku	25,789	8/23	Fri.	28.1
Tokyo	104,882	7/29	Mon.	32.3
Chubu	46,802	7/23	Tue.	32.4
Hokuriku	9,651	8/23	Fri.	32.9
Kansai	51,762	8/2	Fri.	32.2
Chugoku	20,413	8/6	Tue.	31.2
Shikoku	9,481	8/2	Fri.	32.2
Kyushu	32,326	8/2	Fri.	32.1
Okinawa	3,292	7/22	Mon.	30.8
Nationwide				
FY 2024	304,703	7/23	Tue.	-
FY 2023	300,714	8/4	Fri.	-

(2) Status during the peak daily energy requirement period in winter (December–March)

Table 1-18 presents the peak daily energy requirement in winter (December 2024 to March 2025) in FY 2024.

Table 1-18: Winter peak daily energy supply for the nationwide and regional service areas

Area	Peak Daily Energy Supply [10^4kWh]	Occurrence Date		Daily Mean Temperature [˚C]
Hokkaido	11,003	1/17	Fri.	-4.8
Tohoku	30,661	2/7	Fri.	-1.2
Tokyo	97,750	3/4	Tue.	2.4
Chubu	47,330	2/6	Thur.	1.9
Hokuriku	11,329	2/5	Wed.	-0.8
Kansai	51,219	2/5	Wed.	1.7
Chugoku	22,438	2/7	Fri.	0.0
Shikoku	9,792	2/5	Wed.	1.3
Kyushu	32,807	2/7	Fri.	2.2
Okinawa	2,202	2/8	Sat.	11.4
Nationwide				
FY 2024	311,064	2/5	Wed.	-
FY 2023	304,378	1/24	Wed.	-

[16] See Footnote 5.

10. Instructions to Exchange Power Issued and Long-Cycle Cross-Regional Frequency Controls Implemented by the Organization

(1) Power Exchange Instructions

According to the provisions of Paragraph 1 of Article 111 of the Operational Rules, the Organization may issue an instruction to members (EPCOs) in order to improve the electricity supply-demand status if the status of electricity supply-demand has worsened or is likely to worsen.

In FY 2024, the Organization issued instructions to GT&D companies on thirty-four occasions for them to exchange power as shown in Table 1-19. Specifically, the instructions to compensate electric power between areas was issued on twenty-nine occasions in total because of the shortage of supply capacity, and the instructions to send electric power from the Kansai area was issued on five occasions in total because of insufficient ability of reducing power supply continuously from the previous fiscal year (for details on these instructions, please see the "Details of Actual Instructions Issued by the Organization" at the end of the report). [17]

In September when temperatures as high as those typically seen in August were recorded, the number of instructions issued because of the shortage of supply capacity was second highest in the past decade (FY 2015 to FY 2024) due to the increase in demand exceeding forecast.

[17] https://www.occto.or.jp/oshirase/shiji/2024.html (in Japanese only)

Table 1-19: Actual instructions to GT&D companies due to insufficient supply capacity

Date	Received Area	Issuance	Maximum Transferred Capacity [10^4 kW]	Background of Issuance
Jun. 11	Tohoku	1	30	Demand growth due to high temperature more than forecasted
Jun. 12	Tohoku	2	30	Demand growth due to high temperature more than forecasted, Supply capacity shortage due to decreased output from solar and wind power generation
Jun. 13	Tohoku	2	55	Demand growth due to high temperature more than forecasted
Jun. 21	Tohoku	2	85	Supply capacity shortage due to decreased output from solar generation
Jul. 5	Kansai	2	138	Demand growth more than forecasted, Supply capacity shortage due to maintenance schedule change of regulating generator
Jul. 8	Tokyo	1	20	Demand growth due to high temperature more than forecasted
Jul. 8	Kansai	1	36	Demand growth due to high temperature more than forecasted
Aug. 21	Kyushu	1	35	Supply capacity shortage due to generator shutdown
Aug. 23	Tohoku	1	25	Demand growth due to high temperature more than forecasted
Aug. 26	Kansai	3	111	Demand growth due to high temperature more than forecasted, Supply capacity shortage due to generator shutdown
Sep. 11	Tokyo	1	30	Demand growth due to high temperature more than forecasted
Sep. 11	Tohoku	1	45	Demand growth due to high temperature more than forecasted
Sep. 12	Tokyo	1	50	Demand growth due to high temperature more than forecasted
Sep. 12	Kansai	1	42	Demand growth due to high temperature more than forecasted
Sep. 17	Kansai	2	69	Demand growth due to high temperature more than forecasted
Sep. 18	Kansai	1	141	Demand growth due to high temperature more than forecasted
Sep. 19	Kansai	1	87	Demand growth due to high temperature more than forecasted
Sep. 19	Chubu	1	30	Supply capacity shortage due to decreased output from solar generation
Sep. 20	Kansai	1	21	Demand growth due to high temperature more than forecasted
Oct. 2	Tohoku	1	55	Demand growth due to high temperature more than forecasted
Oct. 17	Kyushu	1	95	Demand growth due to high temperature more than forecasted, Supply capacity shortage due to decreased output from solar generation
Mar. 15	Hokuriku	1	16	Demand growth due to bad weather more than forecasted, Supply capacity shortage due to decreased output from solar generation

Table 1-20: Actual instructions to GT&D companies due to insufficient ability of reducing power supply

Date	Sent Area	Issuance	Maximum Transferred Capacity [10^4 kW]	Background of Issuance
Jun. 1	Kansai	2	73.9	Lower demand more than forecasted, Higher output from renewable energy generation
Jun. 2	Kansai	2	71.8	Lower demand more than forecasted, Higher output from renewable energy generation
Nov. 3	Kansai	1	7.8	Lower demand more than forecasted, Higher output from renewable energy generation

* As for the instruction on November 3, the exchange of power for the actual supply-demand was avoided as a result of fluctuations in the supply-demand status.

Table 1-21: Actual instructions to GT&D companies issued by the Organization (FY 2015–2024)

[Instructions]

FY	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Insufficient supply capacity	2	2	10	25	6	226	21	24	3	29
Insufficient ability of reducing power supply	–	–	–	–	–	–	–	–	5	5

(2) Long-cycle Cross-Regional Frequency Controls

In accordance with the provisions of Article 132 of the Operational Rules, in order to control the shortage of balancing capacity for redundancy[18] due to the increase in renewable energy, long-cycle cross-regional frequency controls[19] for which the Organization mediates between the GT&D companies one day before the actual supply-demand date were implemented on 314 occasions in total in FY 2024. In FY 2024, in addition to the Hokkaido, Tohoku, Chubu, Hokuriku, Chugoku, Shikoku, and Kyushu areas, surplus electric power in the Kansai area was also subject to the controls for the first time. The number of controls implemented in FY 2024 decreased by 63 times from 377 times in FY 2023, since cases of failed mediation have increased because of the lack of areas with room to receive surplus electric power compared to the number of requests for long-cycle cross-regional frequency controls because of the nationwide expansion of the installation of renewable energy generating facilities.

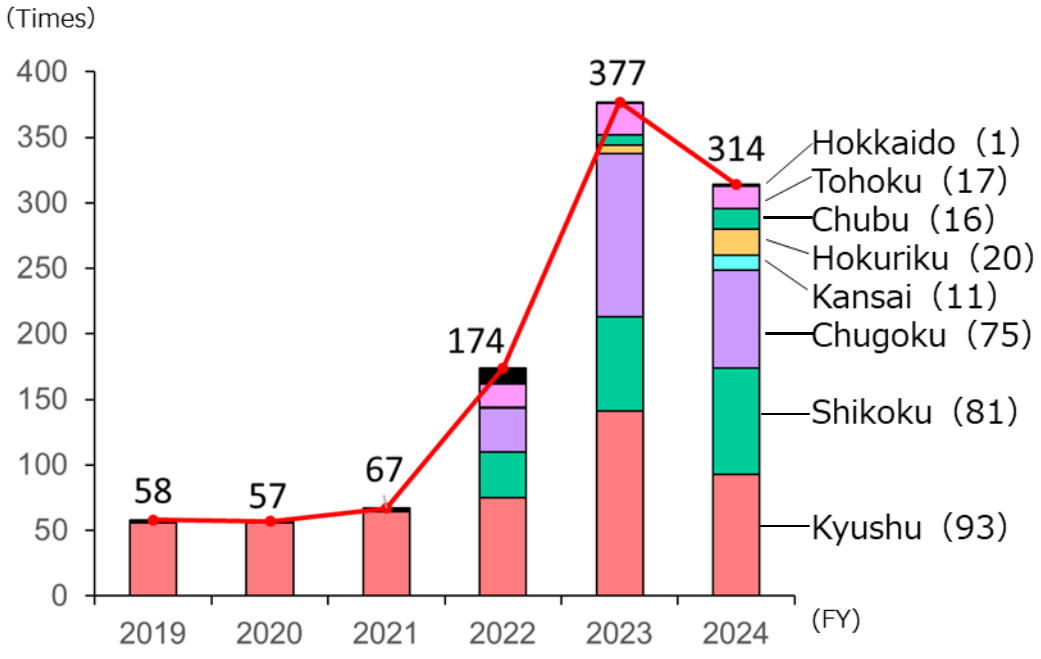

Figure 1-9: Transition of Long-cycle Cross-regional Frequency Controls

[18] This refers to frequency control through the utilization of the balancing capacity of other regional service areas of member GT&D companies via interconnection lines. This is used when the balancing capacity for redundancy becomes or might become insufficient in a regional service area.

[19] This refers to the ability to decrease the power supply from generators, such as thermal power generators. The output of renewable energy can fluctuate over a short period. Thus, controlling the output of the thermal power generators according to such fluctuations is essential. Among such output controls, the capacity to vary the output of the generators is generally called the "balancing capacity for redundancy."

11. Output Curtailment of Renewable Energy Generating Facilities Implemented by GT&D Companies

GT&D companies may issue orders to curtail the output of renewable energy (output curtailment through constraints on supply-demand balance) according to the provisions of Article 174 of the Network Code in cases where the electricity supply is expected to exceed demand even after the curtailment of the output from sources other than renewable energy.

Tables 1-22 to 1-30 present the maximum and the actual output curtailment of the renewable energy generating facilities (variable renewable energy sources) based on the orders for output curtailment in FY 2024 in the Hokkaido, Tohoku, Chubu, Hokuriku, Kansai, Chugoku, Shikoku, Kyushu, and Okinawa areas where output curtailment was actually implemented. Output curtailment was implemented because the balancing capacity for redundancy was expected to become insufficient.

Output curtailment was implemented 388 times in FY 2024, which was an increase of 83 times from the FY 2023 due to the nationwide increase of connectable capacity of renewable energy generating facilities (variable renewable energy sources).

The Organization confirms the output curtailment of the renewable energy generating facilities (variable renewable energy sources) implemented by the respective GT&D companies and verifies whether the issued orders for output curtailment were appropriate according to the provisions of Paragraph 1 of Article 180 of the Operational Rules. [20]

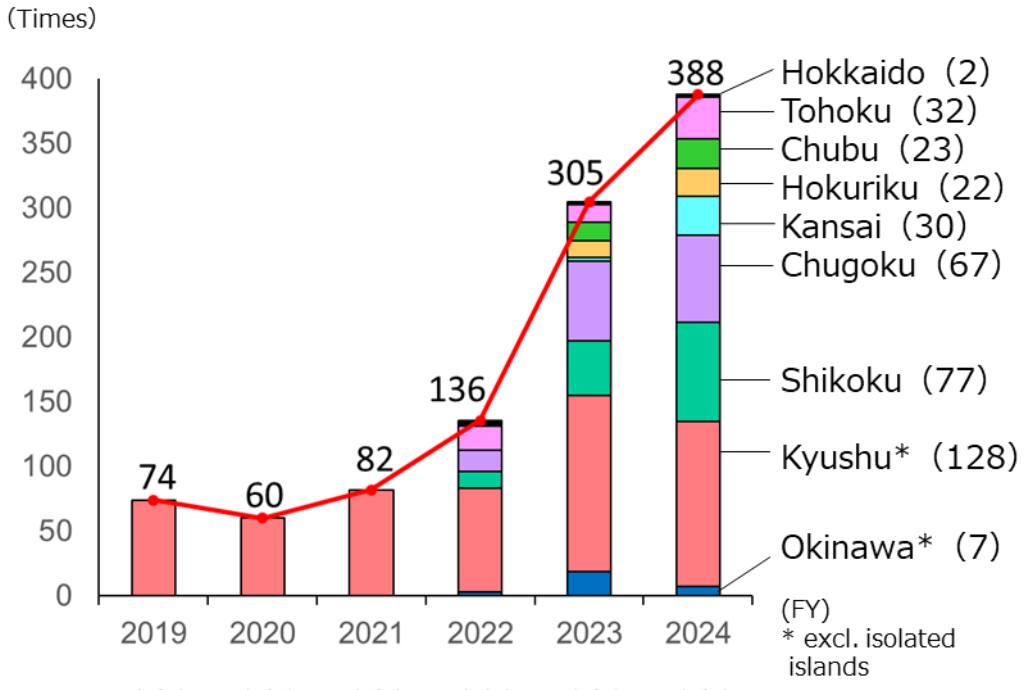

Figure 1-10: Transition of the Annual Output Curtailment of Renewable Energy Sources

[20] http://www.occto.or.jp/oshirase/shutsuryokuyokusei/index.html (in Japanese only).

Table 1-22: Actual output curtailment of the renewable energy generating facilities (Hokkaido, times, 10^4 kW)

Hokkaido			
Month	Numbers of curtailment [times]	Maximum curtailed capacty [10^4kW]	Implemented on
Apr. 2024	1	39.8	Apr. 14
May 2024	1	31.3	May 5
Jun. 2024	0		
Jul. 2024	0		
Aug. 2024	0		
Sep. 2024	0		
Oct. 2024	0		
Nov. 2024	0		
Dec. 2024	0		
Jan. 2025	0		
Feb. 2025	0		
Mar. 2025	0		
FY 2024 total	2		

Table 1-23: Actual output curtailment of the renewable energy generating facilities (Tohoku, times, 10^4 kW)

Tohoku			
Month	Numbers of curtailment [times]	Maximum curtailed capacty [10^4kW]	Implemented on
Apr. 2024	12	284.1	Apr. 28
May 2024	9	294.2	May 3
Jun. 2024	1	96.0	Jun. 8
Jul. 2024	0	0.0	
Aug. 2024	0	0.0	
Sep. 2024	0	0.0	
Oct. 2024	2	74.2	Oct. 13
Nov. 2024	2	93.8	Nov. 3
Dec. 2024	0	0.0	
Jan. 2025	0	0.0	
Feb. 2025	0	0.0	
Mar. 2025	6	346.2	Mar. 23
FY 2024 total	32		

Table 1-24: Actual output curtailment of the renewable energy generating facilities (Chubu, times, 10^4 kW)

Chubu			
Month	Numbers of curtailment [times]	Maximum curtailed capacty [10^4kW]	Implemented on
Apr. 2024	6	91.1	Apr. 7
May 2024	8	191.0	May 5
Jun. 2024	1	119.8	Jun. 1
Jul. 2024	0	0.0	
Aug. 2024	0	0.0	
Sep. 2024	1	15.4	Sep. 1
Oct. 2024	2	40.9	Oct. 13
Nov. 2024	2	183.6	Nov. 3
Dec. 2024	0	0.0	
Jan. 2025	0	0.0	
Feb. 2025	1	12.2	Feb. 16
Mar. 2025	2	32.7	Mar. 30
FY 2024 total	23		

Table 1-25: Actual output curtailment of the renewable energy generating facilities (Hokuriku, times, 10^4 kW)

Hokuriku			
Month	Numbers of curtailment [times]	Maximum curtailed capacty [10^4kW]	Implemented on
Apr. 2024	11	30.6	Apr. 7
May 2024	5	35.7	May 4
Jun. 2024	2	9.0	Jun. 1
Jul. 2024	1	9.3	Jul. 7
Aug. 2024	0	0.0	
Sep. 2024	0	0.0	
Oct. 2024	1	4.5	Oct. 13
Nov. 2024	1	4.2	Nov. 3
Dec. 2024	0	0.0	
Jan. 2025	0	0.0	
Feb. 2025	0	0.0	
Mar. 2025	1	10.9	Mar. 23
FY 2024 total	22		

Table 1-26: Actual output curtailment of the renewable energy generating facilities (Kansai, times, 10^4 kW)

Kansai			
Month	Numbers of curtailment [times]	Maximum curtailed capacty [10^4kW]	Implemented on
Apr. 2024	6	247.8	Apr. 14
May 2024	10	265.1	May 25
Jun. 2024	4	260.5	Jun. 1
Jul. 2024	0	0.0	
Aug. 2024	0	0.0	
Sep. 2024	0	0.0	
Oct. 2024	3	225.9	Oct. 13
Nov. 2024	1	165.7	Nov. 3
Dec. 2024	0	0.0	
Jan. 2025	0	0.0	
Feb. 2025	0	0.0	
Mar. 2025	6	201.8	Mar. 23
FY 2024 total	30		

Table 1-27: Actual output curtailment of the renewable energy generating facilities (Chugoku, times, 10^4kW)

Chugoku			
Month	Numbers of curtailment [times]	Maximum curtailed capacty [10^4kW]	Implemented on
Apr. 2024	16	225.2	Apr. 14
May 2024	16	169.9	May 3
Jun. 2024	11	177.9	Jun. 1
Jul. 2024	1	52.1	Jul. 7
Aug. 2024	0	0.0	
Sep. 2024	0	0.0	
Oct. 2024	6	109.6	Oct. 13
Nov. 2024	4	146.0	Nov. 3
Dec. 2024	1	73.7	Dec. 1
Jan. 2025	1	37.6	Jan. 19
Feb. 2025	1	52.9	Feb. 27
Mar. 2025	10	185.0	Mar. 23
FY 2024 total	67		

Table 1-28: Actual output curtailment of the renewable energy generating facilities (Shikoku, times, 10^4 kW)

Shikoku			
Month	Numbers of curtailment [times]	Maximum curtailed capacty [10^4kW]	Implemented on
Apr. 2024	9	122.7	Apr. 14
May 2024	18	127.3	May 4
Jun. 2024	3	86.8	Jun. 1
Jul. 2024	0	0.0	
Aug. 2024	0	0.0	
Sep. 2024	0	0.0	
Oct. 2024	3	40.0	Oct. 13
Nov. 2024	17	96.2	Nov. 10
Dec. 2024	0	0.0	
Jan. 2025	6	43.0	Jan. 25
Feb. 2025	2	20.1	Feb. 27
Mar. 2025	19	132.0	Mar. 26
FY 2024 total	77		

Table 1-29: Actual output curtailment of the renewable energy generating facilities (Kyushu, times, 10^4 kW)

Kyushu			
Month	Numbers of curtailment [times]	Maximum curtailed capacty [10^4kW]	Implemented on
Apr. 2024	15	411.0	Apr. 14
May 2024	21	379.0	May 3
Jun. 2024	11	189.0	Jun. 1
Jul. 2024	0	0.0	
Aug. 2024	0	0.0	
Sep. 2024	5	66.0	Sep. 24
Oct. 2024	9	307.0	Oct. 13
Nov. 2024	15	354.2	Nov. 3
Dec. 2024	10	249.0	Dec. 1
Jan. 2025	10	373.7	Jan. 1
Feb. 2025	14	186.0	Feb. 14
Mar. 2025	18	573.5	Mar. 23
FY 2024 total	128		

Table 1-30: Actual output curtailment of the renewable energy generating facilities (Okinawa, times, 10^4 kW)

Okinawa			
Month	Numbers of curtailment [times]	Maximum curtailed capacty [10^4kW]	Implemented on
Apr. 2024	0	0.0	
May 2024	0	0.0	
Jun. 2024	0	0.0	
Jul. 2024	0	0.0	
Aug. 2024	0	0.0	
Sep. 2024	0	0.0	
Oct. 2024	0	0.0	
Nov. 2024	0	0.0	
Dec. 2024	0	0.0	
Jan. 2025	1	1.5	Jan. 1
Feb. 2025	0	0.0	
Mar. 2025	6	6.1	Mar. 23
FY 2024 total	7		

CHAPTER II: ACTUAL UTILIZATION OF CROSS-REGIONAL INTERCONNECTION LINES

1. Cross-Regional Interconnection Lines and their Management

(1) Cross-Regional Interconnection Lines

Cross-regional interconnection lines (hereinafter "interconnection lines") represent AC transmission lines of 250 kV or more, DC transmission lines of 200 kV or more, and AC/DC converters that regularly connect the regional service areas of GT&D companies. These interconnection lines make the electric power supply beyond the respective service areas available. The Organization issues directions to supply electricity through the interconnection lines and secures supply-demand balance in case of insufficient supply capacity for each regional service area. Figure 2-1 and Table 2-1 present the summary of interconnection lines.

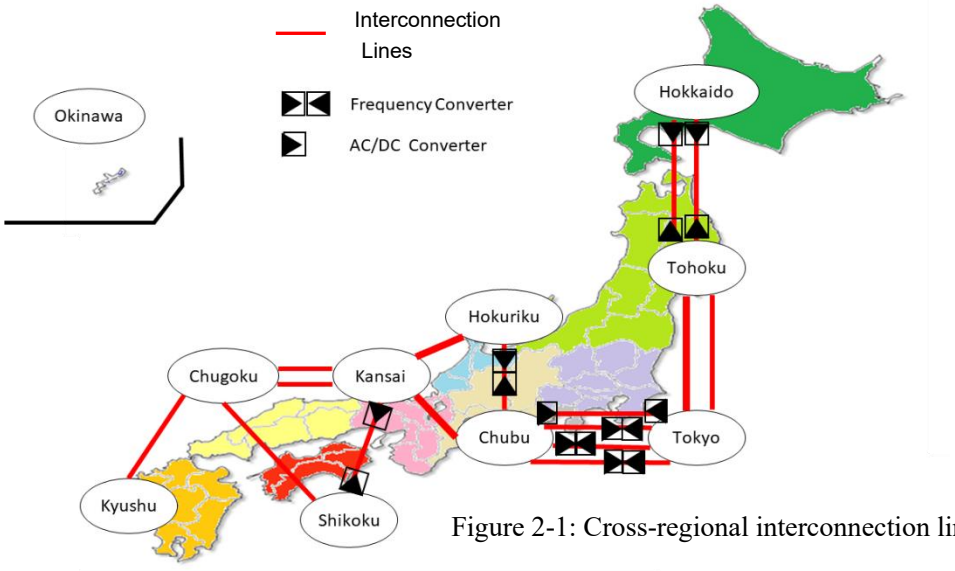

Figure 2-1: Cross-regional interconnection lines in Japan

Table 2-1: Summary of cross-regional interconnection lines (at the end of FY 2024)

Interconnection Lines	Areas・Directions				Corresponding Facilities	AC/DC
Interconnection facilities between Hokkaido and Honshu	Forward	Hokkaido	→	Tohoku	Hokkaido-Honshu HVDC Link, New Hok HVDC Link	DC
	Counter	Tohoku	→	Hokkaido		
Interconnection line between Tohoku and Tokyo	Forward	Tohoku	→	Tokyo	Soma–Futaba bulk line, Iwaki bulk line	AC
	Counter	Tokyo	→	Tohoku		
Interconnection facilities between Tokyo and Chubu	Forward	Tokyo	→	Chubu	Sakuma FC Shin Shinano FC Higashi Shimizu FC Hida–Shinano FC	DC
	Counter	Chubu	→	Tokyo		
Interconnection line between Chubu and Kansai	Forward	Chubu	→	Kansai	Mie–Higashi Omi line	AC
	Counter	Kansai	→	Chubu		
Interconnection facilities between Chubu and Hokuriku	Forward	Chubu	→	Hokuriku	Interconnection facilities of Minami Fukumitsu HVDC BTB Converter Station and Minami Fukumitsu Substation	DC
	Counter	Hokuriku	→	Chubu		
Interconnection line between Hokuriku and Kansai	Forward	Hokuriku	→	Kansai	Echizen–Reinan line	AC
	Counter	Kansai	→	Hokuriku		
Interconnection lines between Kansai and Chugoku	Forward	Kansai	→	Chugoku	Seiban–Higashi Okayama line, Yamazaki–Chizu line	AC
	Counter	Chugoku	→	Kansai		
Interconnection facilities between Kansai and Shikoku	Forward	Kansai	→	Shikoku	Interconnection facilities between Kihoku and Anan AC/DC Converter Station	DC
	Counter	Shikoku	→	Kansai		
Interconnection line between Chugoku and Shikoku	Forward	Chugoku	→	Shikoku	Honshi interconnection line	AC
	Counter	Shikoku	→	Chugoku		
Interconnection line between Chugoku and Kyushu	Forward	Chugoku	→	Kyushu	Kanmon interconnection line	AC
	Counter	Kyushu	→	Chugoku		

(2) Management of the Cross-regional Interconnection Lines

The Organization manages the interconnection lines according to the provisions of Articles 124 to 155 of the Operational Rules. From the perspective of the effective use of interconnection lines, the security of fairness and transparency, and the environmental development of markets, the Organization revised the cross-regional interconnection use rules on October 2018 from those based on a first-come, first-served principle to those based on the implicit auction scheme.[21] The implicit auction scheme entirely allocates the capabilities of the interconnection lines through the energy markets but does not directly allocate the position or right of use of the interconnection lines through auctions. The main differences after the rule revision are as follows.

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Termination of capability allocation plans and changes of timing of capability registration of interconnection lines

As shown in Figure 2-2, before the introduction of the implicit auction scheme, capability allocation was accumulated on a first-come, first-served basis, and the resulting ATC at 10:00 on the day before was used for the day-ahead transaction (transaction of electricity to be received on the next day which is operated by JEPX, and the same shall apply hereinafter). Meanwhile, after the introduction of the implicit auction scheme, the whole capability (except for margins) of interconnection lines is allocated to the day-ahead transaction.

Thus, there are no capability allocation plans, and the capability is registered after the day-ahead transaction according to the revision of the use rules for cross-regional interconnection lines from a first-come, first-served basis to the "implicit auction" scheme under which the capabilities are allocated through wholesale electricity markets.

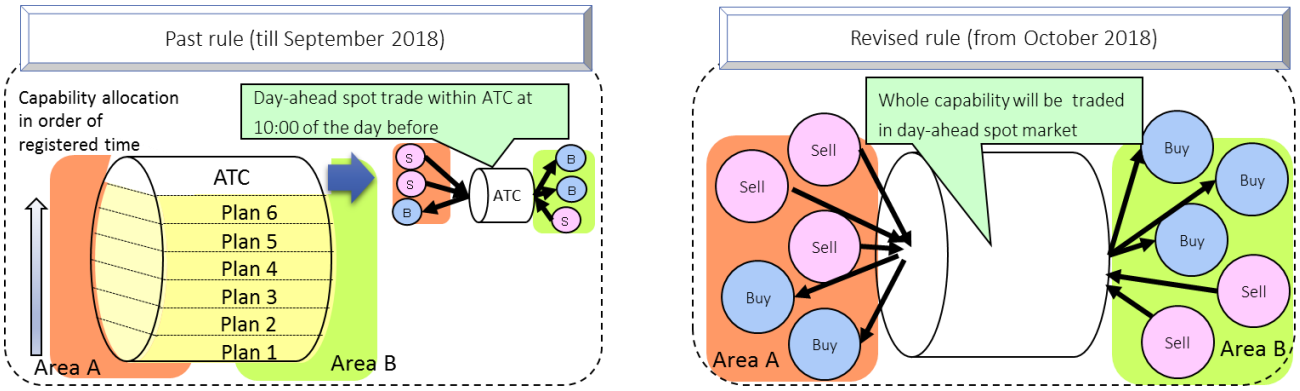

Figure 2-2: Management of the interconnection lines

[21] https://www.occto.or.jp/occtosystem2/kansetsu_auction_gaiyou.html

2. Actual Use of Cross-Regional Interconnection Lines

The following section reports the actual use of cross-regional interconnection lines that are managed by the Organization according to the provisions of Article 124 of the Operational Rules.

(1) Monthly Use of Cross-regional Interconnection Lines in FY 2024

Table 2-2 and Figure 2-3 present the monthly and annual use of the interconnection lines in FY 2024. The annual actual use between the respective regional service areas is described in decreasing order as follows: 1) Tohoku to Tokyo: 37,303 GWh, 2) Chugoku to Kansai: 17,022 GWh, 3) Kansai to Chubu: 16,409 GWh, 4) Kyushu to Chugoku: 14,684 GWh, and 5) Shikoku to Chugoku: 7,001 GWh.

Table 2-2: Monthly and annual use of cross-regional interconnection lines for the regional service areas

[GWh]

		Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Annual
Hokkaido - Honshu	→Tohoku (Forward)	146	147	106	54	272	287	325	191	39	31	141	110	1,850
	→Hokkaido (Counter)	58	94	68	69	26	18	13	48	217	237	80	126	1,053
Tohoku-Tokyo	→Tokyo (Forward)	2,504	2,667	2,573	3,517	4,114	3,143	3,147	2,870	2,989	3,400	3,322	3,057	37,303
	→Tohoku (Counter)	52	49	51	64	64	95	45	32	45	52	50	36	635
Tokyo-Chubu	→Chubu (Forward)	185	118	70	189	353	182	34	131	275	224	447	326	2,533
	→Tokyo (Counter)	529	603	542	621	432	458	458	419	381	622	289	307	5,660
Chubu-Kansai	→Kansai (Forward)	34	53	30	82	100	45	24	32	26	46	90	103	666
	→Chubu (Counter)	1,171	1,555	1,443	1,322	1,145	1,532	1,496	1,549	1,555	1,532	1,093	1,016	16,409
Chubu-Hokuriku	→Hokuriku (Forward)	7	0	4	0	2	15	1	0	0	0	7	7	43
	→Chubu (Counter)	264	147	79	99	68	130	123	155	158	153	69	74	1,519
Hokuriku - Kanasai	→Kansai (Forward)	38	65	80	418	451	133	135	153	98	86	54	191	1,901
	→Hokuriku (Counter)	288	161	98	41	36	41	102	110	146	255	196	73	1,548
Kansai-Chugoku	→Chugoku (Forward)	443	148	75	77	80	58	44	57	31	49	44	53	1,161
	→Kansai (Counter)	551	840	896	1,658	1,378	1,180	1,105	1,447	1,676	2,244	1,919	2,129	17,022
Kansai-Shikoku	→Shikoku (Forward)	7	0	17	0	1	0	0	0	0	0	0	0	25
	→Kansai (Counter)	435	54	385	0	30	49	40	65	102	54	79	64	1,356
Chugoku - Shikoku	→Shikoku (Forward)	9	10	10	76	49	28	22	25	4	14	6	27	282
	→Chugoku (Counter)	315	718	547	634	238	526	463	770	787	738	700	565	7,001
Chugoku - Kyushu	→Kyushu (Forward)	27	19	17	19	24	22	20	13	11	14	16	24	226
	→Chugoku (Counter)	486	679	1,021	1,433	1,379	1,413	1,172	1,349	1,514	1,449	1,388	1,401	14,684

* Based on the scheduled power flows of interconnection lines. Figures are shown before offsetting is performed.
* The figures in red and blue represent the annual maximum and minimum capabilities for each interconnection line and direction, respectively.
* Figures were rounded off to the first decimal place.

Figure 2-3: Monthly utilization of cross-regional interconnection lines for the regional service areas

(2) Actual Use of Cross-Regional Interconnection Lines from FY 2015 to FY 2024

Table 2-3 and Figure 2-4 present the annual use of interconnection lines from FY 2015 to FY 2024. In FY 2024, the actual use of Tohoku to Tokyo registered maximum records in the past decade (FY 2015 to 2024) continuously from the last fiscal year. While the use of Shikoku to Kansai significantly decreased because of constraints on the operation for the avoidance of oil leakage from power cables, the use of Shikoku to Chugoku has significantly increased.

Table 2-3 Annual use of cross-regional interconnection lines for regional service areas (FY 2015 –2024)

[GWh]

		FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Hokkaido-Honshu	→Tohoku (Forward)	146	237	340	130	279	947	2,607	1,620	1,322	1,850
	→Hokkaido (Counter)	804	1,033	1,270	1,005	2,117	1,154	382	1,058	969	1,053
Tohoku-Tokyo	→Tokyo (Forward)	22,587	23,097	28,238	27,298	27,575	31,396	29,092	25,841	35,535	37,303
	→Tohoku (Counter)	3,714	4,660	7,071	3,139	252	541	897	708	459	635
Tokyo-Chubu	→Chubu (Forward)	693	2,729	3,954	1,711	354	1,497	6,200	2,012	2,086	2,533
	→Tokyo (Counter)	4,513	5,144	5,328	5,116	4,147	3,016	3,043	7,079	6,568	5,660
Chubu-Kansai	→Kansai (Forward)	3,412	5,538	8,106	3,675	980	4,413	2,964	1,300	599	666
	→Chubu (Counter)	7,577	6,544	9,889	9,980	7,175	13,285	17,251	28,458	18,008	16,409
Chubu-Hokuriku	→Hokuriku (Forward)	108	241	353	134	7	91	96	29	19	43
	→Chubu (Counter)	172	59	108	76	40	458	2,063	1,177	1,653	1,519
Hokuriku-Kanasai	→Kansai (Forward)	2,047	2,033	2,949	2,033	2,918	3,223	3,005	3,467	921	1,901
	→Hokuriku (Counter)	502	640	1,260	2,540	547	620	376	477	2,570	1,548
Kansai-Chugoku	→Chugoku (Forward)	948	716	4,493	4,734	578	584	564	435	666	1,161
	→Kansai (Counter)	9,138	13,179	16,727	13,388	9,793	12,416	15,056	20,302	16,485	17,022
Kansai-Shikoku	→Shikoku (Forward)	2	2	1	82	31	10	28	7	36	25
	→Kansai (Counter)	9,611	8,856	9,510	8,840	9,956	8,623	8,343	9,831	9,765	1,356
Chugoku-Shikoku	→Shikoku (Forward)	3,423	3,294	4,061	2,579	131	245	113	123	174	282
	→Chugoku (Counter)	4,631	7,638	7,540	4,023	4,143	1,445	1,756	2,398	3,032	7,001
Chugoku-Kyushu	→Kyushu (Forward)	2,174	1,935	3,014	1,998	138	177	142	117	414	226
	→Chugoku (Counter)	14,947	15,476	18,183	18,280	16,311	15,864	17,098	18,536	15,440	14,684

* Based on the scheduled power flows of interconnection lines. Figures are shown before offsetting is performed.
* The figures in red and blue represent the annual maximum and minimum capabilities for each interconnection line and direction, respectively.
* Figures were rounded off to the first decimal place.

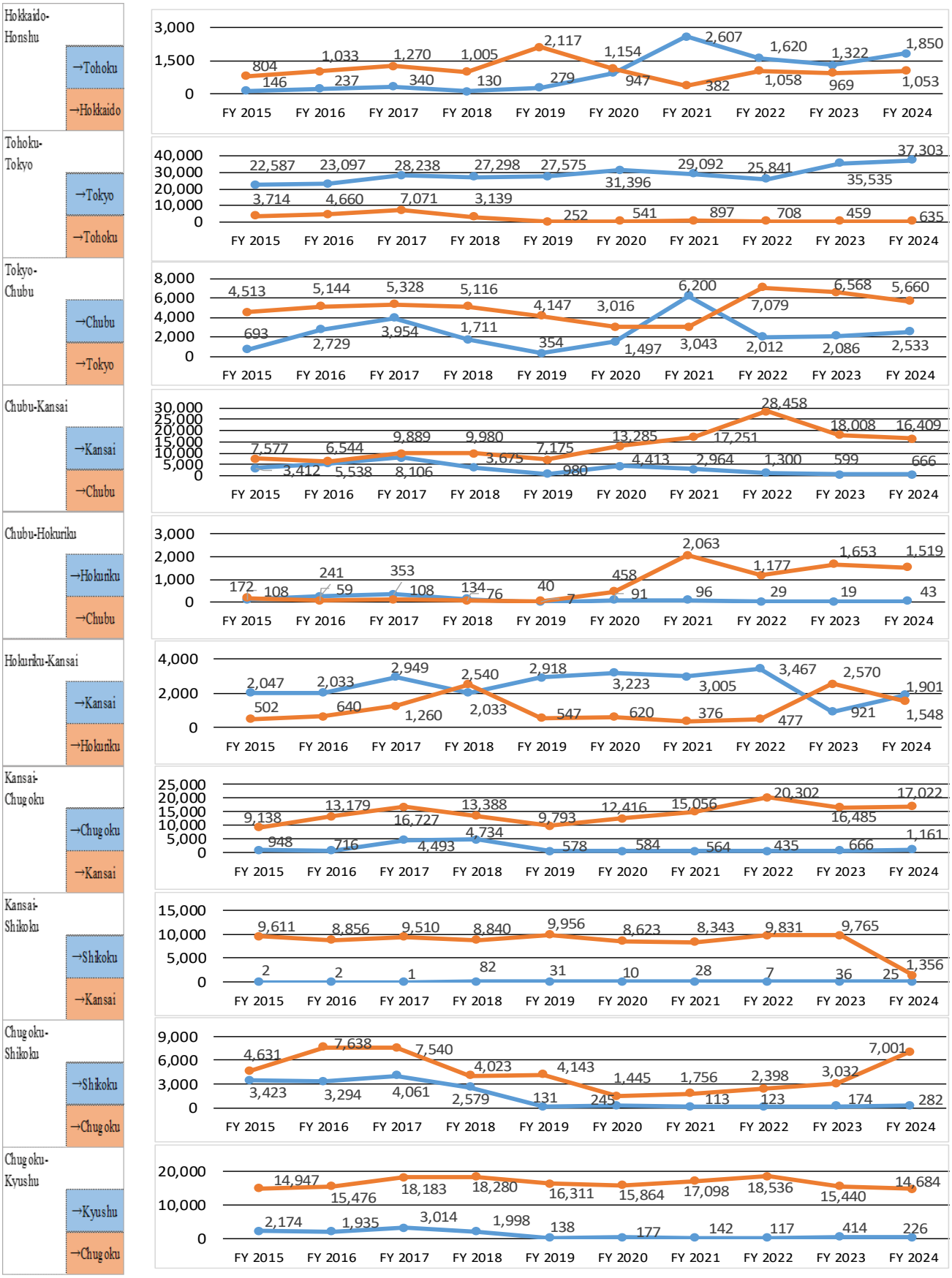

Figure 2-4: Annual use of cross-regional interconnection lines for regional service areas (FY 2015–2024)

(3) Monthly Use of Cross-Regional Interconnection Lines by Transaction in FY 2024

Table 2-4 presents the monthly use of interconnection lines by transaction in FY 2024.

Table 2-4: Monthly and annual utilization of cross-regional interconnection lines by transaction

[GWh]

	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Annual
Day-ahead	6,646	7,080	7,267	9,340	9,193	8,334	8,037	8,773	9,459	10,472	9,188	8,628	102,416
Intra-day	847	955	717	955	992	940	681	623	572	720	768	1,013	9,783
Miscellaneous	55	90	127	81	57	80	52	20	23	8	34	48	677

* The figures in red and blue represent the annual maximum and minimum figures, respectively.
* "Miscellaneous" refers to the use of interconnection lines due to long-cycle cross-regional frequency controls, power exchange instructions, and other causes.

(4) Annual Use of Cross-Regional Interconnection Lines by Transaction from FY 2015 to FY 2024

Table 2-5 and Figures 2-5, 2-6, and 2-7 depict the annual use of interconnection lines by transaction for FY 2015–2024.

While the actual use of interconnection lines for day-ahead transactions has remained almost at the same level in recent years, the actual use for intra-day transaction recorded the maximum in the past decade (FY 2015–2024) in FY 2024 continuously from the last fiscal year.

Table 2-5: Annual use of cross-regional interconnection lines by transaction (FY 2015–2024)

[GWh]

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Day-ahead	13,152	14,817	18,350	51,120	83,216	91,229	102,328	116,101	106,904	102,416
Intra-day	2,050	3,392	4,203	2,932	4,000	7,675	8,382	8,406	9,037	9,783
Miscellaneous	75,947	84,843	109,842	56,710	255	1,103	366	468	782	677

* "Intra-day transaction" means transactions that are four hour (4 h) ahead of the gate closure from FY 2010 until 2015. From FY 2016, it refers to the transactions that are one hour (1 h) ahead of the gate closure.
* "Miscellaneous" includes the use of interconnection lines by bilateral transactions until September 2018 before the introduction of the implicit auction scheme.

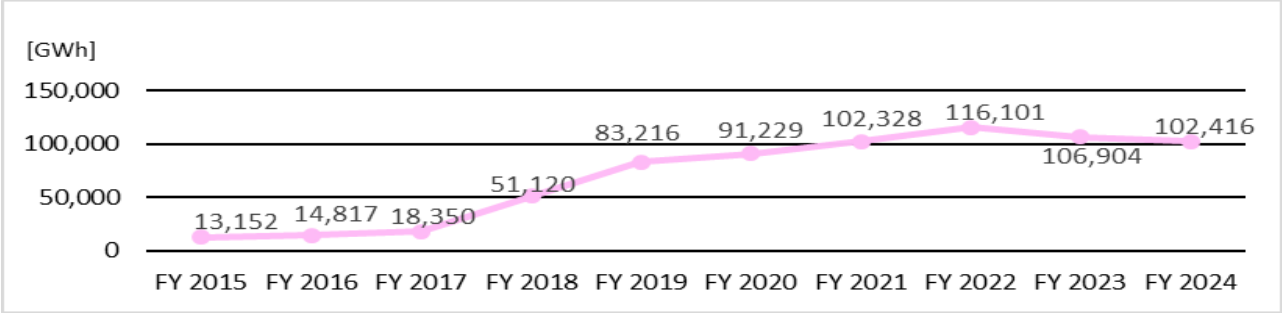

Figure 2-5: Annual use of cross-regional interconnection lines by day-ahead transaction (FY 2015–2024)

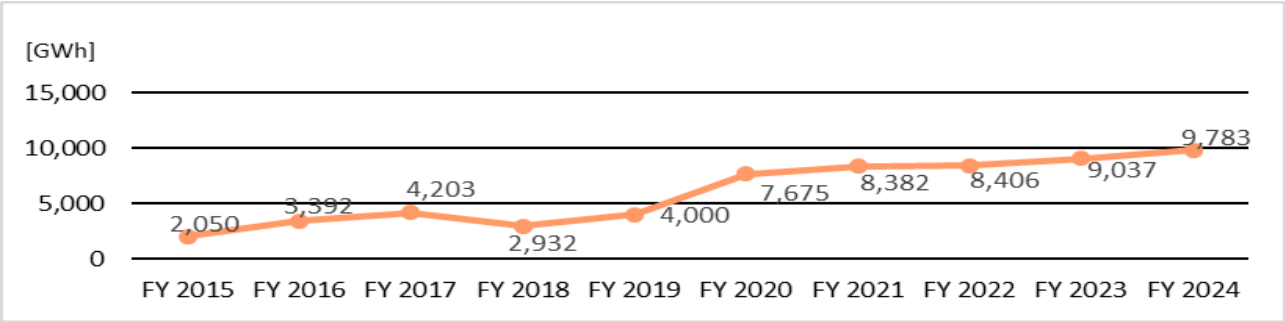

Figure 2-6: Annual use of cross-regional interconnection lines by intra-day transaction (FY 2015–2024)

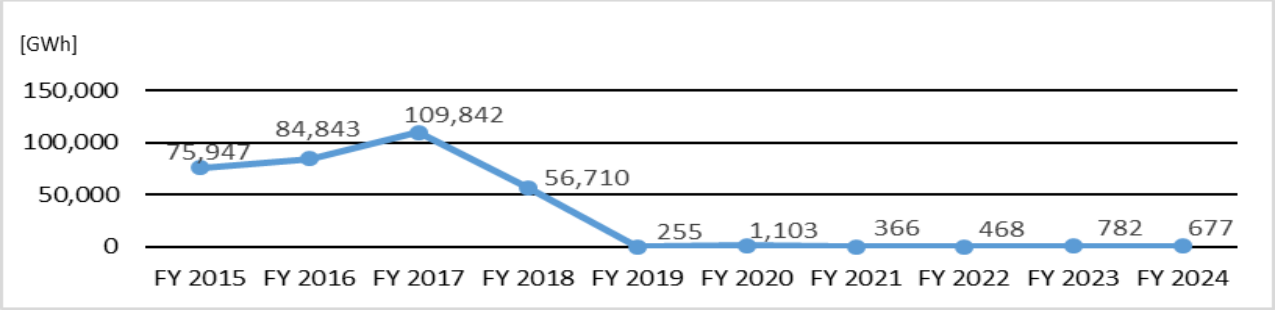

Figure 2-7: Annual use of cross-regional interconnection lines by miscellaneous transaction (FY 2015–2024)

3. State of Congestion of Cross-Regional Interconnection Lines and Regional Systems

(1) State of Congestion of Cross-Regional Interconnection Lines

Figures 2-8 to 2-16 depict the state of congestion of interconnection lines as the number of occurrences of the market splitting upon day-ahead transactions of each month (the number of segments where there is a difference between the agreed prices in two areas connected each other by interconnection lines in the agreed result of day-ahead transaction [for every thirty-minute segment]).

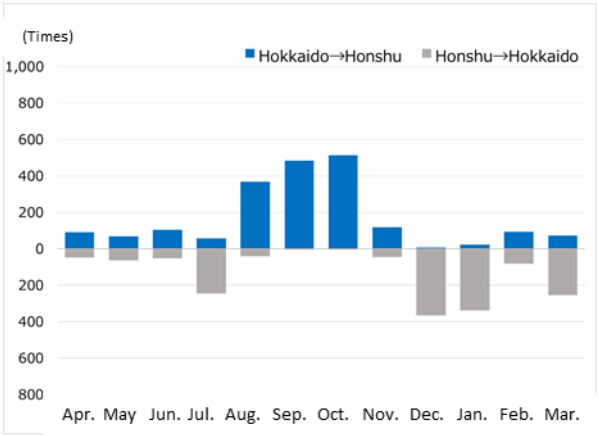

Figure 2-8: Monthly market splits in day-ahead trading (interconnection facilities between Hokkaido and Honshu)

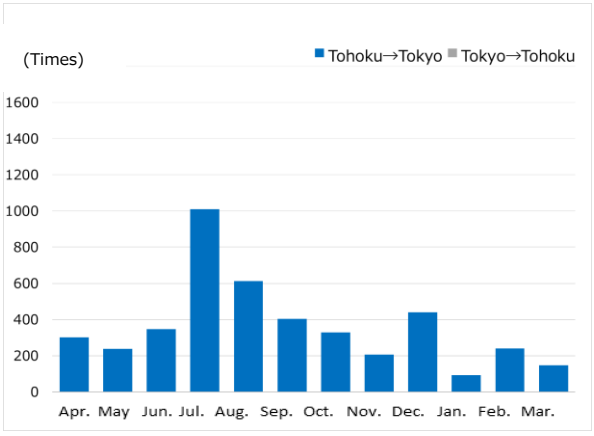

Figure 2-9: Monthly market splits in day-ahead trading (interconnection lines between Tohoku and Tokyo)

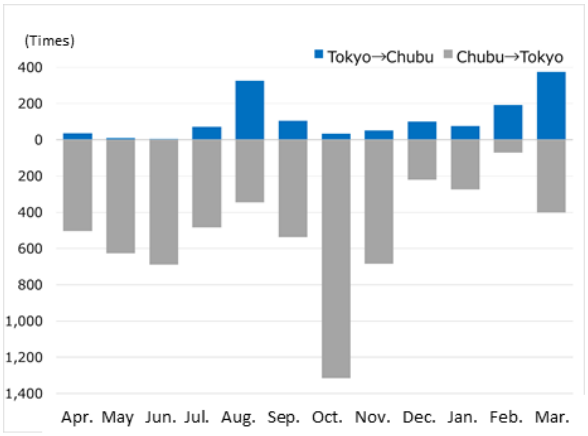

Fig. 2-10 Monthly market splits in day-ahead trading (interconnection facilities between Tokyo and Chubu)

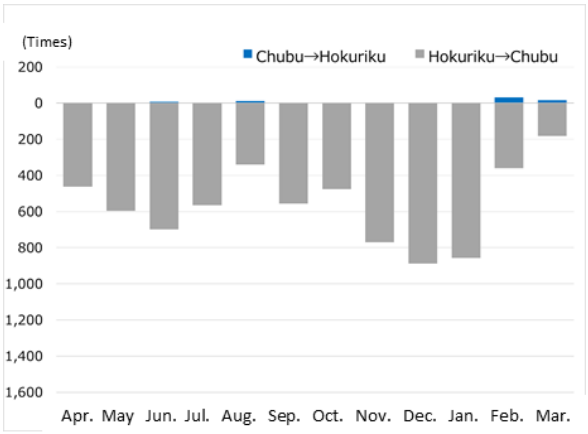

Fig. 2-11 Monthly market splits in day-ahead trading (interconnection lines between Chubu and Hokuriku)

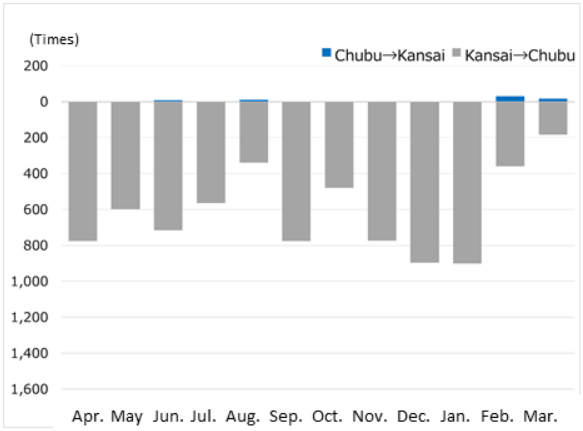

Fig. 2-12 Monthly market splits in day-ahead trading (interconnection lines between Chubu and Kansai)

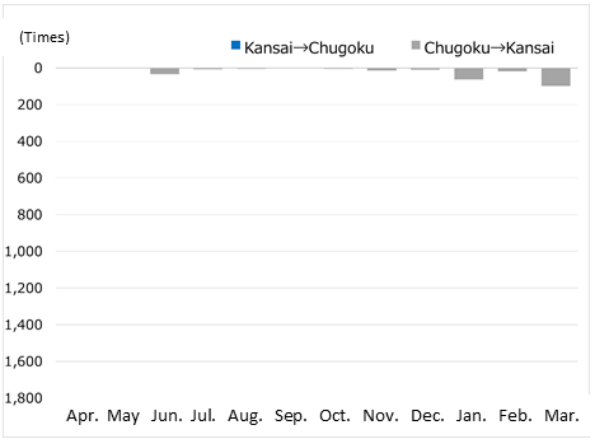

Fig. 2-13 Monthly market splits in day-ahead trading (interconnection lines between Kansai and Chugoku)

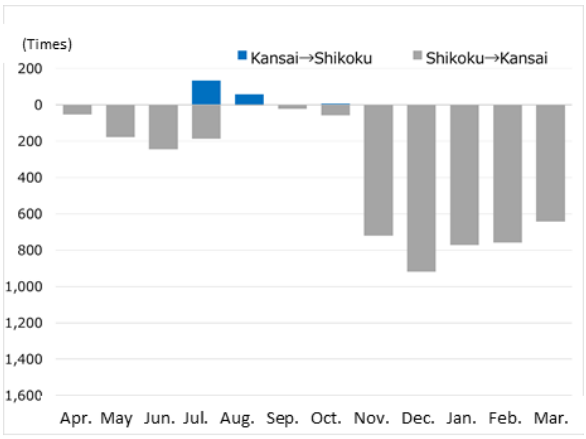

Fig. 2-14 Monthly market splits in day-ahead trading (interconnection facilities between Kansai and Shikoku)

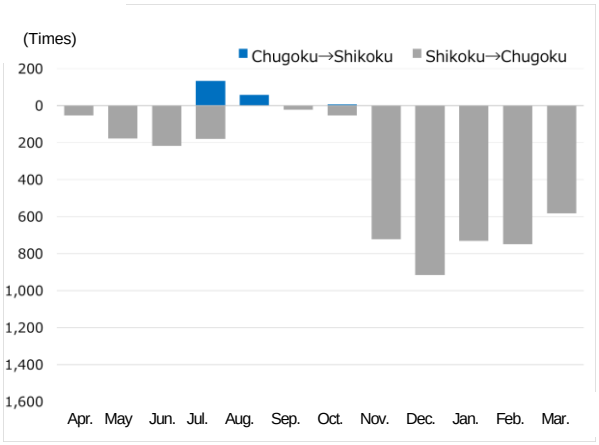

Fig. 2-15 Monthly market splits in day-ahead trading (interconnection lines between Chugoku and Shikoku)

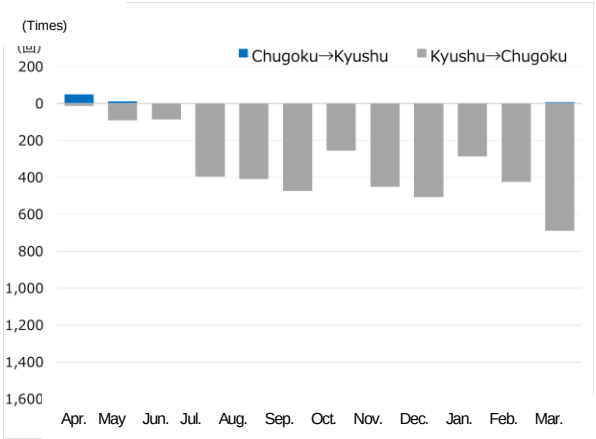

Fig. 2-16 Monthly market splits in day-ahead trading (interconnection lines between Chugoku and Kyushu)

(2) State of Congestion of Distribution Facilities Other Than Cross-Regional Interconnection Lines Under Normal Circumstances

Table 2-6 presents the occurrences of congestion of regional systems other than interconnection lines in FY 2024. In FY 2024, output curtailment along with congestion mitigation of regional distribution facilities was conducted for the first time on two occasions in the Tokyo area and three occasions in the Chubu area. Since such three-time output curtailment in the Chubu area was accompanied by output curtailment of renewable energy generating facilities (variable renewable energy sources), the Organization verified the validity of the orders related to the output curtailment according to the provisions of Paragraph 2 of Article 180 of the Operational Rules.

Table 2-6: Congestions mitigation of regional service area

Month/ Year	Area	System	Output curtailment (number/day)	Curtailed energy (MWh)	Cost of mitigation (thousand Yen)*	Note
1/2025	Tokyo	Boso Substation (main transformer No.1)	2	668.6	1998	
3/2025	Chubu	Seino-Ibi Line (77kV)	3	15.3	-	Output curtailment of renewable energy implemented

* Cost incurred on only bulk transmission lines

4. Actual Available Transfer Capabilities of Each Cross-Regional Interconnection Line

While Figure 2-17 and Table 2-7 present how to see the actual use of the respective interconnection lines, Figures 2-18 to 2-27 from the next page depict the actual use in FY 2024.

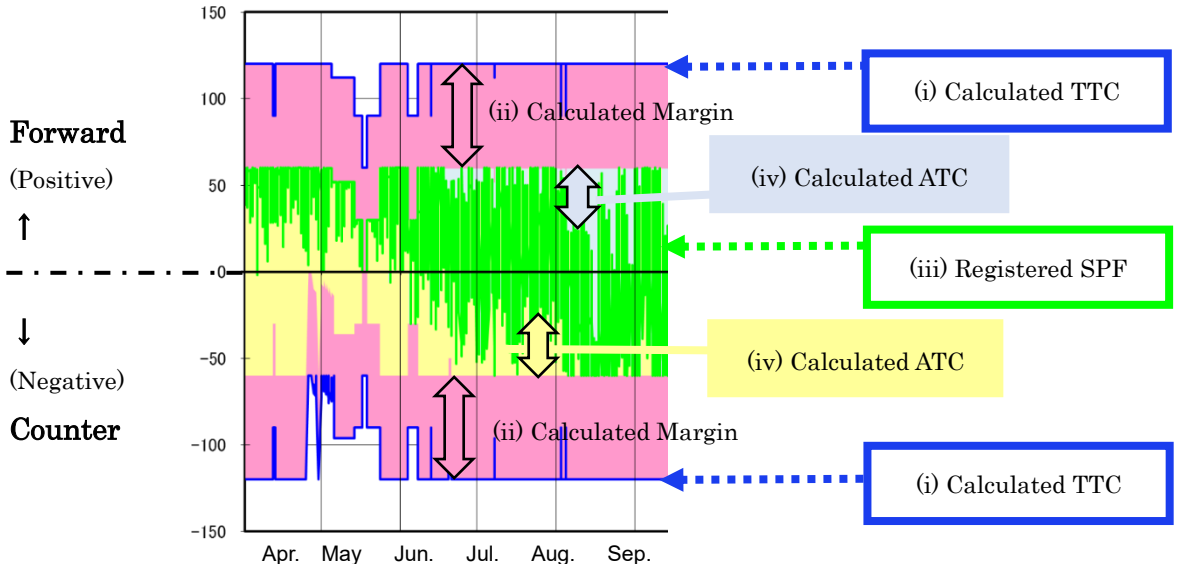

Figure 2-17: How to interpret an ATC graph

Table 2-7: Explanation of the ATC graph components

	By the end of September, 2018	After October, 2018 (introduction of implicit auction scheme)
(i) Calculated TTC	The maximum electricity that can be sent to the distribution facilities while securing supply reliability without damaging the transmission and distribution facilities	The same as the left
(ii) Calculated Transmission Margin	The amount of electricity managed by the Organization as a part of total TTC by the directions of scheduled power flows of the interconnection lines to receive electricity from other regional service areas through interconnection lines under abnormal situations of electric network, supply shortage or other emergent situations, to keep stabilizing the electric network, or to develop an environment of market trading of electricity, or to procure balancing capacity from other regional service areas. Power flows of allocation plans utilizing transmission margin and those employing transmission margin shall be deducted.	The amount of electricity managed by the Organization as a part of total transfer capability of the interconnection lines to receive electricity from other regional service areas through interconnection lines under abnormal situations of electric network, supply shortage or other emergent situations, to keep stabilizing the electric network, or to procure balancing capacity from other regional service areas. Scheduled power flows employing transmission margin shall be deducted.
(iii) Registered SPF	Sum of the registered power flows stated below: 1) allocation plans in "first come, first seerved" principle 2) trade in day-ahead spot market 3) trade in 1 hour-ahead market	Sum of the registered power flows stated below: 1) trade in day-ahead spot market 2) trade in 1 hour-ahead market
(iv) Calculated ATC	(iv) = (i) - (ii) - (iii) The necessary capability for long-cycle cross-regional frequency control shall be immediately deducted from ATC at the decision of its implementation.	The same as the left

The actual flows on the transmission lines are offset in each direction. Therefore, the scheduled power flow is the offset figure between the forward and counter flows but not the simple addition of each direction. In addition, the offset figures on the graphs are observed as SPF rather than the capacity of each forward and counter flow.

(Reference) Publishing actual ATC
Detailed network system information including actual ATC is available at the URL below.
URL http://occtonet.occto.or.jp/public/dfw/RP11/OCCTO/SD/LOGIN_login#

Figure 2-18: Actual ATC for the interconnection facilities between Hokkaido and Honshu
(Hokkaido–Honshu HVDC Link, and New Hokkaido–Honshu HVDC Link)

Note: Hokkaido to Tohoku is considered a forward (positive) flow, with Tohoku to Hokkaido being a counter (negative) flow.

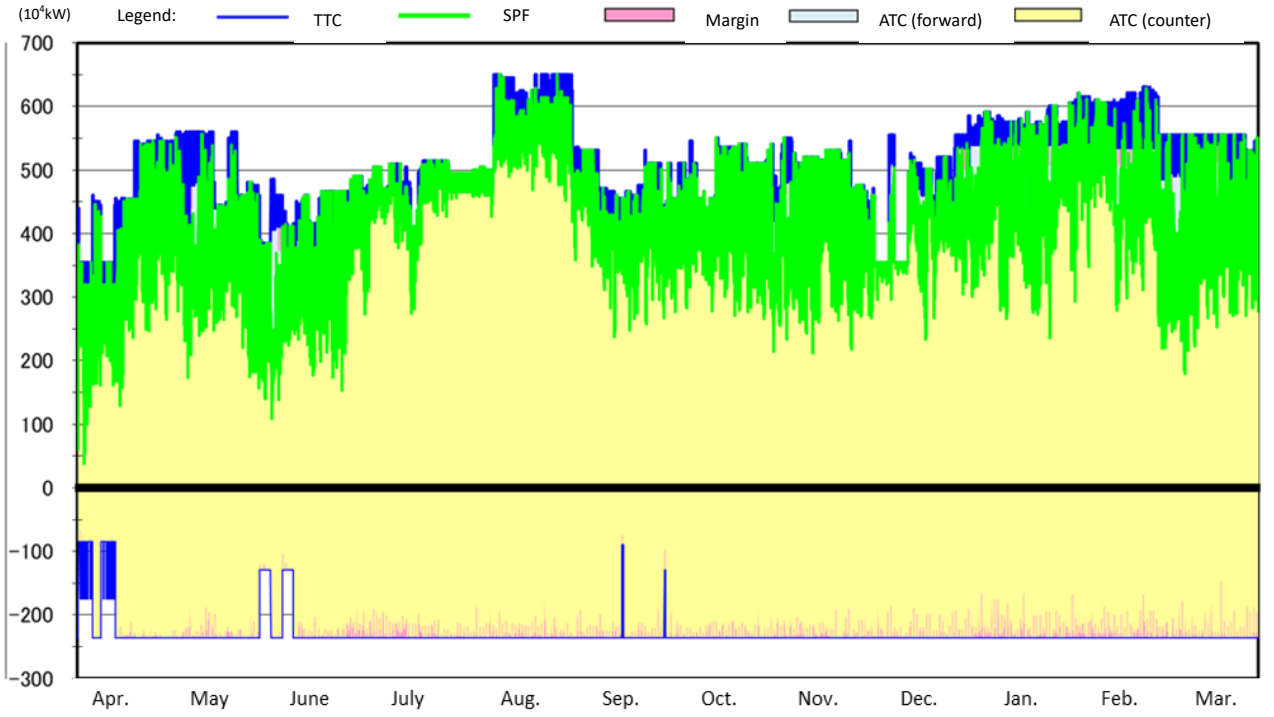

Figure 2-19: Actual ATC for the interconnection lines between Tohoku and Tokyo
(Soma–Futaba Bulk Line and Iwaki Bulk Line)

Note: Tohoku to Tokyo is considered a forward (positive) flow, with Tokyo to Tohoku being a counter (negative) flow.

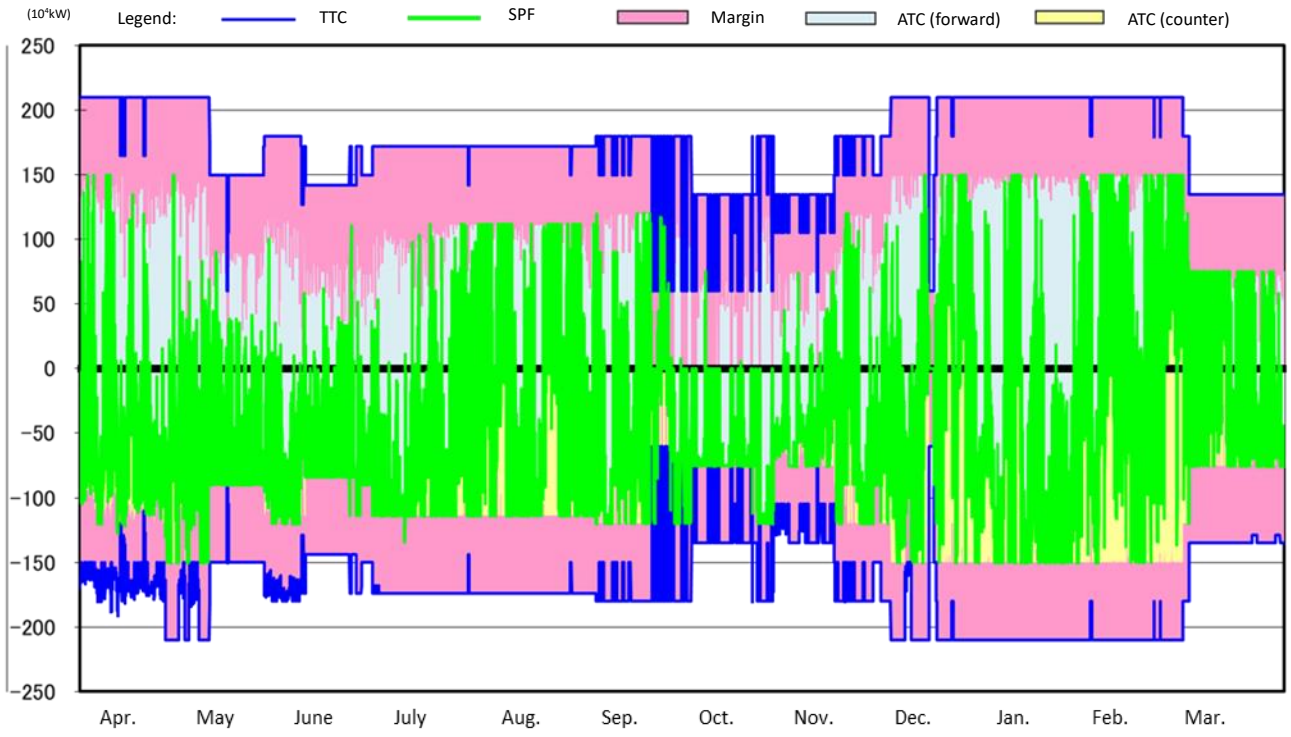

Figure 2-20: Actual ATC for the interconnection facilities between Tokyo and Chubu
(Sakuma, Shin Shinano and Higashi Shimizu and Hida–Shinano F.C.)

Note: Tokyo to Chubu is considered a forward (positive) flow, with Chubu to Tokyo being a counter (negative) flow.

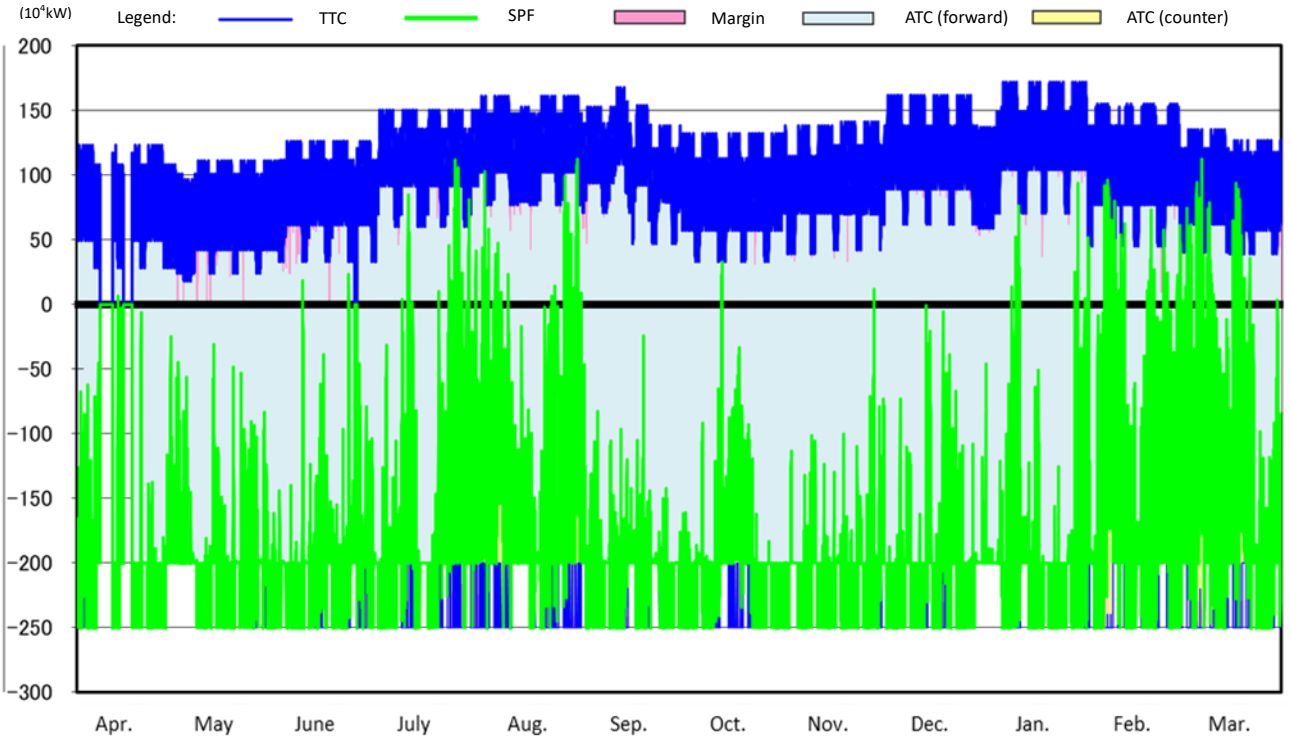

Figure 2-21: Actual ATC for the interconnection line between Chubu and Kansai (Mie–Higashi Omi Line)

Note: Chubu to Kansai is considered a forward (positive) flow, with Kansai to Chubu being a counter (negative) flow.

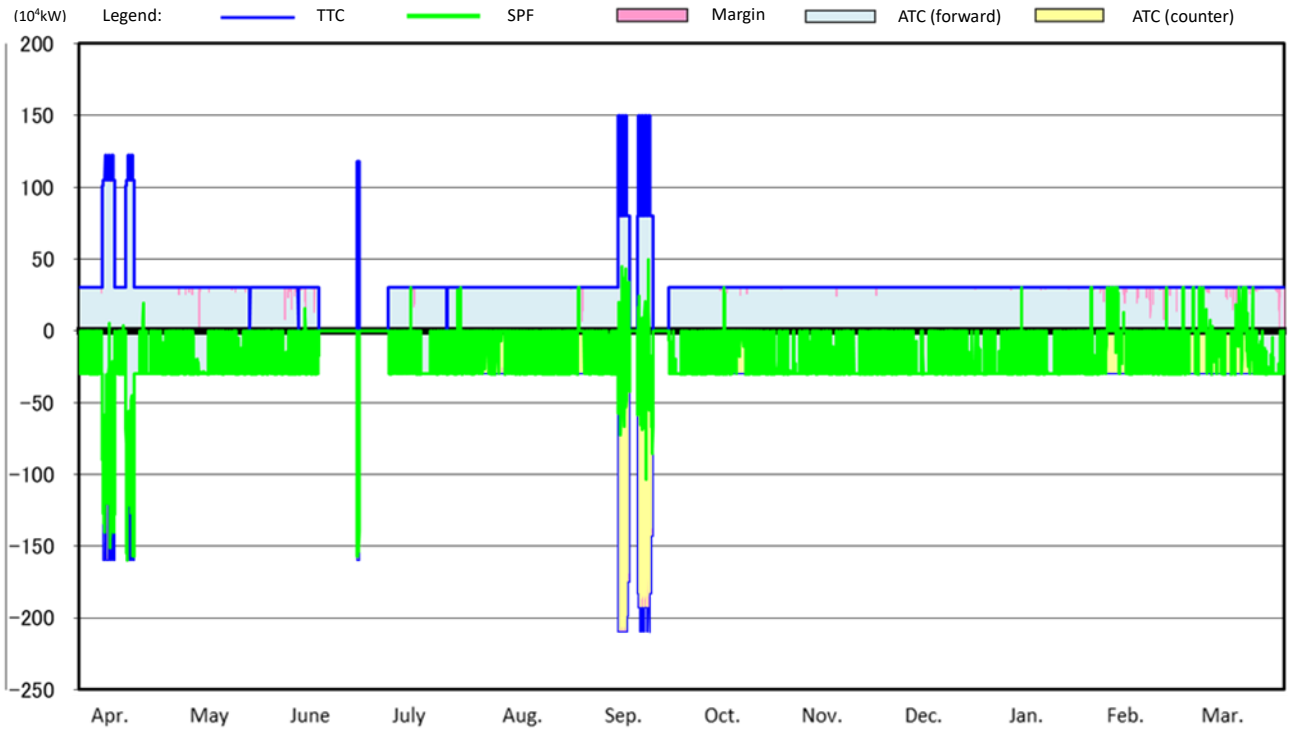

Figure 2-22: Actual ATC for the interconnection facilities between Chubu and Hokuriku
(Minami Fukumitsu HVDC BTB Converter Station and Minami Fukumitsu Substation)

Note: Chubu to Hokuriku is considered a forward (positive) flow, with Hokuriku to Chubu being a counter (negative) flow.

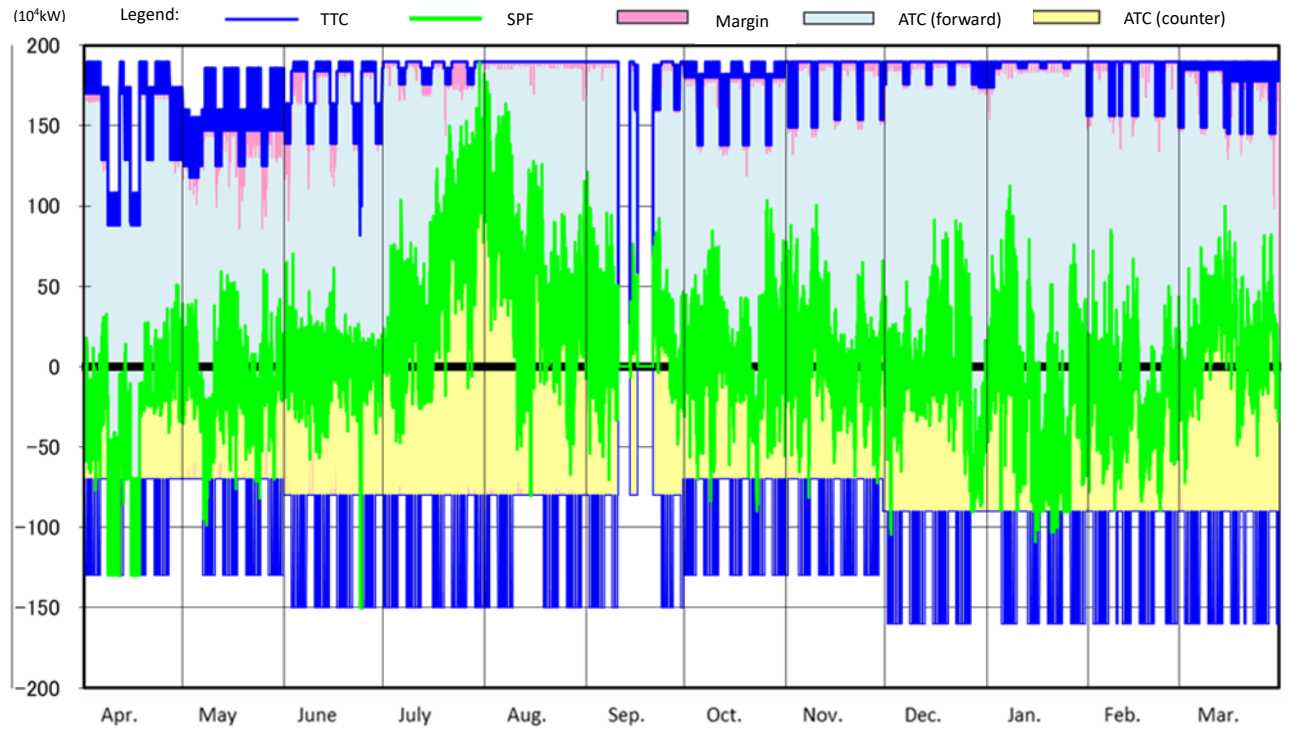

Figure 2-23: Actual ATC for the interconnection line between Hokuriku and Kansai (Echizen–Reinan Line)

Note: Hokuriku to Kansai is considered a forward (positive) flow, with Kansai to Hokuriku being a counter (negative) flow.

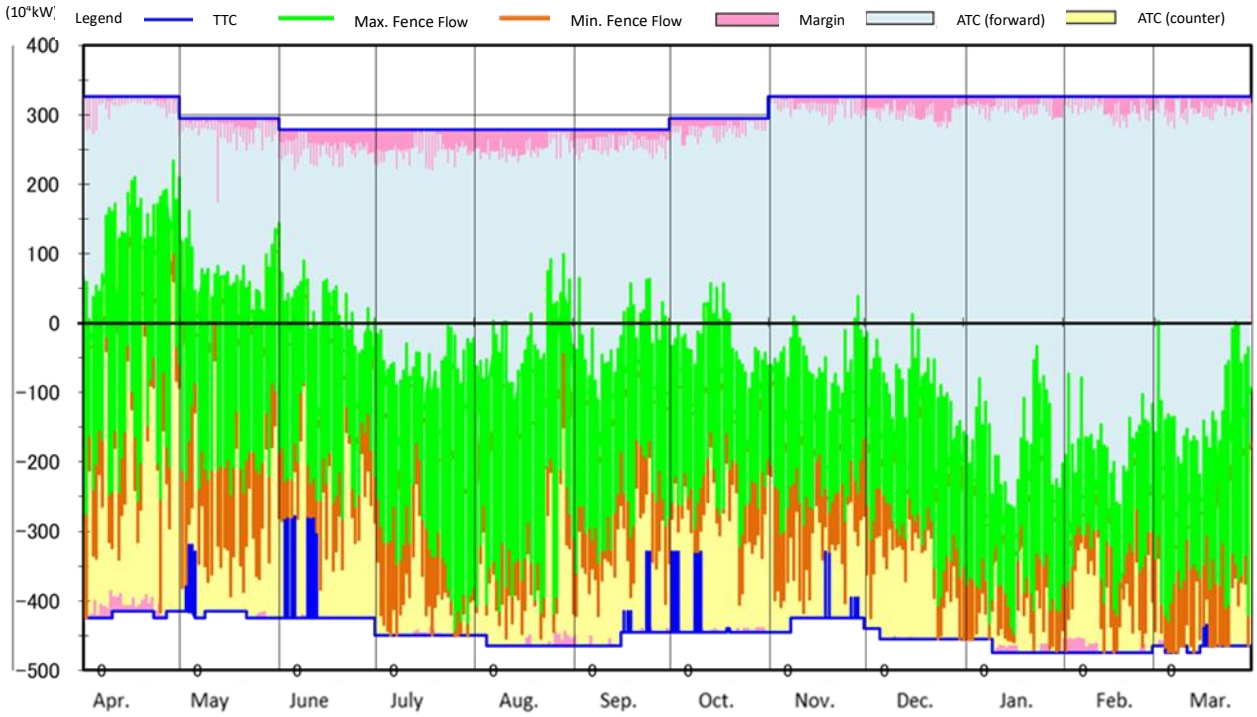

Figure 2-24: Actual ATC for the interconnection lines between Kansai and Chugoku
(Seiban–Higashi Okayama Line and Yamazaki–Chizu Line)

Note: Kansai to Chugoku is considered a forward (positive) flow, with Chugoku to Kansai being a counter (negative) flow.

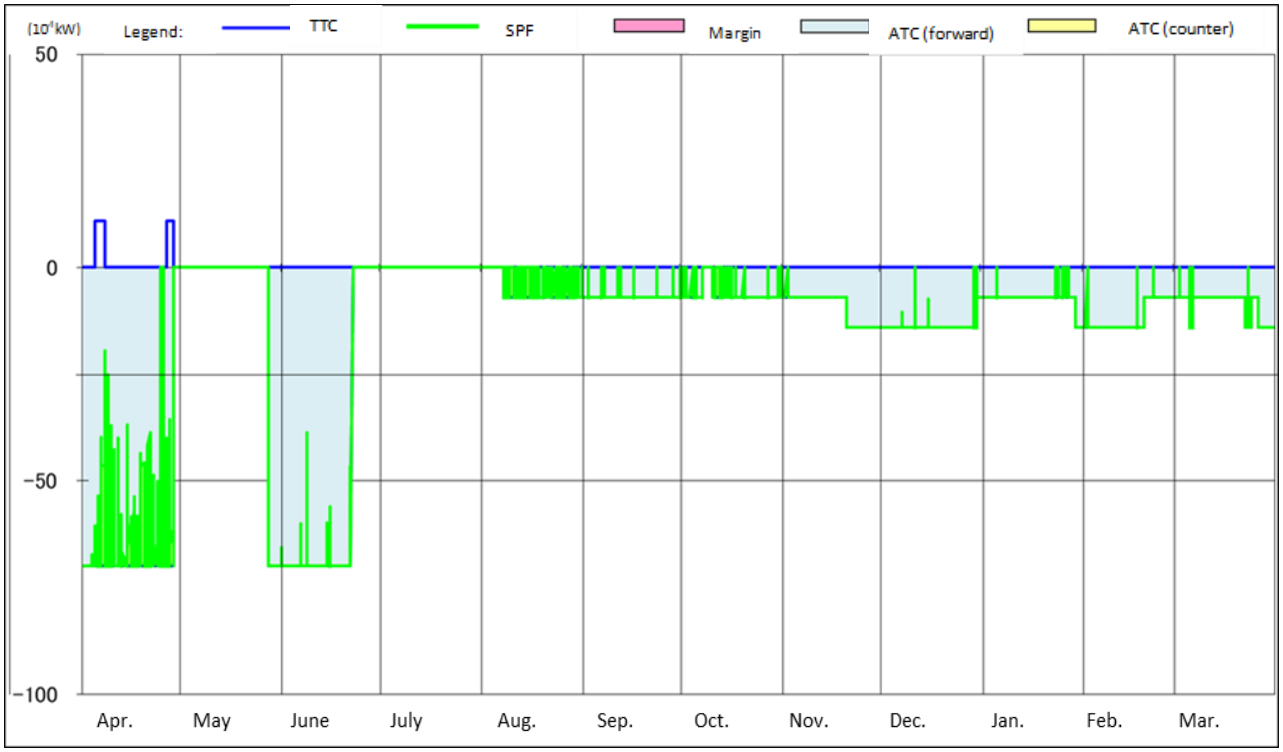

Figure 2-25: Actual ATC for the interconnection facilities between Kansai and Shikoku
(Interconnection facilities between Kihoku and Anan AC/DC Converter Station)

Note: Kansai to Shikoku is considered a forward (positive) flow, with Shikoku to Kansai being a counter (negative) flow.
*The ATC for the forward flow is calculated and chosen as the smaller from the following.
・TTC−transfer margin−SPF.
・TTC of Minami Awa Bulk Line− (Supply Capacity of Tachibanawan Thermal Power Station−SPF of Anan−Kihoku DC Bulk Line).

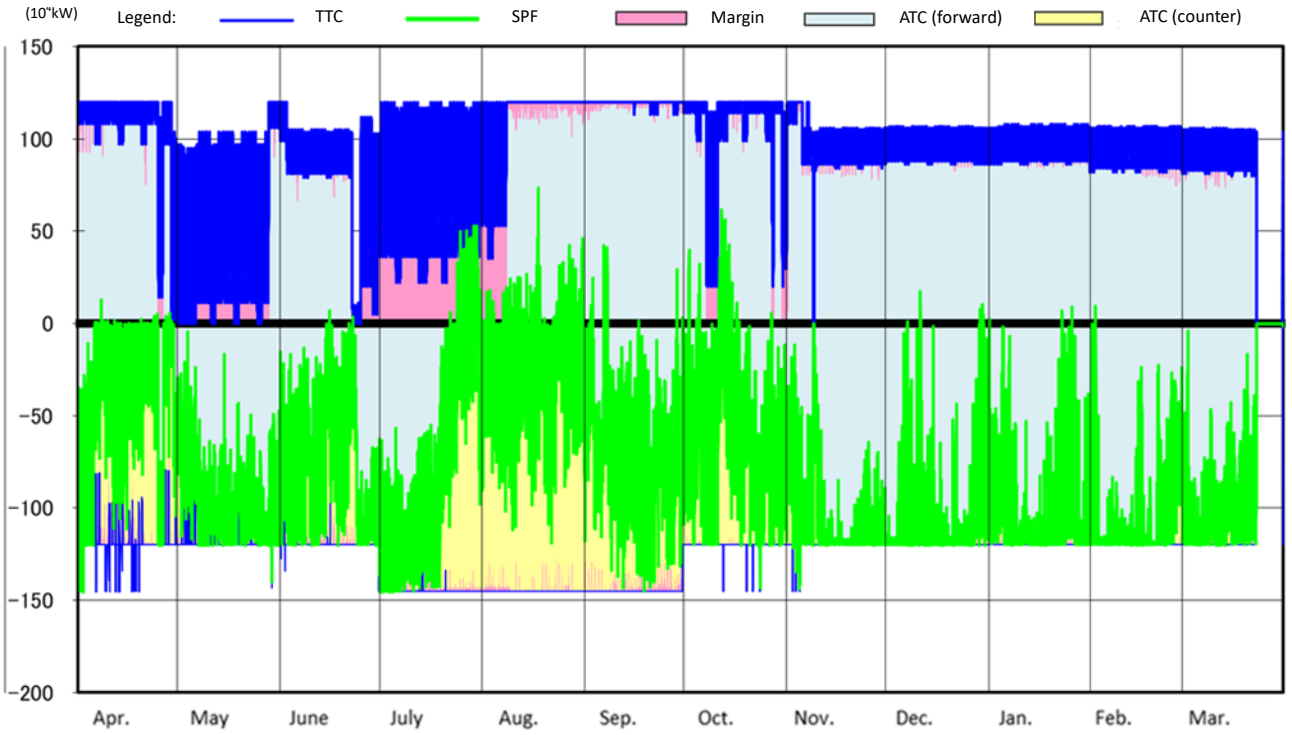

Figure 2-26: Actual ATC for the interconnection line between Chugoku and Shikoku (Honshi Interconnection Line)

Note: Chugoku to Shikoku is considered a forward (positive) flow, with Shikoku to Chugoku being a counter (negative) flow.

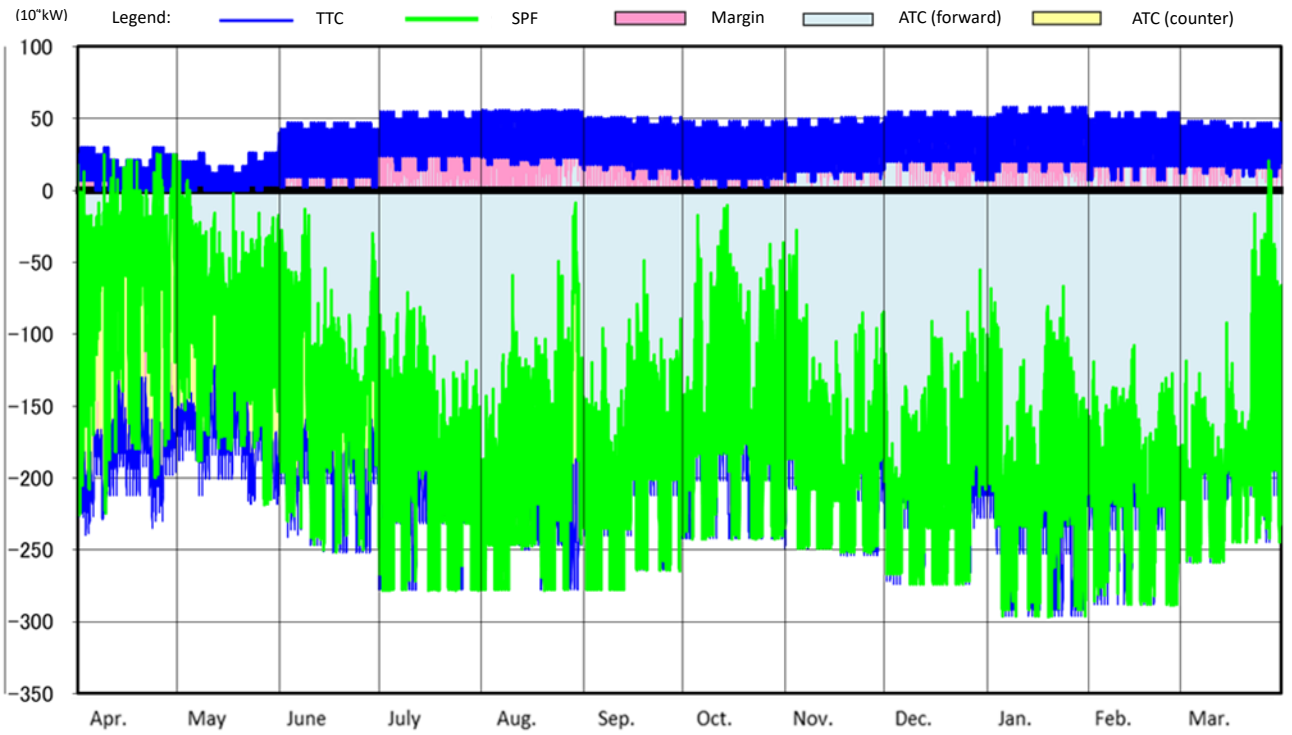

Figure 2-27: Actual ATC for the interconnection line between Chugoku and Kyushu (Kanmon Interconnection Line)

Note: Chugoku to Kyushu is considered a forward (positive) flow, with Kyushu to Chugoku being a counter (negative) flow.

5. Maintenance Work on Cross-Regional Interconnection Lines

The following describes the details of the actual maintenance work of the cross-regional interconnection lines as reported by the GT&D companies to the Organization in accordance with the provisions of Article 167 of the Operational Rules.

(1) Monthly Maintenance Work of Cross-Regional Interconnection Lines

Table 2-8 presents the monthly and annual maintenance work of the respective interconnection lines in FY 2024, and Figure 2-28 depicts the transition of the nationwide monthly outage rate for maintenance work in FY 2024. The annual maintenance work of the interconnection lines for FY 2024 was implemented on 529 occasions for 1,166 days in total, which recorded maximum numbers since FY 2015. Compared with the previous year, the occasions of work increased 190 times, and the total days of work increased by 390 days. The Shin Shinano Frequency Converter (FC) (replacement of protection equipment etc.) and the interconnection facilities between the Kihoku Converter Station and the Anan Converter Station (replacement of protection equipment etc.) had much work on both occasions and days. The suspension for security reasons due to the forest fire that occurred in the Shikoku area on March 23, 2025, is included in the number of days of maintenance work of the Honshi interconnection lines (March 23 to 31: nine days).

Table 2-8: Monthly and annual maintenance works on cross-regional interconnection lines

Interconnection	Corresponding Facilities	Apr.		May		Jun.		Jul.		Aug.		Sep.		Oct.		Nov.		Dec.		Jan.		Feb.		Mar.		Annual	
		Nos.	Days	Nos.	Days	Nos.	Days	Nos.	Days	Nos.	Days	Nos.	Days	Nos.	Days	Nos.	Days	Nos.	Days	Nos.	Days	Nos.	Days	Nos.	Days	**Nos.**	**Days**
Hokkaido-Honshu	Hokkaido and Honshu HVDC Link, New Hokkaido and Honshu HVDC Link	5	8	1	1	8	11	10	31	22	30	20	29	11	14	0	0	0	0	0	0	2	2	2	5	81	131
Tohoku-Tokyo	Soma-Futaba bulk line, Iwaki bulk line	0	0	5	4	5	4	0	0	0	0	1	1	0	0	0	0	2	10	0	0	0	0	0	0	13	19
Tokyo-Chubu	Sakuma FC C.S.	0	0	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	31	8	34
	Shin Shinano FC C.S.	0	0	15	22	13	30	6	31	7	31	26	30	25	31	22	30	8	5	0	0	1	1	2	4	125	215
	Higashi Shimizu FC C.S.	0	0	0	0	13	14	3	1	0	0	0	0	0	0	5	4	4	1	0	0	1	1	0	0	26	21
	Hida–Shinano FC	5	3	2	2	2	1	0	0	0	0	9	8	44	29	16	15	2	2	0	0	0	0	2	29	82	89
Chubu-Kansai	Mie-Higashi Omi line	11	7	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	8
Chubu-Hokuriku	Minami Fukumitsu HVDC BTB C.S., Minami Fukumitsu Substation	2	7	1	1	4	20	3	4	0	0	7	16	0	0	0	0	0	0	0	0	0	0	0	0	17	48
Hokuriku-Kansai	Echizen-Reinan line	0	0	0	0	0	0	0	0	0	0	8	9	0	0	0	0	0	0	0	0	0	0	0	0	8	9
Kansai-Chugoku	Seiban-Higashi Okayama line, Yamazaki-Chizu line	1	1	4	3	2	8	0	0	0	0	6	5	5	6	7	5	0	0	0	0	0	0	2	2	27	30
Kansai-Shikoku	Kihoku and Anan AC/DC C.S.	3	30	4	31	3	30	5	31	4	31	3	30	16	31	17	30	11	31	12	31	13	28	13	31	104	365
Chugoku-Shikoku	Honshi interconnection line	0	0	0	0	4	23	0	0	0	0	0	0	0	0	5	25	1	31	1	31	1	28	2	31	14	169
Chugoku-Kyushu	Kanmon interconnection line	3	14	7	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	28
Nationwide (Cumulative works for the same facilities deducted)		30	70	39	78	60	144	27	98	33	92	80	128	101	111	72	109	28	80	13	62	20	61	26	133	529	1166

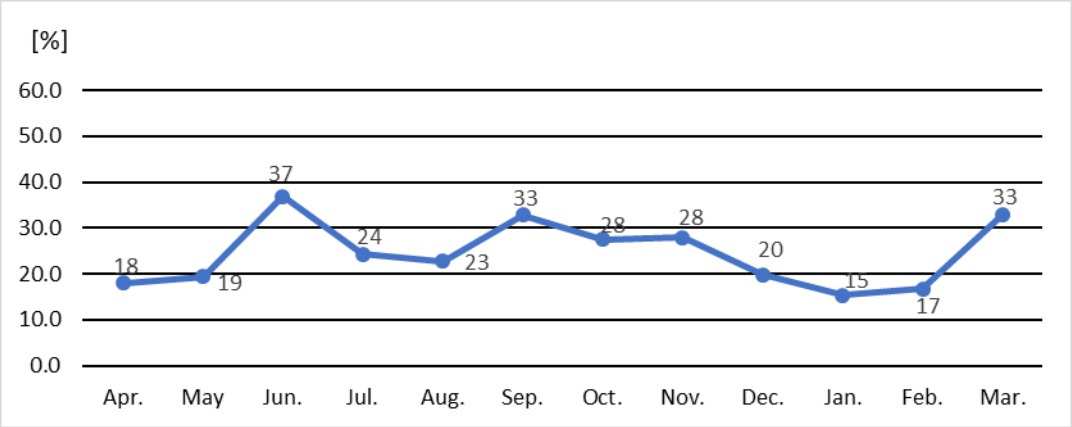

Figure 2-28: Nationwide monthly planned outage rate

$$\text{* Monthly Planned Outage Rate (\%)} = \frac{\textbf{Total days of planned outage in the month}}{\textbf{13 interconnection lines} \times \textbf{calendar days}}$$

(2) Annual Maintenance Work of Cross-regional Interconnection Lines

Table 2-9 presents the annual maintenance work on cross-regional interconnection lines for FY 2015–FY 2024.

Table 2-9: Annual maintenance work on cross-regional interconnection lines (FY 2015–FY 2024)

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	10-years Average
Numbers	91	218	267	205	353	385	379	423	339	529	319
Days	317	451	432	446	599	534	909	605	776	1,166	624

* The significant increase from FY 2015 to FY 2016 is attributable to the introduction of the Cross-Regional Operation System, which made detailed data management available.

6. Forced Outage of the Cross-Regional Interconnection Lines

(1) Forced Outage of the Cross-Regional Interconnection Lines

Table 2-10 presents the forced outage of the interconnection lines in FY 2024. Ten of the total eleven outages occurred at DC interconnection facilities (including FC), and the other one outage occurred at the AC interconnection lines of the Honshi interconnection lines (power cable earth fault).
Details of the interruption of power supply that occurred in the Shikoku area on November 9, 2024, shall be explained in "Report on the Quality of Electricity Supply -Data for FY 2024".

Table 2-10: Forced outage of the cross-regional interconnection lines

Date	Facility	Background
April 6	Hokkaido-Honshu HVDC Link 2L	Damage of switching gear for shunt reactor of 2nd pole in Kamikita FC
May 15	Hida–Shinano FC	Failure of control device
June 6	Minami Fukumitsu HVDC BTB Converter Station	Over-voltage of 77kV bus-line
June 12	Minami Fukumitsu HVDC BTB Converter Station	Clogging of oil-conduit pipe between feeding tank and body tank
July 27	Higashi Shimizu FC	Secondary accident of network
August 18	Sakuma FC	Secondary accident of network
August 27	Shin Shinano FC unit No.1	Incorrect cut of charging cable
October 26	Hida–Shinano FC	Abnormal communication by fading
November 9	Honshi interconnection line 1L	Cable ground fault
February 7	Hokuto-Imabetsu HVDC Link	Execessing redundant figure for N-arm of 1st pole in Hokuto FC
February 20	Higashi Shimizu FC	Combinated failures due to detecting waveform distortion

* The forced outage affecting the TTC is described.

(2) Annual Forced Outage of Cross-regional Interconnection Lines

Table 2-11 presents the annual forced outages of interconnection lines from FY 2015 to FY 2024. The number of annual forced outages of interconnection lines in FY 2024 was 11, which was higher than the previous year by two outages, and was the highest on record, along with FY 2021 and FY 2022.

Table 2-11: Annual forced outage of cross-regional interconnection lines (FY 2015–FY 2024)

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	10-years Average
Nationwide	3	3	3	6	9	8	11	11	9	11	7

7. Actual Employment of the Transmission Margin

"Employment of the transmission margin" refers to the exchange of electricity by using the transmission margins set for interconnection lines when the supply-demand balance is or might become tight or the ability to reduce the power supply is or might become insufficient in a service area.

As shown in Table 2-12, the actual employment of the transmission margin after the Organization accepted the necessity of such employment according to the provisions of Article 152 of the Operational Rules was one occasion in FY 2024, which was performed by using the margin of the interconnection facilities between Tokyo and Chubu (toward Tokyo) in order to eliminate supply shortages in the Tokyo area on July 8, 2024. Table 2-13 presents the annual actual employment of the transmission margin from FY 2015 to FY 2024.

As shown in Table 2-14, there was no occasion where the Organization accepted the necessity of the expansion of the TTC of the interconnection lines in accordance with the provisions of Article 153 of the Operational Rules, and the margin was actually employed in FY 2024.

Table 2-12: Actual employment of the transmission margin

Date	Facility	Background
July 8, 2024	Interconnection facilities between Tokyo and Chubu (Flow from Chubu to Tokyo)	The supply–demand status may degrade without power exchanges through cross-regional interconnection lines because of supply capacity shortage in TEPCO PG area due to demand growth caused by higher temperature more than forecasted.

Table 2-13: Actual employment of the transmission margin (FY 2015–FY 2024)

[days]

FY	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Nationwide	1	0	3	15	1	16	7	6	1	1

Table 2-14: Actual expansion of the transmission margin (FY 2015–FY 2024)

[days]

FY	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Nationwide	0	0	0	0	0	6	0	3	0	0

8. Actual Constraints on Cross-Regional Interconnection Lines Nationwide

ATC on cross-regional interconnected line is as published by each GT&D company. Please see the links below.

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* Regarding to ATC, map of each area is published on the websites below (in Japanese only).

Hokkaido Electric Power Network, Inc.:
http://www.hepco.co.jp/network/con_service/public_document/bid_info.html
Tohoku Electric Power Network Co., Inc.:
https://nw.tohoku-epco.co.jp/consignment/system/announcement/
TEPCO Power Grid, Incorporated:
https://www.tepco.co.jp/pg/consignment/system/index-j.html
Chubu Electric Power Grid Co., Inc.:
https://powergrid.chuden.co.jp/takuso_service/hatsuden_kouri/takuso_kyokyu/rule/map/
Hokuriku Electric Power Transmission & Distribution Company:
https://www.rikuden.co.jp/nw_notification/U_154seiyaku.html#akiyouryu
Kansai Transmission and Distribution, Inc.:
https://www.kansai-td.co.jp/consignment/disclosure/distribution-equipment/index.html
Chugoku Electric Power Transmission & Distribution Company, Incorporated:
https://www.energia.co.jp/nw/service/retailer/keitou/access/
Shikoku Electric Power Transmission & Distribution Company, Incorporated:
https://www.yonden.co.jp/nw/line_access/index.html
Kyushu Electric Power Transmission & Distribution Co., Inc.:
https://www.kyuden.co.jp/td_service_wheeling_rule-document_disclosure
The Okinawa Electric Power Company Incorporated:
http://www.okiden.co.jp/business-support/service/rule/plan/index.html

<Reference> Details of Actual Power Exchange Instructions and, Instructions and Requests to Generation Companies and Retail Companies Issued by the Oraganization.

The details of the actual power exchange instructions issued by the Organization in FY 2024 are listed below.

Actual power exchange instructions by the Organization

1	Issued at	6:31 on June 1, 2024
	Instruction	・Kansai T&D shall supply 142 MW of electricity at most to Chubu PG from 10:00 to 11:00 on June 1. ・Chubu PG shall be supplied 142 MW of electricity by Kansai T&D from 10:00 to 11:00 on June 1.
	Background	The supply–demand status may degrade without power exchanges through cross-regional interconnection lines because of the insufficient ability to reduce the power supply in the regional service area of Kansai T&D due to expected lower demand and higher renewable energy generation.
2	Issued at	7:40 on June 1, 2024
	Instruction	・Kansai T&D shall supply 739 MW of electricity at most to Chubu PG and Chugoku Network from 11:00 to 15:00 June 1. ・Chubu PG shall be supplied 739 MW of electricity at most by Kansai T&D from 11:00 to 15:00 on June 1. ・Chugoku Network shall be supplied 39 MW of electricity at most by Kansai T&D from 11:00 to 15:00 on June 1.
	Background	The supply–demand status may degrade without power exchanges through cross-regional interconnection lines because of the insufficient ability to reduce the power supply in the regional service area of Kansai T&D due to expected lower demand and higher renewable energy generation.
3	Issued at	5:47 on June 2, 2024
	Instruction	・Kansai T&D shall supply 625 MW of electricity at most to Chugoku Network from 9:30 to 11:00 June 2. ・Chugoku Network shall be supplied 625 MW of electricity at most by Kansai T&D from 9:30 to 11:00 on June 2.
	Background	The supply–demand status may degrade without power exchanges through cross-regional interconnection lines because of the insufficient ability to reduce the power supply in the regional service area of Kansai T&D due to expected lower demand and higher renewable energy generation.
4	Issued at	6:24 on June 2, 2024
	Instruction	・Kansai T&D shall supply 718 MW of electricity to Chugoku Network from 11:00 to 14:30 on June 2. ・Chugoku Network shall be supplied 718 MW of electricity by Kansai T&D from 11:00 to 14:30 on June 2.
	Background	The supply–demand status may degrade without power exchanges through cross-regional interconnection lines because of the insufficient ability to reduce the power supply in the regional service area of Kansai T&D due to expected lower demand and higher renewable energy generation.
5	Issued at	17:23 on June 11, 2024
	Instruction	・TEPCO PG shall supply 300 MW of electricity at most to Tohoku Network from 18:00 to 19:00 on June 11. ・Tohoku Network shall be supplied 300 MW of electricity at most by TEPCO PG from 18:00 to 19:00 on June 11.
	Background	The supply–demand status may degrade without power exchanges through the cross-regional interconnection lines because of a shortage of supply capacity in the regional service area of Tohoku Network due to higher temperature more than expected.
6	Issued at	16:08 on June 12, 2024
	Instruction	・TEPCO PG shall supply 300 MW of electricity at most to Tohoku Network from 17:30 to 19:00 on June 12. ・Tohoku Network shall be supplied 300 MW of electricity at most by TEPCO PG from 17:30 to 19:00 on June 12.
	Background	The supply–demand status may degrade without power exchanges through the cross-regional interconnection lines because of a shortage of supply capacity in the regional service area of Tohoku Network due to demand growth more than expected and lower output from renewable energy generation triggered by bad weather.
7	Issued at	16:58 on June 12, 2024
	Instruction	・TEPCO PG shall supply 300 MW of electricity to Tohoku Network from 17:30 to 19:00 on June 12. ・Tohoku Network shall be supplied 300 MW of electricity by TEPCO PG from 17:30 to 19:00 on June 12.
	Background	The supply–demand status may degrade without power exchanges through the cross-regional interconnection lines because of a shortage of supply capacity in the regional service area of Tohoku Network due to demand growth more than expected and lower output from renewable energy generation triggered by bad weather.

8	Issued at	14:03 on June 13, 2024
	Instruction	・TEPCO PG shall supply 550 MW of electricity at most to Tohoku Network from 15:30 to 17:00 on June 13. ・Tohoku Network shall be supplied 550 MW of electricity at most by TEPCO PG from 15:30 to 17:00 on June 13.
	Background	The supply–demand status may degrade without power exchanges through the cross-regional interconnection lines because of a shortage of supply capacity in the regional service area of Tohoku Network due to demand growth more than expected triggered by higher temperature.
9	Issued at	15:55 on June 13, 2024
	Instruction	・TEPCO PG shall supply 500 MW of electricity at most to Tohoku Network from 17:00 to 20:00 on June 13. ・Tohoku Network shall be supplied 500 MW of electricity at most by TEPCO PG from 17:00 to 20:00 on June 13.
	Background	The supply–demand status may degrade without power exchanges through the cross-regional interconnection lines because of a shortage of supply capacity in the regional service area of Tohoku Network due to demand growth more than expected triggered by higher temperature.
10	Issued at	12:17 on June 21, 2024
	Instruction	・TEPCO PG shall supply 850 MW of electricity at most to Tohoku Network from 13:00 to 16:30 on June 21. ・Tohoku Network shall be supplied 850 MW of electricity at most by TEPCO PG from 13:00 to 16:30 on June 21.
	Background	The supply–demand status may degrade without power exchanges through the cross-regional interconnection lines because of a shortage of supply capacity in the regional service area of Tohoku Network due to lower solar power generation more than expected triggered by bad weather.
11	Issued at	13:26 on June 21, 2024
	Instruction	・TEPCO PG shall supply 250 MW of electricity to Tohoku Network from 14:00 to 14:30 on June 21. ・Tohoku Network shall be supplied 250 MW of electricity by TEPCO PG from 14:00 to 14:30 on June 21.
	Background	The supply–demand status may degrade without power exchanges through the cross-regional interconnection lines because of a shortage of supply capacity in the regional service area of Tohoku Network due to lower solar power generation more than expected triggered by bad weather.
12	Issued at	15:55 on July 5, 2024
	Instruction	・TEPCO PG shall supply 550 MW of electricity at most to Kansai T&D from 17:30 to 19:00 on July 5. ・Chubu PG shall supply 247 MW of electricity to Kansai T&D from 18:30 to 19:00 on July 5. ・Hokuriku T&D shall supply 140 MW of electricity at most to Kansai T&D from 17:00 to 19:00 on July 5. ・Chugoku Network shall supply 450 MW of electricity at most to Kansai T&D from 16:30 to 19:00 on July 5. ・Kyushu T&D shall supply 240 MW of electricity to Kansai T&D from 17:30 to 18:00 on July 5. ・Kansai T&D shall be supplied 1380 MW of electricity by TEPCO PG, Chubu PG, Hokuriku T&D, Chugoku Network, and Kyushu T&D from 16:30 to 19:00 on July 5.
	Background	The supply–demand status may degrade without power exchanges through the cross-regional interconnection lines because of a shortage of supply capacity in the regional service area of Kansai T&D due to demand growth more than expected and decrease of balancing capacity triggered by maintenance work schedule change.
13	Issued at	17:07 on July 5, 2024
	Instruction	・TEPCO PG shall supply 150 MW of electricity to Kansai T&D from 18:00 to 18:30 on July 5. ・Kansai T&D shall be supplied 150 MW of electricity by TEPCO PG from 18:00 to 18:30 on July 5.
	Background	The supply–demand status may degrade without power exchanges through the cross-regional interconnection lines because of a shortage of supply capacity in the regional service area of Kansai T&D due to demand growth more than expected and decrease of balancing capacity triggered by maintenance work schedule change.
14	Issued at	8:43 on July 8, 2024
	Instruction	・Chubu PG shall supply 200 MW of electricity to TEPCO PG from 9:00 to 12:00 on July 8. ・TEPCO PG shall be supplied 200 MW of electricity by Chubu PG from 9:00 to 12:00 on July 8.
	Background	The supply–demand status may degrade because of a shortage of supply capacity in the regional service area of TEPCO PG due to demand growth more than expected triggered by higher temperature.
15	Issued at	17:33 on July 8, 2024
	Instruction	・Chubu PG shall supply 360 MW of electricity to Kansai T&D from 18:00 to 19:00 on July 8. ・Kansai T&D shall be supplied 360 MW of electricity by Chubu PG from 18:00 to 19:00 on July 8.
	Background	The supply–demand status may degrade because of a shortage of supply capacity in the regional service area of Kansai T&D due to demand growth more than expected triggered by higher temperature.

16	Issued at	17:05 on August 21, 2024
	Instruction	・Kansai T&D shall supply 350 MW of electricity at most to KyushuT&D from 18:00 to 19:30 on July 8. ・Chugoku Network shall supply 100 MW of electricity at most to KyushuT&D from 19:00 to 19:30 on July 8. ・Kyushu T&D shall be supplied 350 MW of electricity at most by Kansai T&D, and Chugoku Network from 18:00 to 19:30 on July 8.
	Background	The supply–demand status may degrade because of a shortage of supply capacity in the regional service area of Kyushu T&D due to generator shutdown.
17	Issued at	17:01 on August 23, 2024
	Instruction	・TEPCO PG shall supply 250 MW of electricity at most to Tohoku Network from 18:00 to 19:30 on August 23. ・Tohoku Network shall be supplied 250 MW of electricity at most by TEPCO PG from 18:00 to 19:30 on August 23.
	Background	The supply–demand status may degrade because of a shortage of supply capacity in the regional service area of Tohoku Network due to demand growth more than expected triggered by higher temperature.
18	Issued at	12:40 on August 26, 2024
	Instruction	・Chubu PG shall supply 410 MW of electricity to KansaiT&D from 13:00 to 14:00 on August 26. ・Kansai T&D shall be supplied 410 MW of electricity by Chubu PG from 13:00 to 14:00 on August 26.
	Background	The supply–demand status may degrade because of a shortage of supply capacity in the regional service area of Kansai T&D due to demand growth more than expected triggered by higher temperature, and generator shutdown.
19	Issued at	13:44 on August 26, 2024
	Instruction	・Chubu PG shall supply 1100 MW of electricity at most to KansaiT&D from 14:00 to 17:00 on August 26. ・Kansai T&D shall be supplied 1100 MW of electricity at most by Chubu PG from 14:00 to 17:00 on August 26.
	Background	The supply–demand status may degrade because of a shortage of supply capacity in the regional service area of Kansai T&D due to demand growth more than expected triggered by higher temperature, and generator shutdown.
20	Issued at	13:44 on August 26, 2024
	Instruction	・Chubu PG shall supply 490 MW of electricity at most to KansaiT&D from 17:00 to 20:00 on August 26. ・Kansai T&D shall be supplied 490 MW of electricity at most by Chubu PG from 17:00 to 20:00 on August 26.
	Background	The supply–demand status may degrade because of a shortage of supply capacity in the regional service area of Kansai T&D due to demand growth more than expected triggered by higher temperature, and generator shutdown.
21	Issued at	15:42 on September 11, 2024
	Instruction	・Chubu PG shall supply 300 MW of electricity to TEPCO PG from 16:30 to 17:00 on September 11. ・TEPCO PG shall be supplied 300 MW of electricity by Chubu PG from 16:30 to 17:00 on September 11.
	Background	The supply–demand status may degrade because of a shortage of supply capacity in the regional service area of TEPCO PG due to demand growth more than expected triggered by higher temperature.
22	Issued at	16:48 on September 11, 2024
	Instruction	・Hokkaido Network shall supply 5.9 MW of electricity at most to Tohoku Network from 17:30 to 19:00 on September 11. ・TEPCO PG shall supply 333.5 MW of electricity to Tohoku Network from 17:30 to 18:00 on September 11. ・Hokuriku T&D shall supply 114 MW of electricity at most to Tohoku Network from 17:30 to 19:00 on September 11. ・Kansai T&D shall supply 209.1 MW of electricity at most to Tohoku Network from 18:00 to 19:00 on September 11. ・Tohoku Network shall be supplied 450 MW of electricity at most by Hokkaido Network, TEPCO PG, Hokuriku T&D, and Kansai T&D from 17:30 to 19:00 on September 11.
	Background	The supply–demand status may degrade because of a shortage of supply capacity in the regional service area of Tohoku Network due to demand growth more than expected triggered by higher temperature.
23	Issued at	15:30 on September 12, 2024
	Instruction	・Chubu PG shall supply 500 MW of electricity to TEPCO PG from 16:30 to 17:00 on September 12. ・TEPCO PG shall be supplied 500 MW of electricity by Chubu PG from 16:30 to 17:00 on September 12.
	Background	The supply–demand status may degrade because of a shortage of supply capacity in the regional service area of TEPCO PG due to demand growth more than expected triggered by higher temperature.

24	Issued at	16:37 on September 12, 2024
	Instruction	・Chubu PG shall supply 420 MW of electricity at most to KansaiT&D from 17:30 to 18:30 on September 12. ・Kansai T&D shall be supplied 420 MW of electricity at most by Chubu PG from 17:30 to 18:30 on September 12.
	Background	The supply–demand status may degrade because of a shortage of supply capacity in the regional service area of Kansai T&D due to demand growth more than expected triggered by higher temperature.
25	Issued at	15:06 on September 17, 2024
	Instruction	・Chubu PG shall supply 690 MW of electricity at most to KansaiT&D from 16:00 to 18:30 on September 17. ・Kansai T&D shall be supplied 690 MW of electricity at most by Chubu PG from 16:00 to 18:30 on September 17.
	Background	The supply–demand status may degrade because of a shortage of supply capacity in the regional service area of Kansai T&D due to demand growth more than expected triggered by higher temperature.
26	Issued at	16:49 on September 17, 2024
	Instruction	・Chubu PG shall supply 100 MW of electricity at most to KansaiT&D from 17:30 to 18:30 on September 17. ・Shikoku T&D shall supply 440 MW of electricity at most to KansaiT&D from 17:30 to 18:30 on September 17. ・Kansai T&D shall be supplied 540 MW of electricity at most by Chubu PG from 17:30 to 18:30 on September 17.
	Background	The supply–demand status may degrade because of a shortage of supply capacity in the regional service area of Kansai T&D due to demand growth more than expected triggered by higher temperature.
27	Issued at	15:37 on September 18, 2024
	Instruction	・Tohoku Network shall supply 329 MW of electricity to Kansai T&D from 16:00 to 16:30 on September 18. ・TEPCO PG shall supply 410 MW of electricity to Kansai T&D from 16:30 to 17:00 on September 18. ・Chubu PG shall supply 380 MW of electricity at most to Kansai T&D from 16:30 to 18:30 on September 18. ・Hokuriku T&D shall supply 300 MW of electricity to Kansai T&D from 16:00 to 17:00 on September 18. ・Chugoku Network shall supply 750 MW of electricity at most to Kansai T&D from 16:00 to 18:30 on September 18. ・Shikoku T&D shall supply 300 MW of electricity at most to Kansai T&D from 16:00 to 17:00 on September 18. ・Kansai T&D shall be supplied 1410 MW of electricity at most by Tohoku Network, TEPCO PG, Chubu PG, Hokuriku T&D, Chugoku Network, and Shikoku T&D from 16:00 to 18:30 on September 18.
	Background	The supply–demand status may degrade because of a shortage of supply capacity in the regional service area of Kansai T&D due to demand growth more than expected triggered by higher temperature.
28	Issued at	15:06 on September 19, 2024
	Instruction	・TEPCO PG shall supply 270 MW of electricity to Kansai T&D from 16:30 to 17:00 on September 19. ・Hokuriku T&D shall supply 350 MW of electricity at most to Kansai T&D from 16:00 to 18:00 on September 19. ・Chugoku Network shall supply 410 MW of electricity at most to Kansai T&D from 15:30 to 16:30 on September 19. ・Shikoku T&D shall supply 250 MW of electricity at most to Kansai T&D from 16:30 to 18:00 on September 19. ・Kansai T&D shall be supplied 870 MW of electricity at most by TEPCO PG, Hokuriku T&D, Chugoku Network, and Shikoku T&D from 15:30 to 18:00 on September 19.
	Background	The supply–demand status may degrade because of a shortage of supply capacity in the regional service area of Kansai T&D due to demand growth more than expected triggered by higher temperature.
29	Issued at	15:24 on September 19, 2024
	Instruction	・TEPCO PG shall supply 300 MW of electricity to Chubu PG from 16:00 to 16:30 on September 19. ・Chubu PG shall be supplied 300 MW of electricity by TEPCO PG from 16:00 to 16:30 on September 19.
	Background	The supply–demand status may degrade because of a shortage of supply capacity in the regional service area of Chubu PG due to lower solar power generation more than expected triggered by bad weather.
30	Issued at	16:30 on September 20, 2024
	Instruction	・Chubu PG shall supply 210 MW of electricity to KansaiT&D from 17:30 to 18:00 on September 20. ・Kansai T&D shall be supplied 210 MW of electricity by Chubu PG from 17:30 to 18:00 on September 20.
	Background	The supply–demand status may degrade because of a shortage of supply capacity in the regional service area of Kansai T&D due to demand growth more than expected triggered by higher temperature.
31	Issued at	14:34 on October 2, 2024
	Instruction	・TEPCO PG shall supply 550 MW of electricity at most to Tohoku Network from 15:30 to 18:30 on October 2. ・Chubu PG shall supply 300 MW of electricity to Tohoku Network from 16:30 to 17:00 on October 2. ・Tohoku Network shall be supplied 550 MW of electricity at most by TEPCO PG, and Chubu PG from 15:30 to 18:30 on October 2.
	Background	The supply–demand status may degrade because of a shortage of supply capacity in the regional service area of Tohoku Network due to demand growth more than expected triggered by higher temperature.

32	Issued at	12:37 on October 17, 2024
	Instruction	・Kansai T&D shall supply 540 MW of electricity at most to KyushuT&D from 14:00 to 17:00 on October 17. ・Chugoku Network shall supply 740 MW of electricity at most to KyushuT&D from 13:30 to 17:30 on October 17. ・Kyushu T&D shall be supplied 950 MW of electricity by Kansai T&D, and Chugoku Network from 13:30 to 17:30 on October 17.
	Background	The supply–demand status may degrade because of a shortage of supply capacity in the regional service area of Kyushu T&D due to demand growth more than expected triggered by higher temperature, and decrease of solar power output caused by bad weather.
33	Issued at	7:32 on November 3, 2024 [9:46 on November 3; Actual supply was avoided due to change of supply–demand condition]
	Instruction	・Kansai T&D shall supply 78 MW of electricity to HokurikuT&D from 10:30 to 11:00 on November 3. ・Hokuriku T&D shall be supplied 78 MW of electricity by Kansai T&D from 10:30 to 11:00 on November 3.
	Background	The supply–demand status may degrade because of the insufficient ability to reduce the power supply in the regional service area of Kansai T&D due to expected lower demand and higher renewable energy generation.
34	Issued at	14:03 on March 15, 2025
	Instruction	・Kansai T&D shall supply 160 MW of electricity to Hokuriku T&D from 14:30 to 16:30 on March 15. ・Hokuriku T&D shall be supplied 160 MW of electricity by Kansai T&D from 14:30 to 16:30 on March 15.
	Background	The supply–demand status may degrade because of a shortage of supply capacity in the regional service area of Hokuriku T&D due to demand growth more than expected and lower solar power generation triggered by bad weather.

Actual Instructions and Requests to Generation Companies and Retail Companies by the Organization

[1]	Issued on	July 8, 2024
	Background	Cross-regional reserve margin for the TEPCO PG area is forecasted to be below 5% on July 8 due to cooling demand growth triggered by heatwave. To cope with the condition, the Organization requests the members to implement measures for improving the supply–demand condition stated below.
	Period	July 8 (* above request is made for time slots till 22:00, when tight supply–demand is expected.)
	Requested Items	(1) Generator or private power installation, which is owned by the member or procured power from other entity by power purchase contract (including economic demand reduction [DR]), it shall generate electricity in increased capacity as possible in TEPCO PG area. However, if the generator has other power purchase contracts with other retail companies, such contracts will be prioritized, and generation increase will be implemented to the extent possible. (2) Each retail company must reduce its demand to the extent possible by the agreed economic DR contract or power-saving request to its customer. However, if there is a bilateral contract with other electric power suppliers, such a contract will be prioritized, and demand reduction will be implemented to the extent possible. (3) Surplus power provided by the additional generation or DR shall be traded in the intraday market. If such power has a bilateral contract with retail company (including economic DR contract), delivery or demand reduction shall be implemented by such a contract. Clearing shall be implemented according to the market rule or the bilateral contract.
	Additional Notice	・For correspondence to the aforementioned request, life safety shall be prioritized, particularly operational safety and compliance with laws and ordinances. ・Please comply with the corresponding regulatory direction for operating generators, which is deemed an environmental regulation. ・The Organization shall not be liable to the cost (including imbalance cost) or loss incurred by responding to the aforementioned request.
[2]	Issued on	July 29, 2024
	Background	Cross-regional reserve margin for the TEPCO PG area is forecasted to be below 5% on July 29 due to cooling demand growth triggered by heatwave. To cope with the condition, the Organization requests the members to implement measures for improving the supply–demand condition stated below.
	Period	July 29, from 11:00 to 21:30
	Requested Items	(1) Generator or private power installation, which is owned by the member or procured power from other entity by power purchase contract (including economic demand reduction [DR]), it shall generate electricity in increased capacity as possible in TEPCO PG area. However, if the generator has other power purchase contracts with other retail companies, such contracts will be prioritized, and generation increase will be implemented to the extent possible. (2) Surplus power provided by the additional generation shall be traded in the intraday market. If such power has a bilateral contract with retail company, delivery shall be implemented by such a contract. Clearing shall be implemented according to the market rule or the bilateral contract.
	Additional Notice	・For correspondence to the aforementioned request, life safety shall be prioritized, particularly operational safety and compliance with laws and ordinances. ・Please comply with the corresponding regulatory direction for operating generators, which is deemed an environmental regulation. ・The Organization shall not be liable to the cost (including imbalance cost) or loss incurred by responding to the aforementioned request.

[3]	Issued on	July 30, 2024
	Background	Cross-regional reserve margin for the TEPCO PG area is forecasted to be below 5% on July 29 due to cooling demand growth triggered by heatwave. To cope with the condition, the Organization requests the members to implement measures for improving the supply–demand condition stated below.
	Period	July 30, from 9:30 to 17:00
	Requested Items	(1) Generator or private power installation, which is owned by the member or procured power from other entity by power purchase contract (including economic demand reduction [DR]), it shall generate electricity in increased capacity as possible in TEPCO PG area. However, if the generator has other power purchase contracts with other retail companies, such contracts will be prioritized, and generation increase will be implemented to the extent possible. (2) Surplus power provided by the additional generation shall be traded in the intraday market. If such power has a bilateral contract with retail company, delivery shall be implemented by such a contract. Clearing shall be implemented according to the market rule or the bilateral contract.
	Additional Notice	・For correspondence to the aforementioned request, life safety shall be prioritized, particularly operational safety and compliance with laws and ordinances. ・Please comply with the corresponding regulatory direction for operating generators, which is deemed an environmental regulation. ・The Organization shall not be liable to the cost (including imbalance cost) or loss incurred by responding to the aforementioned request.
[4]	Issued on	September 20, 2024
	Background	Demand growth due to heatwave is expected in the areas of GT&D companies such as Tokyo, Chubu, Hokuriku, Kansai, Chugoku, Shikoku, and Kyushu. To cope with the condition, the Organization requests the members who own private power installation to increase generation for securing stable supply as below stated manners. Additionally, the Organization also requests to electric power suppliers who are not its members to implement measures for understanding the condition and improving the supply–demand condition.
	Period	September 20, from 16:00 to 17:00
	Requested Items	(1) For private power installation which is owned or operated by the member, it shall generate electricity in increased capacity to the extent possible in above stated areas. (2) When the subjected member is a member of Japan Electric Power eXchange (JEPX), surplus power provided by the installation shall be traded in the intraday market of the JEPX to the extent possible. Besides, increased generation shall be kept even though in case of uncontracted biddking.
	Additional Notice	・For correspondence to the aforementioned request, life safety shall be prioritized, particularly operational safety and compliance with laws and ordinances. ・Please comply with the corresponding regulatory direction for operating generators, which is deemed an environmental regulation. ・The Organization shall not be liable to the cost (including imbalance cost) or loss incurred by responding to the aforementioned request.

Actual Requests to GT&D Companies for Maintenance Work Schedule Alteration by the Organization

[1]	Issued on	September 13, 2024
	Requested Items	Cross-regional reserve margin for TEPCO PG area is forecasted to decrease on September 17 and 18. The Organization publishes that it has requested to TEPCO PG for maintenance work schedule alteration in its service area to improve supply–demand condition according to the provisions of Paragraph 1 of Article 112 of the Operational Rules of the Organization. Generation company subject to the schedule alteration shall be requested the cancellation of maintenance work of generation facility which the company owns or operates based on the request from TEPCO PG. * Please keep watching the latest information as there is possibility of more tight supply–demand forecast due to weather condition.
	Area	TEPCO PG area
	Period	September 17, 18
[2]	Issued on	September 17, 2024
	Requested Items	Summer period of fiscal year 2024 is unusually prolonged in nationwide. Due to lingering summer heat, demand growth is epected in September 19 and 20. Under the circumstance of increasing generator maintenance work for coming winter, especially, TEPCO PG area is forecased to decrease cross-regional reserve margin. Thus, the Organization publishes that it has requested to TEPCO PG in advance for maintenance work schedule alteration in its service area to improve supply–demand condition according to the provisions of Paragraph 1 of Article 112 of the Operational Rules of the Organization. Generation company subject to the schedule alteration shall be requested the cancellation of maintenance work of generation facility which the company owns or operates based on the request from TEPCO PG.
	Area	TEPCO PG area
	Period	September 19, 20

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